BUREAU OF RECLAMATION

Draft Environmental Assessment

Babbitt Ranch Energy Center Interconnection Project, Arizona
Interior Region 8: Lower Colorado Basin

U.S. Department of the Interior
Bureau of Reclamation
Interior Region 8: Lower Colorado Basin
Phoenix Area Office
Glendale, Arizona

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Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Acronyms and Abbreviations

AADT	AVERAGE ANNUAL DAILY TRAFFIC
ADA	ARIZONA DEPARTMENT OF AGRICULTURE
ADOT	ARIZONA DEPARTMENT OF TRANSPORTATION
AGFD	ARIZONA GAME AND FISH DEPARTMENT
APS	ARIZONA PUBLIC SERVICE
ASLD	ARIZONA STATE LAND DEPARTMENT
BGEPA	BALD AND GOLDEN EAGLE PROTECTION ACT
BMP	BEST MANAGEMENT PRACTICE
BREC	BABBITT RANCH ENERGY CENTER
CEAA	CUMULATIVE EFFECTS ANALYSIS AREA
CFR	CODE OF FEDERAL REGULATIONS
CUP	CONDITIONAL USE PERMIT
CWA	CLEAN WATER ACT
DB	DECIBEL(S)
DBA	A-WEIGHTED DECIBELS
DOI	DEPARTMENT OF THE INTERIOR
EA	ENVIRONMENTAL ASSESSMENT
EPA	U.S. ENVIRONMENTAL PROTECTION AGENCY
FAA	FEDERAL AVIATION ADMINISTRATION
FOREST PLAN	LAND AND RESOURCE MANAGEMENT PLAN FOR THE KAIBAB NATIONAL FOREST (2014)
FOREST SERVICE	U.S. FOREST SERVICE
GEN-TIE	GENERATION-TIE
HUC	HYDROLOGIC UNIT CODE
IPAC	INFORMATION FOR PLANNING AND CONSULTATION
KV	KILOVOLT(S)
LDN	DAY-NIGHT AVERAGE SOUND LEVEL
LGIA	LARGE GENERATOR INTERCONNECTION AGREEMENT
MBTA	MIGRATORY BIRD TREATY ACT
MPH	MILES PER HOUR
MW	MEGAWATT(S)
NEER	NEXTERA ENERGY RESOURCES, LLC
NEPA	NATIONAL ENVIRONMENTAL POLICY ACT
NF	NATIONAL FOREST
NFS	NATIONAL FOREST SYSTEM
NHD	NATIONAL HYDROGRAPHY DATASET
NHPA	NATIONAL HISTORIC PRESERVATION ACT
NRHP	NATIONAL REGISTER OF HISTORIC PLACES
NSTS	NAVAJO SOUTHERN TRANSMISSION SYSTEM
NWI	NATIONAL WETLANDS INVENTORY
OHWM	ORDINARY HIGH-WATER MARK
PFYC	POTENTIAL FOSSIL YIELD CLASSIFICATION
PL	PUBLIC LAW

PROJECT	BABBITT RANCH ENERGY CENTER INTERCONNECTION
PROJECT PROPONENT	BABBITT RANCH ENERGY CENTER, LLC
RECLAMATION	U.S. BUREAU OF RECLAMATION
ROW	RIGHT-OF-WAY
SCE	SOUTHERN CALIFORNIA EDISON
SHPO	STATE HISTORIC PRESERVATION OFFICE
SIO	SCENIC INTEGRITY OBJECTIVE
SPCC	SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN
SR	STATE ROUTE
SUP	SPECIAL USE PERMIT
SWCA	SWCA ENVIRONMENTAL CONSULTANTS
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
U.S. 180	U.S. ROUTE 180
USACE	U.S. ARMY CORPS OF ENGINEERS
USFWS	U.S. FISH AND WILDLIFE SERVICE

TABLE OF CONTENTS

List of Appendices

List of Figures

List of Tables

1.0 Introduction, Background, Purpose, and Need

1.1 INTRODUCTION

Babbitt Ranch Energy Center, LLC (Proponent), a subsidiary of NextEra Energy Resources, LLC (NEER), is proposing to interconnect the Babbitt Ranch Energy Center (BREC) to the Navajo Southern Transmission System (NSTS) at the Moenkopi to Cedar Mountain 500-kilovolt (kV) transmission line (referred to as the Babbitt Ranch Energy Center Interconnection Project [BREC Interconnection Project, or Project]). The generation point of interconnection on the Moenkopi to Cedar Mountain 500-kV transmission line is located on private lands approximately 30 miles northwest of Flagstaff in unincorporated Coconino County, Arizona (Figure 1). The BREC Interconnection Project is a component of the BREC, which is a large generator, renewable energy project located on nearby private land and lands managed by the Arizona State Land Department (ASLD; see Section 1.2, Background). The BREC Interconnection Project also includes a fiber-optic line that crosses a portion of the Kaibab National Forest (NF). Figure 2 and Figure 3 illustrate the BREC Interconnection Project (e.g., switchyard, substation, access roads, and fiber-optic line).

The Moenkopi to Cedar Mountain 500-kV transmission line is part of the NSTS, of which the U.S. Bureau of Reclamation (Reclamation) is a part owner and Arizona Public Service (APS) is the operator. All interconnection requests for the NSTS that result in a Large Generator Interconnection Agreement (LGIA) must be submitted to APS and approved by the owners of the transmission line, including the Regional Director of Reclamation's Lower Colorado Basin Region. Prior to the Regional Director's approval, Reclamation must complete an environmental review of the proposed interconnection in compliance with the National Environmental Policy Act of 1969 (NEPA) (Public Law [PL] 91-190). Reclamation, as the lead federal agency, is preparing this environmental assessment (EA) for the proposed BREC Interconnection Project to assess the environmental effects of the proposed interconnection.

The BREC Interconnection Project includes a proposed approximately 25-mile-long fiber-optic communication line that would cross approximately 8.95 miles of the Williams Ranger District of the Kaibab NF; therefore, the U.S. Forest Service (Forest Service) is participating as a cooperating agency in the NEPA process. The installation and maintenance of the portions of fiber-optic line that fall within National Forest System (NFS) lands would require APS to obtain a Special Use Permit (SUP) from the Kaibab NF. The *Land and Resource Management Plan for the Kaibab National Forest* (Forest Plan) (Forest Service 2014a) guides Forest Service management in fulfilling its stewardship responsibilities to best meet the needs of the public for the present and into the future. The Forest Plan provides guidance for project and activity decision making, and the Kaibab NF must ensure that its actions are in accordance with the Forest Plan. The proposed activities occurring on NFS lands are a project implementing the Kaibab NF's Forest Plan and are not authorized by the Healthy Forest Restoration Act. Given this, the activities occurring on NFS lands

are subject to the pre-decisional administrative review process outlined in subparts A and B of 36 Code of Federal Regulations (CFR) 218.

1.2 BACKGROUND

The BREC Interconnection Project is part of the BREC, a renewable energy project, that consists of a proposed 161-megawatt (MW) wind energy facility, 60-MW photovoltaic solar energy facility, and a 60-MW energy (battery) storage facility, located on private and ASLD lands (see Figure 1). Total generation output of the BREC to the NSTS would not exceed 161 MW.

The private lands in the BREC are in what is commonly known as the Babbitt Ranch, which is a checkerboard of private and ASLD lands used primarily for cattle ranching. All solar and energy storage facilities would be built on private lands, while wind facilities would be on both private and ASLD lands. Lands to the south of the BREC are managed by the Coconino NF to the southeast and the Kaibab NF to the southwest. Kaibab NF lands are also located to the north (see Figure 1). The Navajo Nation reservation is located approximately 7 miles to the east.

The BREC Interconnection Project has a feasible non-federal interconnection option that could connect to the existing 500-kV transmission line owned by Southern California Edison (SCE) and would not include federal approval of an LGIA; thus, the energy center retains independent utility under NEPA. Interconnection of BREC to the SCE transmission line would not depend on Reclamation authorization and there would not be a fiber-optic corridor through NFS lands; thus, there would not be a connected action under NEPA. Therefore, the scope of analysis under review by Reclamation and the Forest Service in the EA is limited to the BREC Interconnection Project. This is further described in Section 2.2, No Action Alternative. The entire BREC is analyzed under cumulative impacts in Chapter 4.

The purpose of the BREC is to deliver renewable energy into the transmission grid in the southwestern United States. The BREC meets several objectives on the local, state, and federal levels, including the need for additional energy supplies to serve the region and the priority placed on meeting this need with clean, renewable energy. The Project would support the supply of renewable electric energy (as an alternative to new fossil fuel generation resources) to serve the electrical load requirements in Arizona and the southwestern United States. The Project would also support the BREC, a new utility-scale energy project that includes wind, solar, and battery storage.

1.3 PROJECT LOCATION

The BREC Interconnection Project is located in Coconino County, Arizona (see project area in Figure 1). The project area is located on approximately 361 acres of NFS lands, approximately 284 acres of private lands, and approximately 432 acres of ASLD lands, totaling approximately 1,077 acres.

Sections 21 and 15 of Township 26 North, Range 5 East are private lands. Sections 8, 10, 16, 18, 20, and 22 of Township 26 North, Range 5 East are ASLD lands.

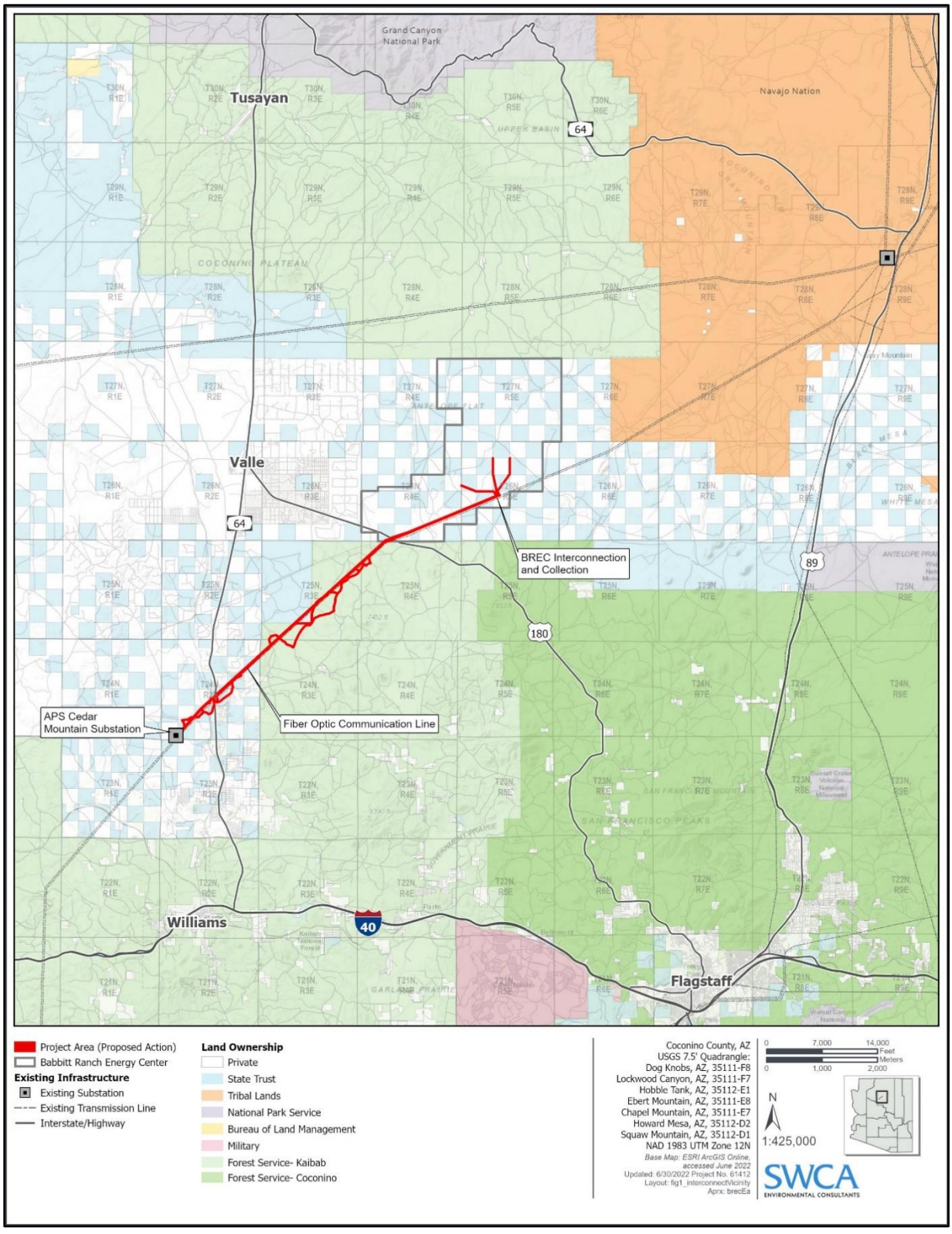

Figure 1. BREC Interconnection Project vicinity.

1.4 PURPOSE AND NEED

As owner of a share of the NSTS, Reclamation's purpose is to consider the large generator application for interconnection of the BREC to the NSTS at the Moenkopi to Cedar Mountain 500-kV transmission line. Reclamation's need for the action is to respond to Babbitt Ranch Energy Center LLC's application for an LGIA, in accordance with applicable laws and regulations described below, and, if appropriate, approve the LGIA.

Reclamation's need is based on the partial ownership of the NSTS by the U.S. government. The Navajo Generating Station and its associated transmission lines were authorized by the 1968 Colorado River Basin Project Act (PL 90-537, 82 Statute 885), and Reclamation manages the federal government's interests. Reclamation, along with the other owners, must approve the proposed interconnection into the NSTS.

Babbitt Ranch Energy Center, LLC, has applied to the operator (APS) of the Moenkopi to Cedar Mountain 500-kV transmission line to interconnect the BREC at the proposed interconnection location. The proposed action would deliver renewable energy from the BREC to the regional electrical grid via its interconnection to an APS line tap.

The Forest Service's purpose and need is to respond to APS's request for legal use and access across NFS lands by granting, if appropriate, an SUP and determining any measures needed to protect forest resources. The Kaibab NF would consider these requests in accordance with 36 CFR Part 251, Subpart B.

1.5 COOPERATING AGENCY

The Kaibab NF is a cooperating agency in preparation of the EA due to their jurisdiction by law and special expertise.

1.6 PUBLIC INVOLVEMENT AND AGENCY CONSULTATION

1.6.1 PUBLIC SCOPING AND TRIBAL CONSULTATION

Planning for the BREC Interconnection Project began in early 2021. The Project was published on the Forest Service Schedule of Proposed Actions on December 17, 2021. Reclamation began a 30-day public scoping period on June 8, 2022. As part of the public scoping process, public interest letters were mailed to neighboring residents, Native American Tribes, local, state, and federal agencies, and non-governmental organizations. A legal announcement requesting public input was published in the *Arizona Daily Sun* on June 8, 2022. Section 5.3, Agency Coordination and Tribal Consultation, details the agencies and Native American tribes contacted for public scoping.

Reclamation and Kaibab NF received eight comment letters during the 30-day scoping period. Letters were received from four public individuals, Western Watersheds Project, the U.S. Environmental Protection Agency (EPA), Arizona Department of Transportation (ADOT), Arizona

Game and Fish Department (AGFD), and Arizona State Historic Preservation Office (SHPO). Table 1 contains a summary of the public comments received during the scoping period.

Table 1. Summary of Public Scoping Comments

Topic	Comment Summary	Response
NEPA General	Comments included general comments about the NEPA process, questions about the proposed action, and recommendations for public involvement and continued communications. Comments requested that the EA clearly define the purpose and need; consider and analyze a full range of alternatives; present environmental impacts of the proposed action and alternatives in comparison format using the existing environmental conditions for the baseline of the analysis; and quantify impacts, including required mitigation.	The EA addresses the purpose and need (Chapter 1), defines the proposed action and alternatives (see Chapter 2) and resource impacts (see Chapter 3).
Proposed Action	Comments related to the proposed action requested that all utility work and installations within rights-of-way (ROWs) under ADOT jurisdiction acquire a permit prior to commencing work within the ROW. Separate encroachment permits will be required for all temporary and permanent access points to U.S. Route 180 and State Route 64. ADOT prefers installation of facilities crossing State Routes be done via horizontal directional drill method. Comments requested that access routes to State Highways be designed and constructed to accommodate vehicles that exceed legal size and hauling capacity.	The request for horizontal drilling method in ADOT ROW is included in the proposed action description in Chapter 2. Required encroachment permits are included in Section 5.1, Permits to be Acquired. Transportation impacts to State Highways are analyzed in Section 3.10, Transportation. The proposed action does not include design and access improvements to State Highways.

Topic	Comment Summary	Response
Mitigation	Comments requested that the EA include a suite of potential mitigation measures to be implemented to reduce significant adverse effects, especially those for wildlife and their habitat.	Detailed best management practices as directly related to the Project and potential impacts are incorporated in the proposed action to minimize and reduce Project impacts and are presented in Table 7.
Cumulative Impacts	Comments requested that the EA analyze connected actions and reasonably foreseeable environmental trends and planned actions in the area and identify how resources, ecosystems, and communities in the vicinity of the project area have already been, or will be, affected by past, present, or future activities.	Cumulative impacts are presented in Chapter 4.
Section 106 and Cultural Resources	Comments requested that government-to-government consultation under Section 106 and the National Historic Preservation Act, should take place early in the scoping process to ensure all issues are adequately addressed in the EA. Comments included a request that the EA include the results of tribal consultation and identify any concerns expressed by tribes, and how those concerns were addressed. The comments requested that the EA discuss how the Project would avoid or minimize adverse effects on the physical integrity, accessibility, or use of cultural resources or archaeological sites, including traditional cultural properties and Indian Sacred Sites (Executive Order 13007). Comments from the Arizona SHPO expressed interest in participating in the Section 106 process.	The tribal consultation and Section 106 process is described in Chapter 5. Cultural resource impacts are analyzed in Section 3.6, Cultural Resources.
General Wildlife	Comments requested that the EA identify and quantify direct, indirect, and cumulative impacts to wildlife species potentially affected by each alternative and include applicable mitigation measures.	General wildlife impacts are analyzed in Section 3.2, General Wildlife.

Topic	Comment Summary	Response
Special-Status Species	Comments included requests to identify and quantify plant and wildlife species classified rare, threatened, or endangered on either state or federal lists and migratory birds, potentially affected by each alternative, and include applicable mitigation measures. Requests included agencies work closely with U.S. Fish and Wildlife Service and AGFD to determine impacts on special-status species.	Special-status species impacts are analyzed in Sections 3.4, Special-Status Species: Forest Service Sensitive Plant Species and Habitat, and 3.5, Special-Status Species: Forest Service Sensitive Wildlife.
Invasive Species	Comments requested that the EA review invasive species and noxious weed current conditions and include noxious weed management measures and best management practices to prevent, detect, and control invasives in the project area.	Noxious weeds and invasive species are discussed in Table 7, Table 3, and in Section 3.1, Vegetation.
Land Use and Grazing	Comments requested the following related to land use and grazing: • identify livestock allotments in the project area and provide information such as acres, animal unit months (AUMs), and rangeland conditions. • offset long-term impacts of this Project on natural resources by voluntarily retiring livestock on allotments in and near the project area. • discuss how the Project relates to, and will be integrated with, federal, state, tribal, and local land use plans in the project area. • work with local property owners to confirm location and access for Project components including access and location of infrastructure in the vicinity (underground national defense cable).	Land use and grazing impacts are presented in Section 3.7, Land Use and Grazing. Offsetting long-term impacts of the proposed action by retiring livestock on Forest Service allotments is out of the scope of the analysis and proposed action of this EA.
Water Resources	Comments requested the EA discuss impacts to surface water and groundwater quality and quantity from the proposed Project activities and demonstrate compliance with EPA-approved water quality standards for the State of Arizona, potential mitigation measures with adaptive management monitoring programs, and consider current and future water needs in respective basins in the project area. Comments also included recommendations that the EA demonstrate compliance with the Clean Water Act Section 404 and Executive Order 11988 on Floodplain Management.	Water quality and water quantity are discussed in Table 3. Water resource impacts are presented in Section 3.12, Water Resources.

Topic	Comment Summary	Response
Environmental Justice	Comments requested that the EA address impacts to minority and/or low-income communities (i.e., Environmental Justice) under Executive Order 12898, and determine if such communities are disproportionately affected by the proposed action or alternatives, through toxins, changes in resources or access, cumulative or multiple adverse exposures from environmental hazards, or community disruption.	Environmental justice is discussed in Table 3.
Climate Change	Comments requested that the EA include a discussion of reasonably foreseeable climate change impacts in the project area—such as changes in precipitation patterns, hydrology, vegetation distribution in respective watersheds, and temperature—and the potential effect of these impacts on resources to help inform the development of measures to improve the resilience of the Project.	Climate change is discussed in Table 3.
Air Quality	Comments suggested the EA should provide a discussion of ambient air conditions (baseline or existing), National Ambient Air Quality Standards (NAAQS) and nonattainment areas, and potential air quality impacts for each alternative. In estimating criteria pollutant emissions for the analysis area, discuss the time frame for release of these emissions for the duration of the proposed Project activities. Comments also included recommended best management practices for inclusion in the EA.	Air quality impacts are discussed in Table 3 and in Table 7.
General Support	The proposed action aligns with past planning efforts between NextEra and Clēnera and the AGFD regarding renewable energy projects on Babbitt Ranches.	Thank you for your comment.

1.6.2 ISSUES

Reclamation and the Forest Service developed a list of preliminary issues to address in the EA using comments from the public, agencies, and the internal interdisciplinary teams. The preliminary issues were separated into issues carried forward for detailed analysis (Table 2) and issues that do not require detailed analysis to address potential environmental effects (Table 3). The resource issues evaluated in detail and the effect indicators used to assess effects of the proposed action and no action alternative are presented in Table 2. The preliminary resource issues that were not analyzed in further detail in the EA and the analysis rationale are discussed in Table 3. These resource issues were evaluated and determined to either be not affected or minimally affected with implementation of best management practices (BMPs), as summarized in Table 7.Table 7

Table 2. Resource Issues Carried Forward for Detailed Analysis in the EA

Resource	Analysis Issue	Effect Indicator
Biological Resources		
Vegetation	How would ground disturbance during construction and operations affect vegetation cover and existing vegetation habitat?	Acres of vegetation (by type) disturbed (temporary and long term/permanent)
General Wildlife	How would vegetation removal and increased noise during proposed construction activities impact wildlife species and wildlife habitat within the proposed project area?	Acres of temporary and permanent disturbance compared to habitat in project area; timing and length of human disturbances, including from equipment noise
Migratory Birds	How would vegetation removal and increased noise during proposed construction activities impact nesting birds, bald and golden eagles, and avian habitat within or near the proposed project area?	Acres of existing nesting habitat within Project boundary would be evaluated; acres of temporary and long-term disturbance; timing and length of human disturbances, including from equipment noise
Special-Status Species		
Forest Service Sensitive plant species and habitat	Would the Project (clearing habitat, fragmentation, roads, invasive weeds) result in special-status plant species population declines?	Acres of impact to suitable special-status plant species habitats (by type) and known or expected range and abundance of these species in the project area
Forest Service Sensitive Wildlife	How would vegetation removal, presence of equipment and workers, and increased noise during proposed construction activities impact Forest Service Sensitive wildlife species within the proposed project area?	Acres of temporary and permanent disturbance for species with the potential to occur in project area; timing of and length of human disturbances noise and duration, including equipment noise
Cultural Resources	How would the construction, operation, maintenance, and decommissioning of the Project affect cultural resources?	Number of identified historic properties indirectly/directly affected by the Project
Land Use and Grazing	How would the construction and operation of the Project affect existing and future land uses? Would the Project result in the permanent conversion of existing or future land uses?	Acres of public and/or private land use affected; changes in land use based on acreage; acreage of temporary and permanent vegetation disturbance within grazing allotments

Resource	Analysis Issue	Effect Indicator
Noise	How would noise generated by construction and operation of the Project affect sensitive receptors?	Changes in ambient noise levels (measured in A-weighted decibels [dBA]) that exceed allowable noise levels (in dBA) established by federal, state, or local laws, regulations, or guidelines (EPA-recommended outdoor noise standard of 55 dBA day-night average sound level [Ldn])
Soils	How would the construction, operations, and decommissioning of the Project impact fragile soil resources within the proposed project area? How would construction, operation, and decommissioning activities impact soil productivity due to increased erosion or compaction?	Acres of temporary and permanent disturbance to soils. Presence of potentially erosion-prone soils
Transportation	How would traffic associated with the construction, operation, and decommissioning of the Project impact existing traffic patterns on U.S. Route 180, State Route 64, and Forest Service access roads?	Numbers of trips associated with U.S. Route 180, State Route 64, and on Forest Service access roads
Aesthetics and Scenery Resources	How would the Project construction and operation impact the visual quality of the landscape?	Change in contrast from sensitive viewing locations
Water Resources		
U.S. Army Corps of Engineers Jurisdictional Waters, including Wetlands	How would ground disturbance during construction impact potential waters of the U.S. (WOTUS), including wetlands within the proposed project area?	Acres of dredge or fill activities occurring during construction within WOTUS resulting in loss. Provide a qualitative discussion of potential impacts from surface-disturbing activities within WOTUS, including indirect impacts from sediment transport.
Watershed Condition Indicators	How would ground disturbance during construction impact watershed condition indicators such as riparian zones and aquatic wildlife species and habitat within or near the proposed project area?	Acres of surface disturbance within a 50-foot buffer of intermittent, ephemeral, and perennial waters. Provide a qualitative discussion of potential impacts from surface-disturbing activities to surface waters and subsequent impacts to watershed condition indicators.

Table 3. Issues Not Analyzed in Detail in the EA

Resource Issue	Rationale and Findings
Air Quality	Construction and operations equipment and ground disturbance would result in short-term, localized emissions of regulated air pollutants, including carbon dioxide, nitrogen oxides, particulate matter, and volatile organic compounds. Project emissions would be greatest during the construction period, which is estimated to be approximately 12 months. Only minimal emissions would be expected from equipment use during the operations phase. Coconino County, where the Project is located, is in attainment for National Ambient Air Quality Standards. Project construction and operations emissions would not appreciably increase regional regulated air pollutant concentrations or contribute to an exceedance of the National Ambient Air Quality Standards. Therefore, this issue is dismissed from further analysis.
Climate Change	Construction activities would lead to temporary increases in fugitive dust emissions and emissions from construction vehicles. These impacts would be temporary and minor and would have no influence on global climate change. Foreseeable landscape changes in the region are anticipated to include warmed and drier conditions with more intense storm events and increased wildfire risk. Although these impacts could damage transmission infrastructure, Project design and maintenance would mitigate these impacts to the practical extent. Climate change impacts would be minimal and therefore dismissed from further analysis.
Environmental Justice	No environmental justice populations, as defined by Executive Order 12898 (59 Federal Register 7629), would be affected by the Proposed Action. Potential environmental justice populations can be indicated by high proportions of minority populations (>50 percent of the population) or residents living in poverty. The Project takes place in a rural area approximately 10 miles from Valle, Arizona, which has a total population of 262. The minority population makes up about 48 percent of the population and 0.4 percent of residents were living in poverty (U.S. Census Bureau 2020a, 2020b). Because of the lack of environmental justice impacts, no further analysis is warranted.
Floodplains/Flood zones	There are no Federal Emergency Management Agency mapped regulatory floodplains in the project area. Therefore, this issue is dismissed from further analysis.

Resource Issue	Rationale and Findings
Invasive and Noxious Weeds	Project construction activities have the potential to introduce and extend the range of invasive and/or non-native plant species to previously undisturbed areas in the project area or off-site to other locations. BMPs for invasive species controls would be implemented by the Proponent and its contractor to minimize the introduction, or reduce the spread of, invasive and non-native species (see Table 7). Hauling equipment would be cleaned of plant parts and soil/debris prior to entering or leaving the project area and by using native vegetation in the Project's landscaping. Therefore, the Project is anticipated to result in negligible effects on the introduction or proliferation of invasive and/or non-native plant species and no further analysis is warranted.
Paleontology	According to previous geologic mapping and current Potential Fossil Yield Classification (PFYC) designations, the project area crosses 536 acres of PFYC 1 or 2 (very low to low), 274 acres of PFYC 3 (moderate), 58 acres of PFYC 4 (high), and 272 acres of PFYC U (unknown) (Bard et al. 2016; Billingsley et al. 2006; Billingsley et al. 2007; Bonde and Slaughter 2020; Bureau of Land Management 2022; Hirschberg and Pitts 2000). There are no known previously recorded paleontological localities within the project area. Based on information provided by the Forest Service and Reclamation, the areas designated as PFYC U including Quaternary alluvial, colluvial, eolian, valley-fill, and ponded sediments are considered locally to have low potential for paleontological resources. Impacts to paleontological resources, known and unknown, could occur during ground disturbance where fossils maybe uncovered, moved, broken, or crushed. New disturbance—including three 2-foot-wide, 3-foot-deep trenches—would be completed for the BREC collection line corridors through mapped PFYC 3, Permian Kaibab and Toroweap Formations. Ground disturbance in PFYC 4, Triassic Moenkopi Formation, would be limited to the installation of the APS fiber-optic cable within the existing approximately 300-foot-wide NSTS ROW on Kaibab NF, ASLD, and private lands. The fiber-optic cable would also cross areas of PFYC 3. Due to existing disturbances within the NSTS ROW, grading is anticipated to be minimal and limited to areas of previous surface disturbance. Access roads are described in Section 2.1.1.7, Access Roads. Due to the previous surficial disturbance in the PFYC 4 portions of the project area, the natural cover of recent sediment or sand and vegetation across most of the project area, and limited disturbance planned within previously undisturbed PFYC 4 areas, the potential for paleontological resources to be disturbed by Project ground disturbance or increased human activities is low. Therefore, the Forest Service and Reclamation determined that the Project BMPs would mitigate impacts to paleontological resources to the point that detailed analysis is not warranted.

Resource Issue	Rationale and Findings
Public Health and Safety	Construction and operation of the Project would not include the use of hazardous materials, except for chemical constituents contained in fuels (gasoline and diesel fuel) and lubricants (oil and grease). The Proponent and its contractors would comply with all hazard communication and hazardous material laws and regulations regarding these chemicals and would implement a Spill Prevention, Control, and Countermeasures Plan (SPCC) to minimize the leaks of motor oils, hydraulic fluids, and fuels. In addition, the Proponent and its contractors would comply with all applicable federal and state regulations regarding notices to federal and local emergency response authorities and development of applicable emergency response plans, if required. With these measures and implementation of Project BMPs (see Table 7), no direct or indirect impacts from hazardous materials are anticipated. There would be a low risk of introducing fires because most electric lines and associated materials are non-combustible (aluminum, steel, or glass). Auxiliary systems would also include fire prevention planning. The fire protection system for the BREC would include fire protection water systems, portable water tanks (buffalos), and portable fire extinguishers (NEER 2021). Public health and safety measures that are included as part of the BREC Coconino County Conditional Use Permit (CUP) (NEER 2021) would be implemented for the BREC Interconnection Project. Additional emergency response would be provided externally by local service providers, if required. The Proponent would develop a fire prevention and escape plan in consultation with the High Country Fire Rescue fire department for the BREC, which would be applicable to the Project. This plan would be approved by Coconino County and become a part of the authorization for operations at the BREC. The Proponent has consulted with the High Country Fire Rescue fire chief regarding the proposed Project and the BREC, and would continue to do so throughout planning and implementation of the Project and the BREC, including providing resources and funding. With the implementation of the measures and design BMPs in Table 7, impacts associated with wildfire risk would be significantly reduced, so no further analysis is necessary.

Resource Issue	Rationale and Findings
Recreation/ Access	Recreation opportunities exist on NFS lands and ASLD lands in the vicinity of the project area. No formal recreation opportunities exist on private property. Opportunities for hunting, off-highway vehicle (OHV) riding, and driving for pleasure are available on the designated system of NFS roads and motorized trails. The NFS road system provides access to areas on the Kaibab NF including private land, recreational opportunities, research sites, facilities, and to support forest and resource management (Forest Service 2014a). Project activities on NFS lands would be limited to within the existing ROWs. Project activities may result in minor temporary impacts to recreational uses and access. Construction impacts would be temporary, lasting the duration of the 5-month fiber-optic line construction period and may result in access restrictions or limitations in addition to noise and visual impacts from construction activities. Up to 18 miles of new access roads may be constructed within the NSTS ROW; however, these access roads would only be maintained for operational use associated with the fiber-optic line similar to the existing access roads within the NSTS ROW. As part of the proposed action, fencing and signage would be posted prior to construction to inform the public and ranch users of construction activities. The Project would not impact recreational opportunities in the vicinity of the project area, beyond temporary access restrictions during Project construction. Traffic and noise during Project operations would be negligible. Therefore, no further analysis is warranted.
Socioeconomics	Construction of the Project would require approximately 40 workers over the estimated 12-month construction period. The workforce is expected to be drawn from surrounding communities, northern Arizona, the Flagstaff metropolitan area, and from crews traveling with the contractor to various construction sites. These jobs would be temporary and would not affect the overall employment of Coconino County and the larger region, as they would represent a negligible temporary increase in employment. Because these impacts to employment would be temporary and negligible, no further analysis is warranted.
Threatened and Endangered Plant Populations and Habitat	The U.S. Fish and Wildlife (USFWS) Information for Planning and Consultation (IPaC) database (USFWS 2022a) was searched regarding federally threatened and endangered species with the potential to occur in the project area. The results included Fickeisen plains cactus. The project area is outside the known range of this species, and no individuals were observed during biological surveys of the project area. Therefore, the species would not be affected by the proposed Project and is not carried forward for analysis. There is no critical habitat for federally threatened or endangered plant species in the project area or vicinity, and so this resource is not analyzed further in this EA (USFWS 2022a, 2022b).

Resource Issue	Rationale and Findings
Threatened and Endangered Wildlife Species	The USFWS IPaC database was queried regarding federally threatened and endangered species with the potential to occur in the project area. The results included California condor, Mexican spotted owl, yellow-billed cuckoo, northern Mexican gartersnake, and monarch butterfly, a candidate species. California condor can potentially occur anywhere; however, given the species large range, the limited size of the project area, and the likelihood of occurrence is so low as to preclude the need for further analysis. There is no suitable habitat in or near the project area for Mexican spotted owl, yellow-billed cuckoo, or northern Mexican gartersnake. Monarch is a candidate species and while flowering plants are present in the project area that could serve as a nectar source for the species during migration, there is no suitable breeding habitat present as no milkweed plants occur in or near the project area. The removal of flowering plants would not impact the species as the surrounding area contains numerous flowering plants and those removed would be an insignificant reduction in their abundance. There is no critical habitat for federally threatened or endangered species in the project area, or vicinity so this resource is not analyzed further in this EA (USFWS 2022a).
Water Quality	During construction, impacts to water quality in streams or water bodies in the project area are not likely due to the implementation of the Erosion Control and Stormwater Drainage BMP, including the Stormwater Pollution Prevention Plan (SWPPP). This BMP would be implemented to effectively control soil erosion and mitigate potential impacts to downstream water quality that could potentially be affected by runoff from soil erosion and sedimentation (or fuel spills) into drainages. Because impacts to water quality would be negligible after implementation of these measures, no further analysis is warranted.
Water Quantity	During construction, small amounts of water would be used for fugitive dust control and for the concrete required for the foundations in the proposed substation, line tap, and microwave tower sites. All water required during construction would be trucked in from private, permitted, groundwater water sources in Williams and/or Valle. It is anticipated that a negligible amount of water, approximately 480,000 gallons, would be required during construction of the Project, which would represent a correspondingly negligible and discountable impact on water quantity. Permanent water use would not be necessary for the Project.

2.0 Proposed Action and Alternatives

2.1 PROPOSED ACTION

Under the proposed action, the BREC Interconnection Project would interconnect BREC to the Moenkopi to Cedar Mountain 500-kV transmission line operated by APS. The interconnection facilities would include the BREC Interconnection Project's collection lines, substation, switchyard, and an APS line tap. The APS line tap would require redundant communication to the Moenkopi and Cedar Mountain substations; therefore, in addition to the line tap, APS would design, construct, and operate a microwave tower in the switchyard and a 25-mile-long, backup communications fiber-optic line to the Cedar Mountain Substation. The BREC access road, interconnection access road, and NSTS transmission line right-of-way (ROW) roads would be used for construction of the interconnection facilities north of U.S. Route 180 (U.S. 180). South of U.S. 180 to the Cedar Mountain Substation, access to the fiber-optic line would be on existing access roads and newly proposed access roads. The BREC Interconnection Project components are shown in greater detail in Figure 2 and Figure 3 and described in Table 4.

2.1.1 PROJECT CONSTRUCTION

2.1.1.1 BREC Interconnection Project Components

The following components would be included in the proposed action. These components are illustrated in detail in Figure 2 and Figure 3.

Table 4. Project Components to be Included in Interconnection Project NEPA Analysis

Project Component	Description
Three underground electrical collection line corridors	Three 34.5-kV underground electrical collection lines originating on private land lease areas. The collection lines would connect to the substation and would be constructed within the 50-foot-wide construction easement shown on Figure 3.
Substation	The substation would be an approximate 5-acre area consisting of parallel sets of internal power distribution systems (i.e., 34.5-kV buses and circuit breakers, disconnect switches, and main step-up transformers). The substation would connect to the line tap facilities switchyard via a short transmission line directly from the substation to the switchyard. Transmission poles are not required between the substation and line tap facilities.

Project Component	Description
Line tap facilities (line tap and switchyard)	The line tap facilities designed by APS include the line tap and switchyard (see Figure 2). During construction, a 15-acre area would be cleared and graded to facilitate construction of the 5-acre line tap facility and 10 acres for the substation and switchyard. The line tap facilities would be graveled and fenced. The line tap would consist of: • (1) three-pole 500-kV breaker • (2) 500-kV switches • (1) 500-kV single phase station service voltage transformer (SSVT) • (1) single-pole 500-kV breaker • (1) single-pole 500-kV switch • (1) single-pole 500-kV Current Transformer (CT) • (1) control house and associated relays, batteries, and chargers • (1) pad-mount station power transformer feed from customer transformer tertiary • (1) diesel generator • (1) site security monitoring equipment • Associated structures/bus supports/fence
Line tap interconnection poles	One to two line tap interconnection poles would be required outside of the line tap area to connect the line tap with the Moenkopi to Cedar Mountain line. The spans between fiber poles may vary based on terrain. The poles would be approximately 60 feet in height and have a 30-foot-diameter disturbance area.
Pulling and tensioning sites	Several pulling and tensioning sites would be required for the substation, line tap facilities, and line tap fiber poles. Each pulling and tensioning site would be approximately 100 by 100 feet and would temporarily disturb up to 2 acres in total.
Microwave tower	The microwave tower would be located in the line tap facilities switchyard area (see Figure 2 and Figure 3). The microwave tower would be approximately 30 to 50 feet in height and would not require lights per the Federal Aviation Administration (FAA).
BREC access road	The BREC access road is a proposed access road that will be constructed as part of the proposed BREC prior to the start of the BREC Interconnection Project. The BREC access road begins at U.S. 180 and extends eastward paralleling the existing 500-kV Moenkopi transmission line for approximately 7.25 miles prior to turning northward into the BREC (see Figure 2 and Figure 3). Construction of the BREC access road will be completed under the no action alternative (see Section 2.2). The BREC access road would be used to access the fiber-optic line north of U.S. 180 and to access the interconnection access road.

Project Component	Description
Interconnection access road	A new permanent interconnection access road would be constructed for the BREC Interconnection Project to access the substation and switchyard. The interconnection access road would be a 16-foot-wide road extending eastward from the BREC access road paralleling the existing 500-kV Moenkopi transmission line for approximately 1.5 miles and terminating at the substation and switchyard (see Figure 2 and Figure 3).
One temporary laydown area (for fiber construction from Cedar Mountain Substation to U.S. 180)	5-acre laydown area to be used for staging construction equipment.
25-mile-long APS fiber-optic corridor from Cedar Mountain Substation to the interconnection line tap facilities (switchyard)	This corridor would include the following components: • Wooden poles distributed along the corridor and spaced at approximately 8 to 10 poles per mile. • A corridor width of no more than 300 feet. • Wooden poles not to exceed 65 feet in height, except at road crossings where wooden poles may reach a height of up to 100 feet, with guyed wires and bird flight diverters. Poles at road crossing would be located within the NSTS ROW. • The wooden poles would be built within the existing NSTS ROW, within 100 feet north of the existing 500-kV towers which are also located within the NSTS ROW (see Figure 2). • Temporary and permanent use of existing and new access roads as described in this EA (see Section 2.1.1.7). • Where the fiber-optic line intersects and/or crosses State Route (SR) 64 and U.S. 180, the fiber-optic line may be constructed via horizontal directional drilling or aerial installation to minimize ground and traffic disturbance.

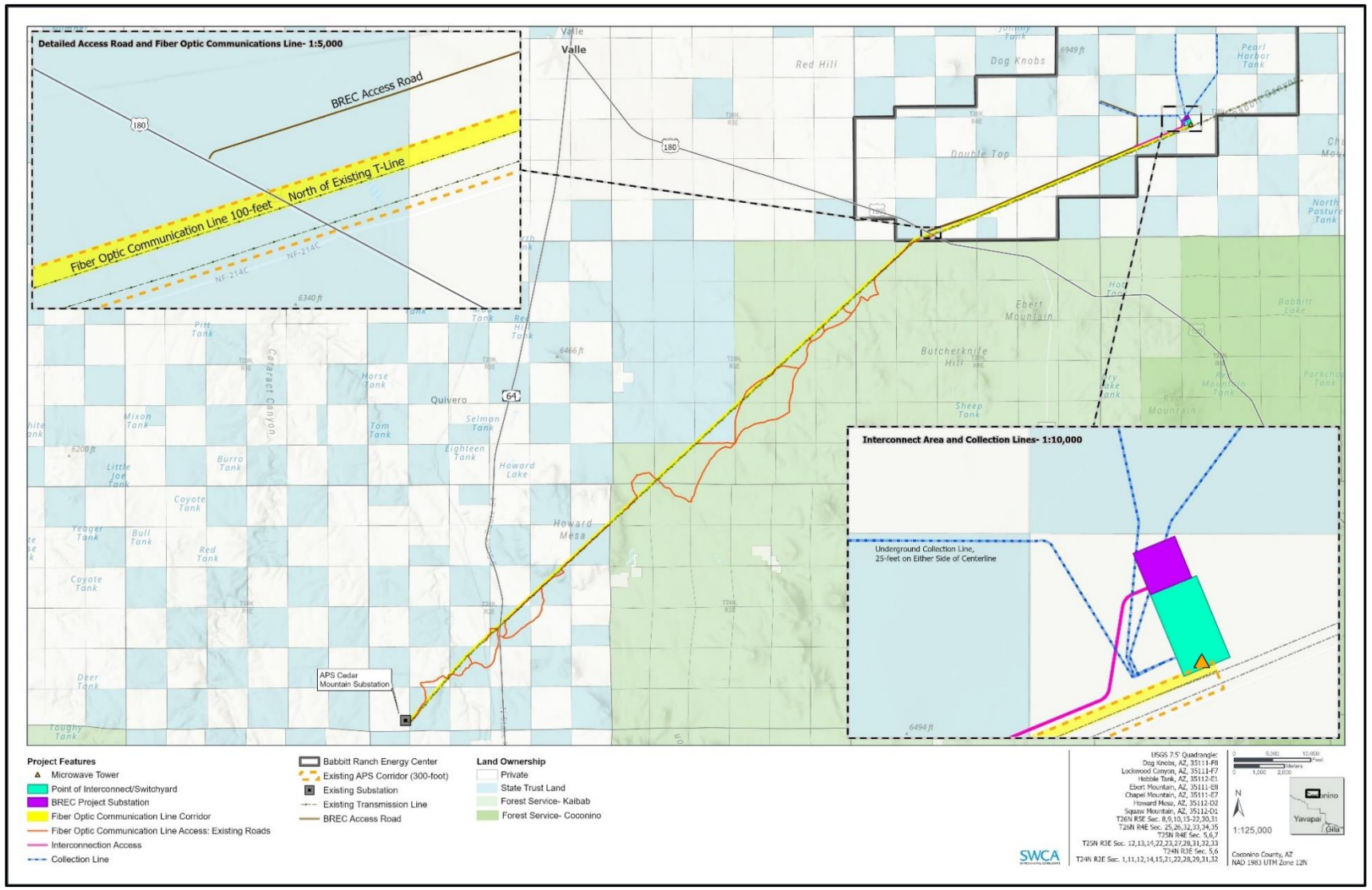

Figure 2. BREC Interconnection Project and existing NSTS 300-foot right-of-way corridor.

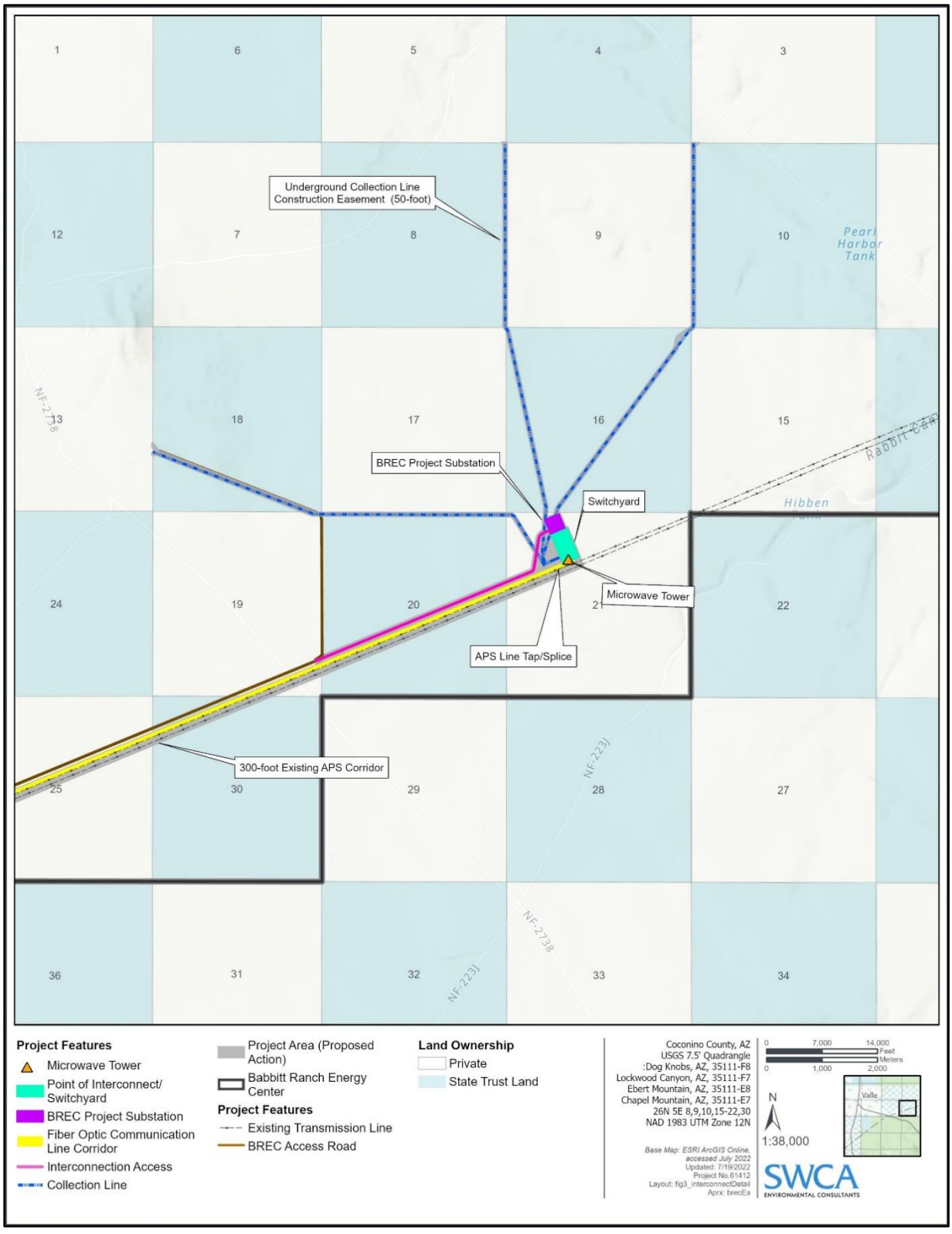

Figure 3. BREC Interconnection Project detail.

2.1.1.2 Forest Service Special Use Permit

The Kaibab NF would issue a special use authorization to APS for legal use and access across NFS lands needed for the Cedar Mountain Substation to BREC Interconnection Project fiber-optic corridor. A special use authorization is a legal document such as a permit, term permit, lease, or easement that allows occupancy, use, rights, or privileges of NFS lands.

2.1.1.3 Temporary and Permanent Disturbance

A summary of the total estimated disturbance area is listed in Table 5. Permanent disturbance refers to disturbance during the estimated 40 year-life span of the Project. The BREC Interconnection Project decommissioning is discussed in Section 2.1.3, Project Decommissioning.

Table 5. Estimated Acres of Temporary and Permanent Disturbance

Project Component	Acres	
	Temporary Disturbances (to be reclaimed)	Permanent Disturbance
Three underground electrical collection line corridors	64	0
Substation	10	5
Line tap facilities (line tap, switchyard, and microwave tower)	15	11
Line tap interconnection poles	0.05	0.01
Fiber-optic poles (30-foot diameter clearing per pole for 79 poles) on Forest Service lands (Cedar Mountain substation to APS line tap)	0	1.3
Fiber-optic poles (30-foot diameter clearing per pole for 120 poles) on non-Forest Service lands (Cedar Mountain substation to APS line tap)	0	1.9
One temporary laydown area (for fiber construction from Cedar Mountain Substation to U.S. 180)	5	0
Fiber-optic corridor (300-foot-wide) new access roads on NFS lands (Cedar Mountain substation to APS line tap) [1]	32.7	10.9
Fiber-optic corridor (300-foot-wide) new access roads on non-NFS lands (Cedar Mountain substation to APS line tap) [1]	32.7	10.9
Interconnection (16-foot-wide) new access road to interconnection facilities	0	2.9

Project Component	Acres	
	Temporary Disturbances (to be reclaimed)	Permanent Disturbance
Pulling and tensioning sites[2]	20	10
Total	**179.5**	**53.91**

[1] The 300-foot-wide fiber-optic corridor corresponds with the existing, disturbed NSTS ROW corridor. During construction, new access roads would consist of a 30-foot-wide temporary road construction within the NSTS ROW. New access roads would be reduced to a permanent 10-foot-wide two-track road that would remain for long-term operations and maintenance access. Acreages estimated using 18 miles of linear distance from the Cedar Mountain Substation to U.S. 180 (actual linear distance 17.3 miles) to allow for turnaround areas and cultural site resource avoidance. Fiber-optic corridor construction road access north of U.S. 180 to the APS line tap would be via the existing BREC access road.

[2] Pulling and tensioning sites would be located within the 300-foot-wide NSTS ROW. The exact locations for these Project components would be based on final engineering of the fiber-optic line and would be sited to avoid historic properties and sensitive resources. The Proponent would coordinate these locations with Reclamation and the Forest Service prior to construction.

2.1.1.4 Workforce

The BREC Interconnection Project construction would require approximately 40 workers over the construction period of 12 months. The fiber-optic cable from the Cedar Mountain substation to the APS line tap would require a period of 5 months. At a minimum, the fiber-optic cable would require eight workers total: two workers for digging holes, three workers for setting poles, one worker for stringing, dead-ending, and clipping, and two workers for fiber splicing over the construction period; if the schedule is compressed, these numbers would increase. The work force is expected to be drawn from the surrounding communities, northern Arizona, the Phoenix metropolitan area, and from crews traveling with the contractor to various job sites.

2.1.1.5 Transportation and Equipment

During construction, the BREC Interconnection project area would be accessed from U.S. 180 via the BREC access road and interconnection access road as shown on Figure 2 and Figure 3. Equipment used during construction would include heavy civil equipment for site preparation and clearing, leveling, and compacting the foundation sites and transmission structure locations, and cranes to assemble and lift the structures into place (see Table 6 for further details). Approximately 14,160 construction trips would be needed for equipment, materials, and personnel over the 12-month construction period (average of 59 trips per day over a 5-day workweek).

Equipment access to the APS fiber-optic cable from the Cedar Mountain substation to the line tap would be along the existing NSTS ROW. Approximately 960 construction trips would be needed for equipment, materials, and personnel over the 5-month construction period (average of 4.8 trips per day over a 5-day workweek).

Table 6. Estimated Vehicles and Equipment Used for Project Construction

Activity	Equipment
Materials hauling	Several tractor trailers, tractor-mounted crane, several pickup trucks, flatbed truck, rough terrain crane to unload and set equip, forklift
Site preparation and clearing	Motor grader, pickup trucks, bulldozer, backhoe, brush mower
Preparation of concrete foundations and transmission structures sites	Dozer or motor grader, pickup truck, flatbed truck, backhoe, excavator
Transmission structure excavation, hole auguring, foundations	Mounted auger truck, backhoe, pickup truck, air compressor
Structure assembly	Hydraulic cranes, pickup trucks, flatbed trucks, compressor, forklift
Wire stringing	Puller, tensioner, reel-stringing trailers, materials truck, bucket trucks
Microwave tower assembly	Tractor-mounted crane, several pickup trucks, bucket truck
Fiber-optic and collection line trench	Pickup truck, flatbed truck, trenching machine
Access roads	Motor grader, pickup trucks, bulldozer, backhoe, brush mower
Revegetation and restoration	Bulldozer with ripper, grader, front-end loader, tractor with harrow/disk, pickup truck, hydro seeder (mulcher)
APS fiber-optic cable (Cedar Mountain to APS line tap)	The fiber-optic cable would use trucks, splice trailers, fusion splicers, and Optical Time Domain Reflectometer (OTDR) test equipment. For installing the cable to the poles crews would typically have trucks, reel trailers, bull-wheel tensioner trailer, cable puller, sheave stringing block wheels, come-along grips, and anti-rotational devices. Equipment needed for digging and setting poles would depend on the construction method used. The types of vehicles that could be used include helicopter, side-by-sides, four wheel-drive pickups, larger trucks with trailers to haul poles, line trucks with augers, bucket trucks, backhoes, water trucks, pulling and tensioning equipment, truck with trailer for splicing.

Helicopters

Helicopters would be used to support construction activities of the 25-mile fiber-optic line. Helicopter use may include, but is not limited to, areas where access is limited (e.g., no suitable access road, limited construction area to facilitate on-site structure assembly, and/or where there are environmental constraints to accessing the project area with standard construction vehicles and equipment) or where system outage constraints are a factor. Helicopters may be used in other areas to facilitate construction of the Project as the exact method of construction employed and the sequence with which construction tasks occur would be dependent on final engineering, contract award, conditions of permits, and contractor preference.

Project-related helicopter construction activities may include delivery of equipment and materials to structure sites, structure placement, hardware installation, and optical ground wire stringing operations (if applicable).

Flights within the Work Area

Depending upon the specific needs, Project-related helicopter activities for the construction of the fiber-optic line could occur across the entire 25-mile corridor. Wooden poles would be transported via helicopter to the sites for placement. Helicopters could also be used for line stringing operations.

Use of helicopters would be required at pole locations that are inaccessible by road. The helicopter may travel back and forth between wooden pole locations and the laydown yard multiple times. The helicopter would be used up to 1 hour at each pole.

Prior to the start of construction, APS and the selected construction contractor would create a detailed Helicopter Use Plan. This plan would ensure Federal Aviation Administration (FAA) regulations/guidance and/or industry BMPs are met, including 14 CFR 77 and in coordination with the applicable FAA Flight Standards District Office. It would also include flight routes and altitudes to avoid aircraft congestion. Flight paths would be filed with the FAA, as appropriate.

2.1.1.6 Construction Power, Water, and Mineral Materials

Distribution power for the microwave tower would come from the switchyard or a proposed backup generator at the substation. Power for the line tap would be provided by a 500-kV station service voltage transformer. Back feed power for the substation would also be provided by the 500-kV station service voltage transformer via the line tap. Backup power for the microwave tower would be provided by a diesel-powered generator.

Construction water for dust control, equipment washing, foundation construction, and other needs, would be trucked in and sourced from private, permitted groundwater water sources in Williams and/or Valle. No municipal water would be used. During construction, water would be stored at the laydown area in aboveground water storage tanks. The total anticipated water use during construction for both the BREC Interconnection Project and the fiber-optic line corridor is approximately 480,000 gallons (1.47 acre-feet).

Mineral materials such as sand and gravel for construction and road base would be sourced from a permitted external source. The materials source would be identified approximately 3 months prior to the start of construction.

2.1.1.7 Access Roads

Construction and operations access to the fiber-optic corridor and substation and switchyard north of U.S. 180 would be provided via two road segments: (1) the BREC access road, which will serve as primary access to the BREC project, and (2) the interconnection access road. The approximate 7.25-mile BREC access road will be constructed as part of the proposed BREC project and is

discussed in Section 2.2, No Action Alternative. The proposed action would use the first approximately 5.5 miles of the BREC access road from U.S. 180 to the interconnection access road. The interconnection access road, a 1.5-mile extension of the BREC access road, would provide construction and operation access to the interconnections facilities and is reviewed as part of the BREC Interconnection Project (see Figure 3). The interconnection access road would be 16 feet wide and constructed with compacted subgrade overlain by aggregate material.

South of U.S. 180, there are two types of proposed access roads, existing access roads, and new access roads:

- Existing access roads: Access to the NSTS ROW and within the NSTS ROW would primarily occur on existing access roads (see Figure 2 and Figure 3). Only minimal improvements to the existing two-track roads would occur, and only within the existing road apron proper. APS maintains a ROW for the existing access roads that fall outside of the NSTS ROW. There are approximately 28 miles of existing access roads that may be used.
- New access roads: New access roads for the fiber-optic corridor would be constructed within the 300-foot-wide NSTS ROW where an existing access road does not provide access to a proposed pole location or where a new road is necessary for resource avoidance. New access roads would have a construction width of 30 feet and would be reclaimed to a permanent width of 10 feet. New access road construction would include clearing and grading a 30-foot-wide road. Acres of temporary and permanent disturbance for new access roads are provided in Table 5. These acres were estimated using an approximate linear distance of 18 miles from the Cedar Mountain Substation to U.S. 180.

The total miles of existing access road use south of U.S. 180 would be approximately 12 miles on non-federal lands (i.e., ASLD and private lands) and approximately 16 miles on NFS lands. Up to 18 miles of new access roads may be constructed within the 300-foot-wide NSTS ROW, 9 miles of which are on non-federal lands and 9 miles of which are on NFS lands.

BMPs as detailed in Table 7 would be applied to ensure effects are minimized.

2.1.1.8 Reclamation and Revegetation

Post-construction, the temporary disturbance areas would be regraded to mimic surrounding natural contours and revegetated with a certified weed-free seed and mulch on private and ASLD lands and Forest Service-approved native seed mix on NFS lands. Mulch may be applied as required to provide additional erosion control. Ungraded areas disturbed by overland travel would be assessed to determine if reclamation is needed for recovery of the area. Forest Service-approved weed-free material sources (seed, mulch, fill) would tier to *Guidelines for Weed-Free Seed, Forage, Mulch, and Fill Materials in Region 3* (Forest Service 2015), which recommends that local staff be involved with selecting, inspecting, and approving sources. The Forest Service would only approve materials on NFS lands.

2.1.2 PROJECT OPERATIONS AND MAINTENANCE

Once construction is completed, on-site personnel would operate and maintain the BREC Interconnection Project, including the Babbitt Ranch Energy Center, LLC–owned interconnection facilities. APS would be responsible for long-term operations and maintenance of the line-tap, microwave tower, and 25-mile fiber line corridor. All road use and maintenance activities would remain within the existing road apron.

For the BREC Interconnection Project, routine preventative maintenance would occur on an approximately 6-month basis and unplanned maintenance would occur as necessary. For the fiber-optic line, the corridor would undergo inspection by APS every 3 to 5 years. These activities would primarily consist of one to two technicians visiting the site and visually inspecting the facilities.

Operations and maintenance personnel and equipment accessing the BREC Interconnection Project would be minimal during operations. Up to four personnel would conduct the routine maintenance and equipment used would typically consist of passenger vehicles and light-duty trucks. Other operations and maintenance vehicles and equipment would be brought to the site on an as-needed basis.

2.1.3 PROJECT DECOMMISSIONING

The BREC Interconnection Project has an anticipated useful life of at least 40 years, coinciding with that of the BREC. If the BREC is not repowered at the end of this anticipated useful life, the goal of decommissioning would be to remove the substation and return the site to a condition as close to a pre-construction state as feasible. All decommissioning and reclamation would be completed in compliance with applicable federal, state, and local requirements.

Shallow foundations, like that for the substation, would be removed in their entirety. Foundations deeper than 36 inches below the ground surface would be left in place, as their removal from greater depths would cause greater environmental impacts than leaving them in place. All excavated concrete and steel debris would be removed from the site. Voids left by the removed concrete foundations would be filled with Forest Service-approved native material and restored to original grade. Areas disturbed during decommissioning would be restored as near as possible to their original condition and would be available for the same uses that existed prior to construction.

Because the APS line tap and microwave tower would be owned and operated by APS as part of its transmission systems, they would not be decommissioned at the same time as the BREC.

2.1.4 BEST MANAGEMENT PRACTICES

The BMPs incorporated as part of the proposed action are listed in Table 7. The environmental effects analysis conducted for this EA considers environmental effects after these BMPs are implemented. Implementation of BMPs would be required.

Table 7. Best Management Practices to Avoid, Minimize, and Mitigate Impacts

Resource Issue	Best Management Practice
Aesthetics and Scenery Resources	• Reclamation of all temporary surface disturbances would be initiated upon completion of activities. Reclamation of disturbed areas shall, to the extent possible, include contouring disturbances to blend with the surrounding terrain, replacing topsoil, smoothing and blending the original surface colors to minimize impacts to aesthetics and scenery resources, and seeding the disturbed areas with native seeds. • Construction activities would primarily be limited to daytime hours. If night work is required during construction, lighting would be the minimum necessary for safety, and lighting would not be left on when not in use. • Fiber-optic wooden poles would be set at the maximum distance feasible in relation to sensitive viewing areas, such as the intersection of SR 64 and U.S. 180. • Any facility lights would be shielded.
Air Quality	• Dust management controls would be implemented during ground-disturbing activities. Controls may include road watering, as necessary. • Vehicle speeds would be limited to 25 miles per hour to minimize fugitive dust.
General Wildlife	• The contractor would fill any trenches or holes within a reasonable time frame or cover them at night or provide escape ramps every 147 feet (45 meters) when not in use. • Escape ramps could be short lateral trenches or wooden planks sloping to the surface at an angle of 45 degrees or less to prevent entrapment of wildlife. • Trenches that have been left open overnight would be inspected, and wildlife would be removed prior to backfilling. • The substation and switchyard would be fenced following the AGFD's wildlife - friendly fencing guidelines as applicable (AGFD 2009).

Resource Issue	Best Management Practice
Cultural Resources	• Preparation and implementation of an agency-approved Monitoring and Discovery Plan. • Placement of fiber-optic poles outside the boundaries of cultural resources. • Archaeological monitoring of ground-disturbing construction activities within 50 feet of a National Register of Historic Places (NRHP)-eligible or potentially NRHP-eligible cultural resources. Monitoring would be conducted within previously recorded NRHP-eligible or potentially NRHP-eligible site boundaries even if those boundaries have been adjusted during the current field inventory. • Placement of temporary fencing or flagging around the boundaries of cultural resources for avoidance during construction. • Imported earthen material would come from ADOT–approved borrow source. • Cultural awareness training would be implemented for construction workers prior to construction.
Erosion Control and Stormwater Drainage	• A construction Stormwater Pollution Prevention Plan (SWPPP) would be submitted to the Arizona Department of Environmental Quality to obtain a Notice of Intent prior to construction to control off-site migration of sediment and to control erosion during construction.
Land Use and Access	• Construction access to the private lands where the BREC Interconnection Project is located would be coordinated with the landowner. • Access to ASLD lands would be coordinated with ASLD.
Migratory Birds	• Preconstruction surveys would be conducted for nesting birds, including burrowing owls, prior to construction in suitable habitats that would be disturbed. If a migratory bird species is identified as nesting in the project area during construction, the contractor will stop work in that location and coordinate with federal or state wildlife agencies to determine appropriate measures to avoid disturbance. • Active nest surveys would be conducted by a qualified biologist if clearing, grubbing, or tree/limb removal would take place during the bird breeding season (February 1 to August 31). Such surveys would be conducted prior to removal of the trees or limbs. • If active raptor nests are detected during construction, Project-related activities would be restricted within 300 yards of active raptor nest sites between April 1 and August 15, in accordance with the Forest Plan (Forest Service 2014a). • Preconstruction surveys for nesting birds would be conducted no more than 7 days prior to vegetation removal or ground disturbance, and any active nests buffered at a distance to be determined by consultation with the Forest Service biologist.

Resource Issue	Best Management Practice
Noise	• Construction haul truck and materials delivery traffic shall avoid residential areas whenever feasible. • The construction contractor shall place noise- and vibration-generating construction equipment and locate construction staging areas away from sensitive receptors whenever feasible. • Construction activity would be limited to daytime hours. • Prohibit unnecessary idling of internal combustion engines.
Paleontology	• In the event of an unanticipated discovery during construction, work in the vicinity would cease to avoid impacts to paleontological resources. Additionally, Reclamation and the Forest Service would be notified, and the significance of the discovery would be evaluated by a third-party qualified paleontologist.
Soils	• All surface disturbances, including access roads, parking, fiber pole construction, equipment staging areas and material stockpiling areas, electrical lines, microwave tower, substation, generation-tie transmission line, and APS line tap facilities would be kept to the minimum necessary to accomplish construction of Project components. • Upon eventual Project decommissioning, areas would be restored as near as possible to their original condition and would be available for the same uses that existed prior to construction.
Special-Status Species	The following additional conservation and minimization measures would be implemented to reduce impacts on Forest Service Sensitive plant species and habitat: • Biological monitors present on-site during construction in the area where the Arizona phlox (*Phlox amabilis*) was found. The following measures would be implemented to reduce impacts on Forest Service Sensitive wildlife: • If a species is identified during construction, the contractor would stop work in that location and coordinate with federal or state wildlife agencies to determine appropriate measures to avoid disturbance.
Transportation	• Access for residents, recreational users, and emergency vehicles on roads to be used by the Project would be maintained. • Coordination would occur with ADOT for access improvements to U.S. 180 and SR 64 and with Coconino County for proposed access improvements to Powerline Road. The appropriate permit and approvals would be obtained for each location, if necessary. • The Project would follow ADOT guidelines for oversized loads, and all traffic control activities, personnel, and measures would be provided in accordance with the Federal Highway Administration's latest Manual on Uniform Traffic Control Devices for Streets and Highways.

Resource Issue	Best Management Practice
Vegetation	• Vegetation clearing would be minimized to the extent possible to install Project facilities, especially adjacent to SR 64 and U.S. 180. • Existing vegetation would be preserved where possible, to minimize exposure of soil and rock surfaces. Site stabilization would follow grading and the installation of Project facilities. • Where vegetation would be cleared, the edges would be feathered to reduce the creation of geometric clearings incongruent with the existing landscape character. • Reclamation of all surface disturbances would be initiated immediately upon completion of activities. Reclamation of disturbed areas shall, to the extent possible, include contouring disturbances to blend with the surrounding terrain, replacing topsoil, and seeding the disturbed areas with a Forest Service–approved native seed mix. • Revegetation efforts would strive to establish a stable biological ground cover equal to that which occurs nearby. Mulching may be appropriate for conserving moisture and holding seed on-site, thus improving the chances for successful establishment. Mulch would be Forest Service–certified weed-free.
Noxious Weed Management	To minimize the introduction of undesirable noxious or invasive weeds, a noxious weed management plan would be implemented. The plan would contain specific control measures to be implemented, such as the following: • reseeding of temporarily disturbed areas • use of only Forest Service–certified weed-free mulches, seed mixes, and fill materials • cleaning vehicles that would require leaving designated roadways • developing a specific laydown yard for storing equipment, materials, and vehicles • keeping personal vehicles, sanitary facilities, and staging areas at specific, limited weed-free locations • restricting and monitoring soil import from outside the BREC Interconnection Project area • Inspecting all equipment for presence of noxious weeds and cleaned prior to entering public land

Resource Issue	Best Management Practice
Waste and Hazardous Materials Management	• Clear and dispose of trash, debris, on those portions of the site where construction would occur at the end of each workday through all stages of construction. • Dispose of non-hazardous cuttings and debris in an approved facility designed to handle such waste. • Dispose of wastewater in accordance with federal, state, and county regulations. • No extremely hazardous materials are expected to be produced, used, stored, transported, or disposed of during construction of the BREC Interconnection Project. • To minimize leaks of motor oils, hydraulic fluids, and fuels, construction equipment and operations and maintenance vehicles would be appropriately managed. Per the Conditional Use Permit (CUP) submitted for the BREC on August 5, 2021, to Coconino County, a Spill Prevention, Control, and Countermeasures Plan (SPCC) Plan would be developed, as required by law, for the BREC and would have information about training, equipment inspection and maintenance, and refueling for construction vehicles, with an emphasis on minimizing spills. • During operations and maintenance, potentially hazardous materials would be stored in approved, aboveground containers with appropriate spill containment features.
Water Resources	• To the extent possible, construction activities would be scheduled to avoid direct soil disturbance during periods of the year when heavy precipitation and runoff are likely to occur. The amount of exposed or disturbed soil at any one time would be the minimum necessary to complete construction operations. Operation of equipment would be limited when ground conditions could result in excessive rutting, soil puddling, or runoff of sediments. • Vehicles to cross potential waters of the U.S. (WOTUS) features in approved locations only.

Resource Issue	Best Management Practice
Wildfire Risk	During construction and operations and maintenance, wildland fire prevention measures would be implemented to minimize fire risks, including: • limiting vehicle travel to and within construction areas to only essential vehicles • establishing parking guidelines in remote areas • banning smoking and non-construction flame sources outside of vehicles • establishing safety guidelines for construction flame and spark sources. The CUP submitted to Coconino County on August 5, 2021, includes BMPs to minimize wildfire risks. Additional emergency response would be provided externally by local service providers, if required.

2.2 NO ACTION ALTERNATIVE

Under the no action alternative, Reclamation would not approve an LGIA for the BREC Interconnection Project to the NSTS. The proposed interconnection facilities and fiber-optic line would not be constructed, and the Proponent would seek alternative interconnection options for delivering generated power to the electrical transmission system in northern Arizona.

Without Reclamation's approval of the LGIA, the Proponent would submit a Large Generator Interconnection request for interconnection to the Moenkopi to Eldorado 500-kV transmission line, which is owned and operated by SCE to the north of the BREC and has available capacity. The interconnection request would enter the SCE queue and require feasibility and system impact studies.

This interconnection alternative would consist of a substation located on the northwestern edge of the BREC with an approximately 8-mile-long, 500-kV generation-tie (gen-tie) line (Figure 4). A 500-kV, three-breaker ring-bus switchyard would be built at the interconnection point that would allow the BREC to connect into the 500-kV Moenkopi to Eldorado line. Similar site preparation and construction methods would be used for the construction of the substation, gen-tie line, and switchyard, as described in Section 2.1.1.1, BREC Interconnection Project Construction Components. Temporary disturbance for the construction of the substation and switchyard would be similar to the proposed action. Distribution power sources for the BREC could extend from multiple sources across non-federal lands and are not known. Communications for the non-federal alternative would use a fiber-optic line along a non-federal alignment, a satellite uplink, a microwave tower, or a combination of these. Conceptual communication locations are not known. All facilities for this interconnection option would be built on private and/or ASLD lands.

Since the BREC has a feasible interconnection option that does not include federal land or federal approvals, the energy center retains independent utility under NEPA. The BREC would not depend on Reclamation authorization of the requested interconnection and would not be a connected action under NEPA. A fiber-optic corridor would not be placed on NFS lands, thus negating the need for

an SUP from the Forest Service. Therefore, the scope of analysis under review by Reclamation in the EA is limited to the BREC Interconnection Project. The non-federal alternative is discussed in cumulative effects (see Section 4). Components of the non-federal alternative that would fall within the project area (see Section 1.3) are analyzed under the no action alternative.

The non-federal alternative includes the 7.5-mile-long BREC access road that originates at U.S. 180 and parallels the existing 500-kV Moenkopi transmission line for approximately 5.5 miles, then turns north to provide primary access to the BREC project area (see Figure 4). The BREC access road will be constructed in late 2022, regardless of Reclamation's approval or disapproval of the LGIA. Within the BREC Interconnection Project area, approximately 5.5 miles of the BREC access road would provide construction and operation access north of U.S. 180 for the proposed action's fiber-optic line and access to the interconnection access road (see Section 2.1.1.7). The BREC access road would be approximately 30 feet wide and constructed with compacted subgrade overlain by aggregate material.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

During preliminary planning for the Project, several alternatives were considered but dismissed from further analysis. Several microwave tower locations were considered for the Project. Due to line-of-sight constraints, the final tower location was chosen in Section 21 of Township 26 North, Range 5 East tangent to the BREC substation and inside of the APS switchyard.

Two alternatives were considered for the fiber-optic corridor: the first was the 25-mile corridor through the Kaibab NF selected for the proposed action; the second alternative considered but dismissed was an approximate 19-mile corridor along State Route (SR) 64 from Williams to Valle. This alternative was dismissed due to heightened resource concerns along the existing corridor. This alternative would require an additional 19 miles of improvements to an existing ROW and would have a greater potential to impact resources such as land use and cultural resources, and was therefore dismissed.

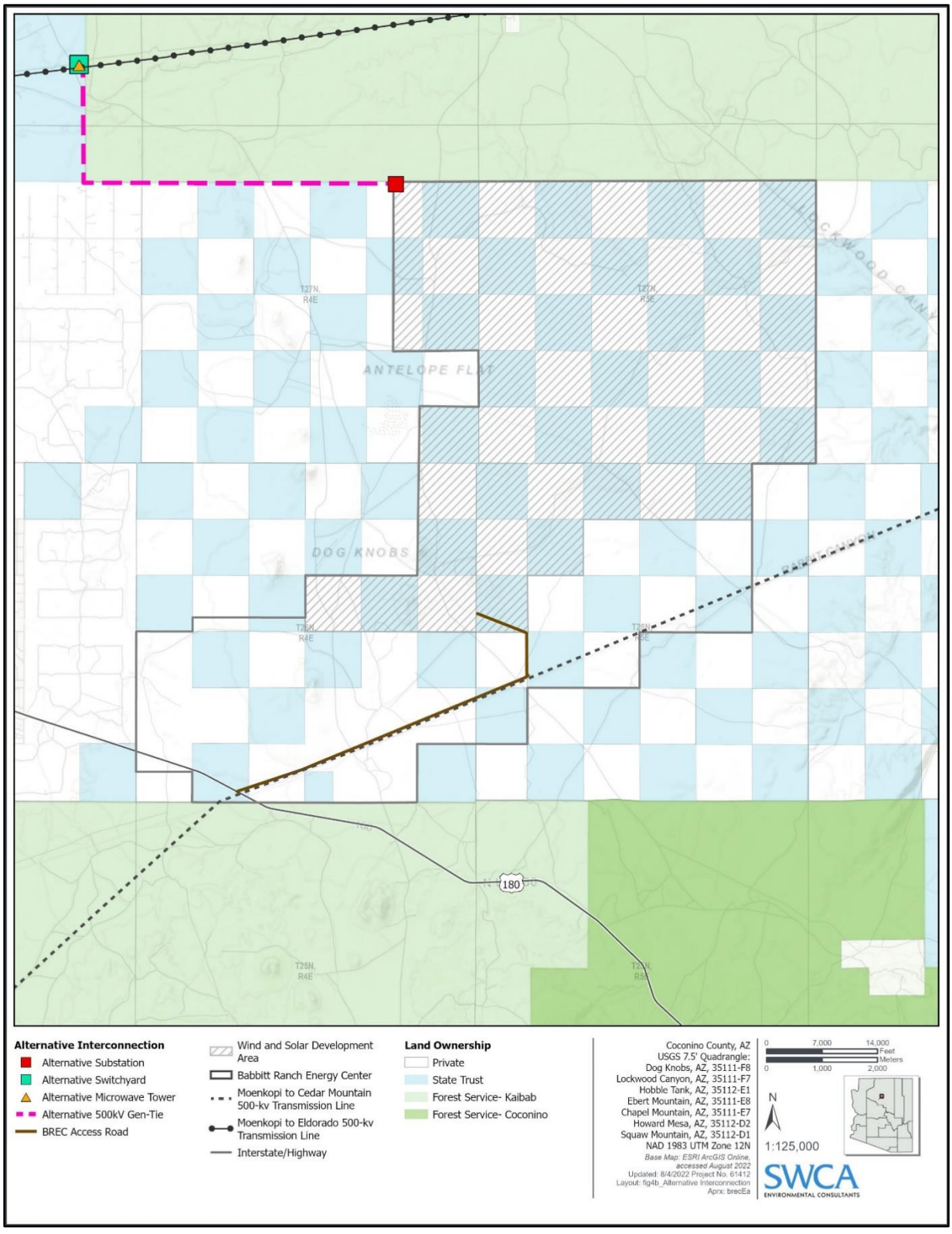

Figure 4. Alternative interconnection for BREC Interconnection Project.

3.0 Affected Environment and Environmental Consequences

This chapter presents the existing conditions in the project area and the environmental consequences that can be expected from implementing the proposed action and no action alternative. Environmental consequences are analyzed based on direct and indirect effects on resources under consideration within the project area. Cumulative effects are discussed in Chapter 4.

3.1 VEGETATION

3.1.1 AFFECTED ENVIRONMENT

The analysis area for vegetation is the project area. Vegetation throughout the project area is characteristic of the Great Basin Conifer Woodland biotic community, as mapped by Brown (1994). This biotic community corresponds to the Pinyon-Juniper Woodlands potential natural vegetation type identified by the Kaibab NF within the Forest Plan (Forest Service 2014a). This vegetation type accounts for more than 40 percent of the land cover on the Kaibab NF, and more than 12 percent of the land cover on the Williams Ranger District (Forest Service 2014a). SWCA Environmental Consultants (SWCA) biologists conducted visits on March 28, 2022, and April 26–28, 2022, to characterize the physical and biological features, including vegetation, present within the project area. Vegetation communities observed in the project area were characteristic of pinyon-juniper woodlands, which consist of an overstory of pinyon pine (*Pinus* spp.) and juniper (*Juniperus* spp.) trees with a grass and forb understory.

In the project area, vegetation varies from denser stands of twoneedle pinyon (*Pinus edulis*) and oneseed juniper (*Juniperus monosperma*) with an understory of grasses such as blue grama (*Bouteloua gracilis*), sideoats grama (*Bouteloua curtipendula*), and squirreltail (*Elymus elymoides*), to open grasslands with areas lacking an overstory of trees with scattered shrubs such as rubber rabbitbrush (*Ericameria nauseosa*), longflower rabbitbrush (*Chrysothamnus depressus*), broom snakeweed (*Gutierrezia sarothrae*), and Fremont's mahonia (*Mahonia fremontii*), and various forbs including globemallow (*Sphaeralcea* spp.) and fleabane (*Erigeron* spp.). Vegetation in the analysis area under the existing transmission line is open grassland. Other species observed in the project area include Indian ricegrass (*Achnatherum hymenoides*), spinystar (*Escobaria vivipara*), tulip pricklypear (*Opuntia phaeacantha*), and Whipple cholla (*Cylindropuntia whipplei*). No wetland or riparian vegetation (U.S. Army Corps of Engineers [USACE] 2020) was observed in the project area during the biological investigations.

Several non-native species were identified in the project area, including cheatgrass (*Bromus tectorum*), redstem stork's bill (*Erodium cicutarium*), sowthistle (*Sonchus* spp.), and prickly Russian thistle (*Salsola tragus*), none of which are listed as a noxious weed by the Arizona Department of Agriculture (ADA) (ADA 2022).

3.1.2 ENVIRONMENTAL CONSEQUENCES

3.1.2.1 Proposed Action

As stated previously, 233.41 acres of pinyon-juniper woodland vegetation would be impacted, with 179.5 being reclaimed post-construction and a permanent disturbance of 53.91 acres. The pinyon-juniper woodland vegetation community is locally and regionally abundant—with approximately 195,194 acres occurring within the Williams Ranger District alone (Forest Service 2014a)—and the amount of pinyon-juniper woodland vegetation that would be temporarily or permanently impacted by the Project is extremely small in comparison.

Following construction, temporarily disturbed areas would be reclaimed and revegetated using Forest Service–approved weed-free native seed mixes. Vegetation in these reclaimed areas would slowly return to pre-construction conditions over the 40-year operations and maintenance period. Permanent disturbance would be limited to the footprint of the structures installed during construction.

Mud and vegetative debris attached to vehicles and equipment transported to the project area during construction may contain seeds or other propagules of nonnative plant species and noxious weeds. Vegetation clearing and ground disturbance during construction may create conditions that are more favorable to the establishment of nonnative plant species and noxious weeds, which could lead to a shift in the composition of vegetation communities in the project area over time. However, potential adverse impacts to vegetation from the introduction or spread of nonnative plant species and noxious weeds would be minimized through the implementation of BMPs listed in Table 7. Additional measures to minimize impacts (Section 2.1.4, Best Management Practices) would include minimizing areas of ground disturbance, washing vehicles and equipment prior to entering the project area, and revegetation of temporary construction workspace with a weed-free native seed mix. Therefore, it is unlikely that there would be a readily detectable change in vegetation communities in the project area as a result of the introduction or spread of nonnative plant species and noxious weeds. The potential for effects on general vegetation from nonnative plant species and noxious weeds would be greatest during the 12-month construction period, when numerous vehicle trips to and from the project area would be needed for the delivery of materials and equipment, and from construction workers commuting to the project area. Maintenance activities during operation would be infrequent and there would be very few vehicle trips to and from the project area.

Fugitive dust generated by ground disturbance during construction and operations can repeatedly blanket the foliage of vegetation adjacent to disturbed areas, which can interfere with photosynthesis and reduce plant productivity; however, the amount of dust that must accumulate to result in a measurable effect on plant productivity is far greater than what is typically observed under normal conditions (Thompson et al. 1984). Under the proposed action BMPs (see Section 2.1.4), road watering and a 25-miles per hour (mph) speed limit would be implemented to minimize fugitive dust generation, and the adverse impact to general vegetation from fugitive dust would be minimal. Any effects that do occur would primarily be limited to the 12-month construction period of the BREC

Interconnection Project and the 5-month construction period of the fiber-optic corridor. Little to no ground disturbance would occur during the 40-year operations and maintenance period.

After the 40-year operations and maintenance period, if the BREC were not repowered, the facility would be decommissioned. Grasses, shrubs, and forbs would be expected to recover within a few years of reclamation and revegetation, though it may take many decades to replace any mature trees adversely impacted as a result of the proposed action.

Direct adverse effects on general vegetation during operations and maintenance under the proposed action would be minimal, consisting primarily of trimming, pruning, or removing trees and shrubs to maintain clearances for access roads, the interconnection facilities, and the fiber-optic line.

Disturbance associated with use of access roads would be minimal and primarily from fugitive dust. Adverse effects would primarily be limited to the 12-month construction period. The Kaibab NF would retain control of the existing NFS roads, and these roads would not be removed or reclaimed during decommissioning of the Project.

3.1.2.2 No Action alternative

Under the no action alternative, the interconnection to the NSTS and associated infrastructure would not occur. As discussed in Section 2.2, the BREC access road would still be constructed in the project area. The potential impacts to vegetation from the BREC access road would be similar to those described under the proposed action. The no action alternative would result in some temporary and permanent vegetation disturbances, in particular to the pinyon-juniper woodland within the BREC access road construction footprint.

Indirect effects related to fugitive dust and the potential for the introduction or spread of nonnative plant species and noxious weeds would also be similar, but reduced, when compared to the proposed action. During construction, BMPs would be implemented to conserve or minimize effects on vegetation as implemented for the proposed action. Operations and decommissioning would have similar direct and indirect impacts to those described under the proposed action. Therefore, the no action alternative would have short-term, minimal adverse impacts to vegetation resources along the BREC access road footprint.

3.2 GENERAL WILDLIFE

3.2.1 AFFECTED ENVIRONMENT

The analysis area for wildlife is the project area. Terrestrial wildlife in the project area is typical of those species associated with the Great Basin Conifer Woodland vegetation community. Common mammal species expected within the project area include pinyon mouse (*Peromyscus truei*), bushy-tailed woodrat (*Neotoma cinerea arizonae*), coyote (*Canis latrans*), Rocky Mountain elk (*Cervus canadensis*), pronghorn (*Antilocapra americana*), and mule deer (*Odocoileus hemionus*) (Brown 1994). During general biological field visits on March 28, 2022, and April 26–28, 2022, woodrat middens and black-tailed jackrabbit (*Lepus californicus*) were observed in the project area.

Gopher snake (*Pituophis catenifer*) and whiptail lizard (*Cnemidophorus* sp.) were observed in the project area during general biological field visits. Suitable aquatic habitats for frogs, amphibians, fish, or other aquatic or semi-aquatic species are not present in the project area.

3.2.2 ENVIRONMENTAL CONSEQUENCES

3.2.2.1 Proposed Action

Potential impacts to general wildlife from Project activities could include dispersal of individual animals from the project area or changes in habitat use from the presence of workers and equipment and the associated noise. In addition, disruption of breeding, foraging, or sheltering activities could occur. Impacts from the loss of shelter and foraging habitat in the form of vegetation removal are anticipated. Wildlife could be injured if they were to fall into trenches excavated for buried facilities. Less mobile species could be crushed by vehicles or equipment using access roads or operating within the project area.

Pinyon and juniper trees, shrubs, grasses, and forbs provide shelter and foraging resources for a variety of general wildlife species. The proposed action would directly impact up to 179.5 acres (32.7 acres on Forest Service lands) of wildlife habitat (i.e., vegetation resources) during construction. After construction, the 179.5 acres would be reclaimed. Permanent, direct impacts to vegetation resulting from the Project would be approximately 54 acres, with approximately 10.9 acres located on the Kaibab NF. The pinyon-juniper woodland vegetation community is locally and regionally abundant—with approximately 195,194 acres occurring within the Williams Ranger District alone (Forest Service 2014a)—and the amount of pinyon-juniper woodland vegetation that would be temporarily or permanently impacted by the Project is extremely small in comparison. Therefore, potential direct, adverse impacts to general wildlife habitat from vegetation clearing and grading, and other Project-related activities, would be minor and localized.

During construction, as well as intermittently during operations and maintenance, and during decommissioning, noise and human presence could directly impact general wildlife by temporarily displacing individual animals near the activity area. This disturbance would be short term, and the large areas of habitat available adjacent to the project area would allow individual animals to use nearby habitats. Noise associated with the Project may cause a disruption in wildlife behaviors, including foraging, hunting, roosting, nesting, or breeding during certain times of the year. Large expanses of habitat available adjacent to the project area are of similar quality and composition as that which would be impacted, and disrupted individuals would be able to shift use to these adjacent areas. Potential direct adverse impacts to general wildlife individuals from noise and human presence would be short term, minor, and localized.

After the 40-year operations and maintenance period, if the BREC were not repowered, the facility would be decommissioned. Revegetation and reclamation activities would assist in the rebound of natural habitat for general wildlife species.

3.2.2.2 No Action alternative

Impacts to general wildlife and wildlife habitats under the no action alternative would be limited to the planned BREC access road footprint. During construction and operations, BMPs similar to the proposed action would be implemented to minimize effects on general wildlife, including speed limits on the BREC access road to reduce wildlife impacts. Under the no action alternative, impacts to general wildlife from decommissioning would be similar to the proposed action. Potential direct adverse impacts to general wildlife and wildlife habitat under the no action alternative would be short term, minor, and localized.

3.3 MIGRATORY BIRDS

3.3.1 AFFECTED ENVIRONMENT

3.3.1.1 Migratory Birds

The analysis area for migratory birds is the project area. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA), which prohibits take of any migratory bird or active nest, except as permitted by regulation.

Bird species anticipated to be found throughout the project area are typical of those found in the Great Basin Conifer Woodland (Pinyon-Juniper Woodland) vegetation community, including common raven (*Corvus corax*), pinyon jay (*Gymnorhinus cyanocephalus*), gray flycatcher (*Empidonax wrightii*), gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), juniper titmouse (*Baeolophus ridgwayi*), Scott's oriole (*Icterus parisorum*), and red-tailed hawk (*Buteo jamaicensis*) (Brown 1994).

Field surveys for the project area were conducted by SWCA biologists on March 28, 2022, and April 26–28, 2022. During these surveys, three nests were observed on transmission line towers within the NSTS ROW and were attributed to common raven (two nests) and red-tailed hawk (one nest). All nests were inactive at the time of the survey. Avian species observed during these visits to the project area included common raven, pinyon jay, ash-throated flycatcher (*Myiarchus cinerascens*), lark sparrow (*Chondestes grammacus*), chipping sparrow (*Spizella passeri*na), golden eagle (*Aquila chrysaetos*), horned lark (*Eremophila alpestris*), mountain bluebird (*Sialia currucoides*), northern mockingbird (*Mimus polyglottos*), western meadowlark (*Sturnella neglecta*), ruby crowned kinglet (*Regulus calendula*), violet-green swallow (*Tachycineta thalassina*), vesper sparrow (*Pooecetes gramineus*), house wren (*Troglodytes aedon*), broad-tailed hummingbird (*Selasphorus platycercus*), mourning dove (*Zenaida macroura*), juniper titmouse, Scott's oriole, red-tailed hawk, and Cassin's kingbird (*Tyrannus vociferans*).

3.3.1.2 Bald and Golden Eagles

In addition to protection under the MBTA, bald eagles (*Haliaeetus leucocephalus*) and golden eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA). There is no nesting or foraging habitat present for bald eagle in the project area. An individual golden eagle was observed over the project area during the April 2022 surveys; however, no nesting habitat for the species is

present in the project area. Transmission line structures within the NSTS ROW could be used by golden eagle for nest substrate; however, a species-specific nest survey via helicopter flyover of the power line structures was completed in March 2022, and no eagle nests were observed on the transmission line towers. The project area contains suitable habitat for golden eagle forage species.

3.3.2 ENVIRONMENTAL CONSEQUENCES

3.3.2.1 Proposed Action

Migratory Birds

Potential impacts from the proposed action on migratory birds would be similar to those described for general wildlife in Section 3.2, General Wildlife. During construction, as well as intermittently during operations and maintenance, and during decommissioning, noise and human presence could directly impact migratory birds by temporarily displacing individual birds near the activity area. This disturbance would be short term, and the large areas of habitat available adjacent to the project area would allow individual birds to use nearby habitats. Noise associated with the Project may cause a disruption in bird behaviors, including foraging, roosting, nesting, or breeding during certain times of the year. Large expanses of habitat available adjacent to the project area are of similar quality and composition as that which would be impacted, and disrupted individuals would be able to shift use to these adjacent areas. Potential adverse, direct impacts to migratory birds from noise and human presence would be short term, minor, and localized.

Pinyon and juniper trees, shrubs, grasses, and forbs provide nest substrate and foraging resources for migratory birds. The proposed action would temporarily impact up to 179.5 acres of suitable bird nesting or roosting habitat (i.e., vegetation resources) in areas of ground disturbance for construction of Project facilities. These 179.5 acres would be the subject of reclamation activities after construction. Approximately 54 acres would remain disturbed over the 40-year operations and maintenance period. Direct impacts to vegetation on Kaibab NF lands would be approximately 32.7 acres of disturbance subject to reclamation and 10.9 acres of permanent disturbance. The pinyon-juniper woodland vegetation community is locally and regionally abundant—with approximately 195,194 acres occurring within the Williams Ranger District alone (Forest Service 2014a)—and the amount of migratory bird habitat that would be temporarily or permanently adversely impacted by the Project is extremely small in comparison.

After the 40-year operations and maintenance period, if the Project were not repowered, the facility would be decommissioned, which would entail removing the Project components and returning those sites to a condition as close to a pre-construction state as feasible. After structures and foundations are removed, disturbed areas from decommissioning activities would be recontoured and seeded with a weed-free native seed mix, and suitable bird nesting or roosting habitat (i.e., vegetation resources) would be restored. Approximately 54 acres of disturbance during the operations and maintenance period would be reclaimed and restored. Impacts to migratory birds from decommissioning activities would be similar to construction activities. Decommissioning is anticipated to have negligible adverse impacts on migratory birds. Potential direct, adverse impacts to migratory birds under the proposed action would be short term, minor, and localized.

Bald and Golden Eagles

As there is no nesting or foraging habitat in the project area for bald eagles, the proposed action would have no direct or indirect impact on the species.

Construction activities may remove some habitat for golden eagle prey; however, it would represent a fraction of prey habitat similar to the fraction of vegetation cover described above. The presence of workers may cause golden eagles to avoid the project area; however, activities would occur temporarily on a minimal portion of the available foraging habitat in the vicinity of the project area. Therefore, Project construction activities would have no impact or would have a negligible adverse and localized impact on golden eagles through an insignificant reduction of its prey's habitat.

After the 40-year operations and maintenance period, if the Project were not repowered, the facility would be decommissioned and foraging habitat would be restored. Impacts to bald and golden eagles from decommissioning activities would be similar to construction activities. Decommissioning is anticipated to have negligible impacts to golden eagles and no impacts to bald eagles.

3.3.2.2 No Action alternative

Impacts to MBTA-protected species and golden eagles from vegetation disturbance and noise during construction and operation of the no action alternative BREC access road would be similar to those described for the proposed action but would occur over a smaller area within the project area. Under the no action alternative, no impacts to MBTA-protected species or golden eagles or their nests would occur on Forest Service lands. During construction operations, and decommissioning, similar conservation and minimization measures would be implemented to conserve or minimize effects on migratory birds as the proposed action.

3.4 SPECIAL-STATUS SPECIES: FOREST SERVICE SENSITIVE PLANT SPECIES AND HABITAT

3.4.1 AFFECTED ENVIRONMENT

The analysis area for Forest Service Sensitive plant species and habitat is the project area. A habitat assessment, including field surveys, was conducted to evaluate the potential for Forest Service Sensitive plant species to occur in the project area. The Kaibab NF sensitive plant species list (Forest Service 2013a) was reviewed and compared with the known habitat parameters and ranges of the species to determine the potential for each species to occur in the project area. SWCA biologists conducted site visits on March 28, and April 26–28, 2022, to characterize the physical and biological features, including vegetation, present within the project area. Forest Service Sensitive species are defined in the Forest Service Manual 2670.32 (Forest Service 2005).

The Forest Service's Region 3 Regional Forester's sensitive species lists identified 18 Forest Service Sensitive plant species with the potential to occur in the Kaibab NF. Fourteen of these species were

eliminated from further analysis because the project area is clearly beyond the known geographic or elevational range of the species, or it does not contain vegetation or landscape features known to support those species, or both. The remaining four species that have potential to occur in the analysis area include: Flagstaff beardtongue (*Penstemon nudiflorus*), Mount Dellenbaugh sandwort (*Arenaria aberrans*), Tusayan rabbitbrush (*Chrysothamnus molestus*), and Arizona phlox (*Phlox amabilis*). Surveys of the project area found Arizona phlox in the project area on the Kaibab NF. Within the project area on Forest Service lands, habitat for Arizona phlox was determined to be approximately 3,430 feet of the 8.95 miles (7 percent) of the project area corridor (Figure 5). No other Kaibab NF sensitive plant species were observed. There are four records of Tusayan rabbitbrush in the project area; however, no individuals of this species were observed during April 2022 surveys.

3.4.2 ENVIRONMENTAL CONSEQUENCES

3.4.2.1 Proposed Action

Under the proposed action, potential impacts to Forest Service Sensitive plant species would be similar to those described for vegetation in Section 3.1, Vegetation. Potential direct impacts to sensitive plants on Kaibab NF lands would be primarily due to ground disturbance during construction within the project area. The four sensitive plant species and their habitats may be adversely impacted by the proposed action, but impacts are not likely to result in a trend towards federal listing or loss of population viability.

Ground disturbance during construction and operations and maintenance may indirectly impact Forest Service Sensitive plant species through the introduction or spread of nonnative plant species and reduced productivity due to fugitive dust accumulation. However, potential impacts to sensitive plant species from the introduction or spread of nonnative plant species and noxious weeds would be minimized through the implementation of weed management BMPs. Additional measures to minimize impacts (see Section 2.1.4, Best Management Practices) would include minimizing areas of ground disturbance, washing vehicles and equipment prior to entering the project area, and revegetation of temporary construction workspace with a Forest Service–approved weed-free native seed mix.

Based on the information above, proposed operations and maintenance activities would have no direct impacts to Forest Service Sensitive plant species.

For decommissioning activities, the proposed direct and indirect impacts to Forest Service Sensitive plant species would be similar to those from construction activities discussed above and would consist of working within sensitive plant habitats to remove Project facilities. Therefore, the proposed action decommissioning activities would have negligible adverse, short-term, and localized direct impacts to Forest Service Sensitive plant species.

Figure 5. Locations of Forest Service Sensitive plant species identified within the project area.

3.4.2.2 No Action alternative

Under the no action alternative, no construction would take place on Forest Service lands and therefore, there would be no direct or indirect impacts to Forest Service Sensitive plant species and habitat. Refer to Section 3.1, Vegetation, for analysis of impacts to vegetation from the no action alternative.

3.5 SPECIAL-STATUS SPECIES: FOREST SERVICE SENSITIVE WILDLIFE

3.5.1 AFFECTED ENVIRONMENT

The analysis area for Forest Service Sensitive wildlife is the project area. The project area is within the Great Basin Conifer Woodland biotic community, as described in Section 3.1, Vegetation. Vegetation is typical of the Great Basin Conifer Woodland biotic community and is a mix of pinyon-juniper woodland and grassland. SWCA biologists conducted visits on March 28, 2022, and April 26–28, 2022, to characterize the physical and biological features, including Forest Service Sensitive wildlife species and associated habitat, present within the project area.

The Forest Service's Region 3 Regional Forester's Sensitive Species lists identified 12 Forest Service Sensitive wildlife species with the potential to occur in the Kaibab National Forest. Six of these were removed from analysis because the project area is outside the known geographic range for the species or does not contain suitable habitat. The remaining six Forest Service Sensitive species potentially occurring in the project area are American peregrine falcon (*Falco peregrinus anatum*), northern goshawk (*Accipiter gentilis*), western burrowing owl (*Athene cunicularia hypugaea*), Allen's lappet-browed bat (*Idionycteris phyllotis*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), and spotted bat (*Euderma maculatum*) (Table 8).

Table 8. Forest Service Sensitive Wildlife Species Potentially Occurring in the Project Area

Range or habitat information is from AZGeo Data Hub (2022); Brennan and Holycross (2006); Corman and Wise-Gervais (2005); Cornell Lab of Ornithology (2022); NatureServe (2022); SEINet (2022); Forest Service Sensitive species annotated list (Forest Service 2013a); USFWS IPaC (USFWS 2022a); and Vaughn (2011).

Common Name (Species Name)	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Birds			
American peregrine falcon (*Falco peregrinus anatum*)	Occurs in forested habitats near sheer cliffs, particularly next to riparian forests.	May occur. The project area is adjacent to suitable foraging habitat for this species and is within the species' known geographic range. No nesting habitat occurs in the project area.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability. Because Project activities would be short term and occur over a very small area, impacts occurring from construction noise or from loss of foraging habitat would be extremely minor.
Northern goshawk (*Accipiter gentilis*)	Occupies a wide variety of forest types including deciduous, coniferous, and mixed forests. Typically nests in mature or old-growth forests, commonly in ponderosa pine.	May occur. The project area is adjacent to suitable foraging habitat for this species and is within its known geographic range. No nesting habitat occurs in the project area. No post-fledging family areas occur in or near the project area. The nearest record is about 4.5 miles from the project area. The project area is constrained to a relatively narrow ROW and effects would be minor and localized.	May impact individuals but is not likely to result in a trend toward federal listing or loss of viability. Because Project activities would be short term and occur over a very small area, impacts occurring from construction noise or from loss of foraging habitat would be minor.

Common Name (Species Name)	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Western burrowing owl (*Athene cunicularia hypugaea*)	Lives in open, treeless areas with low, sparse vegetation, usually on gently sloping terrain. The owls can be found in grassland, deserts, and steppe environments; on golf courses, pastures, agricultural fields, airport medians, and road embankments; and in cemeteries and urban vacant lots.	May occur. No burrows suitable for burrowing owl were observed within the project area. However, the project area and vicinity contain open, treeless areas with sparse vegetation suitable for this species.	No impact. Because Project activities would be short term and occur over a very small area, impacts from construction noise or from loss of foraging habitat would be extremely minor. No nests or owls were observed at the time of survey; however, if a burrowing owl burrow is found to be present prior to construction, it should be avoided to comply with the MBTA.
Mammals			
Allen's lappet-browed bat (*Idionycteris phyllotis*)	Inhabits desert scrub through ponderosa forest zone with mountains and cliffs.	May occur. Although the project area does not contain suitable roosting habitat for this species, it may be present intermittently while foraging. The project area is within the known geographic range for this species.	No impact. Construction noise would occur during the day and not when this nocturnal species would potentially be foraging. Construction activities would not impact habitat elements known to be used by the species.
Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)	Found in desert scrub, oak woodland, oak-pine, piñon-juniper, and coniferous forests. Roosts in caves and mines from desert scrub up to woodlands and coniferous forests. Roosts in abandoned buildings, cold caves, lava tubes, and mines.	May occur. Although the project area does not contain suitable roosting habitat for this species, it may be present intermittently while foraging. The project area is within the known geographic range for this species.	No impact. Construction noise would occur during the day and not when this nocturnal species would potentially be foraging. Construction activities would not impact habitat elements known to be used by the species.

Common Name (Species Name)	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Spotted bat (*Euderma maculatum*)	Occupies various habitats from desert scrub to montane coniferous stands including ponderosa pine, pinyon-juniper woodland, canyon bottoms, open pasture, and hayfields. Roosts in caves and in cracks and crevices in cliffs and canyons, with which this species is consistently associated.	May occur. Although the project area does not contain suitable roosting habitat for this species, it may be present intermittently while foraging. The project area is within the known geographic range for this species.	No impact. Construction noise would occur during the day and not when this nocturnal species would potentially be foraging. Construction activities would not impact habitat elements known to be used by the species.

3.5.2 ENVIRONMENTAL CONSEQUENCES

3.5.2.1 Proposed Action

Potential direct and indirect impacts on Forest Service Sensitive wildlife species would include impacts from construction, operations and maintenance, and eventual decommissioning of the proposed action. Potential direct impacts during construction would include permanent loss of wildlife habitat, including the loss of trees and shrubs associated with the construction and maintenance of transmission pole structures and substation, primarily in the areas of ground disturbance. Other direct impacts on sensitive wildlife species could include a temporary increase in noise from construction and maintenance activities.

The potential direct impacts from construction activities would generally occur where ground disturbance is planned for access roads, utility pole locations, the substation, and other Project features in the Kaibab NF. An estimated total of 32.7 acres of direct temporary disturbance and 10.9 acres of permanent disturbance to vegetation resources would result from construction activities, which could have both direct and indirect impacts on Forest Service Sensitive wildlife species. As described in Table 7, these temporary vegetation impacts would be mitigated by implementing BMPs. Therefore, direct impacts resulting from the construction of the proposed action would be mitigated to reduce impacts to Forest Service Sensitive wildlife resources.

Potential direct adverse impacts on Forest Service Sensitive wildlife species during operations and maintenance activities would occur primarily from an increase in temporary noise disturbances and an increase in traffic resulting in collisions. These activities would be temporary and minimal as they would occur on access roads, ROWs, and overhead facilities (i.e., transmission cable). Therefore, the proposed action operations and maintenance activities would have short-term, minor, and localized direct impacts on sensitive wildlife species.

Both direct and indirect impacts on Forest Service Sensitive wildlife species during Project decommissioning activities would consist of similar direct and indirect effects as those described above for operations and maintenance of the proposed facilities. Therefore, the proposed action decommissioning would have short-term, adverse, but minor and localized direct impacts on Forest Service Sensitive wildlife species.

3.5.2.2 No Action alternative

Under the no action alternative, no construction would take place on Forest Service lands and therefore, there would be no direct or indirect impacts to Forest Service Sensitive wildlife. Refer to Section 3.2, General Wildlife, for analysis of impacts to general wildlife and wildlife habitat from the no action alternative.

3.6 CULTURAL RESOURCES

3.6.1 AFFECTED ENVIRONMENT

This section describes the cultural resources identified within the project area and cultural resource analysis areas. The cultural resources analysis area for direct impacts is the project area; the analysis area for indirect impacts is a 3-mile radius around the project area. These analysis areas were selected to represent the area in which cultural resources may be impacted as a result of implementing the proposed action.

Of primary concern to this discussion are the potential impacts to historic properties, which are cultural resources that are listed in or eligible for inclusion in the National Register of Historic Places (NRHP) as defined by the implementing regulations (36 CFR 800) of the National Historic Preservation Act (NHPA). The NRHP contains a variety of property types, including buildings, structures, sites, districts, and objects, which reflect significance in architecture, history, archaeology, engineering, and culture. Traditional cultural properties are properties significant for their association with "the cultural practices or beliefs of a living community that are (a) rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1992:1). There are currently no known sacred sites or properties of traditional cultural significance within the current project area or analysis areas. Properties may be identified during future consultation. The San Francisco Peaks, located approximately 20 miles southeast, are considered sacred to the Hopi, Diné (Navajo), Western Apache, Havasupai, Hualapai, Yavapai, Zuni, Southern Paiute, Acoma, Mojave, and many other tribal communities. Red Butte, approximately 10 miles to the northwest, is known to be of cultural and traditional importance to many affiliated tribal communities, particularly the Havasupai Tribe. Other natural landmarks such as SP Crater and Gray Mountain could hold similar cultural importance. In general, tribal groups have expressed the opinion that archaeological sites represent the footprints of their ancestors' travels, and all have significant traditional value.

The process for identifying historic properties that have the potential to be affected by the proposed Project began with a cultural resources records review of the project area (coinciding with the

analysis area identified for direct impacts) and the 3-mile radius around the project area (coinciding with the analysis area identified for indirect impacts). In addition to the records review, a full-coverage pedestrian survey (Class III survey) was conducted of the project area (i.e., the analysis area for direct impacts). The Class III survey of the BREC Interconnection Project components in Table 4, Section 2.1.1.1, BREC Interconnection Project Construction Components, was conducted between the fall of 2020 and the spring of 2022 (Barr et al. 2022). The preliminary results of all cultural resource surveys in the project area are provided in this section.

The Class III pedestrian survey of the project area resulted in the documentation of 31 previously recorded cultural resources, 17 newly recorded cultural resources, and 258 isolated occurrences within the BREC Interconnection Project survey area. Of these, 44 are archaeological sites and four are in-use historical-period linear structures. Of the identified archaeological sites, 36 are prehistoric, five are historic era, and three are of unknown temporal/cultural affiliation. The cultural resources reflect a mixture of Archaic, Cohonina, Diné (Navajo), and historical-period Euro-American uses associated with resource procurement, habitation, ranching, and transportation. **Error! Reference source not found.** in Appendix A summarizes the resources identified during survey.

In the 3-mile analysis area identified for indirect impacts, a total of 79 pedestrian surveys have been conducted, covering approximately 8 percent of the analysis area. These past investigations identified 361 cultural resources, excluding those in the project area (Table A.2 in Appendix A), including several NRHP-eligible archaeological sites. Of these, 325 are archaeological sites and 36 are of unknown resource type due to an absence of available data. Of the known archaeological sites, 297 are prehistoric, 20 are historic era, and eight are multicomponent. The cultural resources reflect a mixture of Archaic, Cohonina, Sinagua, Diné (Navajo), Hopi, Pai, Basque, and Euro-American uses associated with resource procurement, habitation, ranching, sheepherding, as well as other traditional uses by tribal groups.

3.6.2 ENVIRONMENTAL CONSEQUENCES

3.6.2.1 Proposed Action

Project construction would require ground-disturbing activities (i.e., grading, blading, trenching, auger holes, etc.) for the components listed in Table 4. Construction activities have the potential to directly affect 40 cultural resources identified within the project area. One of these is listed in the NRHP (the Grand Canyon Railway), 35 of these are NRHP-eligible and four are unevaluated or of indeterminate eligibility (requiring archaeological testing), and therefore, considered NRHP-eligible for the purposes of this analysis. The Project would avoid direct and indirect effects on historic properties and would facilitate avoidance by (1) developing a Monitoring and Discovery Plan for agency approval; (2) placing fiber-optic line poles outside the boundaries of cultural resources (also called spanning); (3) fencing or flagging a 50-foot buffer around cultural resources during construction of the substation, interconnection, collection lines, and access roads; (4) having an archaeologist monitor ground-disturbing activity that occurs within 50 feet of site boundaries; (5) importing earthen material from an ADOT-approved borrow source; and (6) providing awareness training to construction workers. Project operations and decommissioning would have

no impacts to known cultural resources as the Proponent has committed to avoidance of cultural resources using the strategies detailed above.

The proposed fiber-optic line would cross the in-use Grand Canyon Railroad, in-use Beale Wagon Road, in-use SR 64, and the in-use APS Williams-Grand Canyon Transmission Line. These in-use historical-period structures would be spanned by the fiber-optic line. All of these in-use historical-period structures have been determined eligible for or have been listed in the NRHP and constitute historic properties. The fiber-optic line (including the wooden poles) would be constructed in a manner that would reduce the contrast between the recently constructed infrastructure and the existing setting. These in-use historical-period structures would be briefly crossed by the fiber-optic line. Based on the presence of other overhead and linear structures across the landscape and adjacent to the fiber-optic line structures, the proposed Project would not introduce any incompatible elements that are not already present. Therefore, there would be no adverse indirect impacts to the setting or integrity of these in-use historic properties by the addition of the fiber-optic line.

Most historic properties within the 3-mile analysis area identified for indirect impacts are prehistoric habitation sites. Because Project components are similar to existing infrastructure, the overall changes to the landscape as a result of the fiber-optic line, although long term, would not be visually substantial. There would be no impacts to historic properties in the 3-mile analysis area that would constitute an adverse effect to setting.

3.6.2.2 No Action alternative

Under the no action alternative, Reclamation would not approve the proposed interconnection to the NSTS and the BREC would interconnect with the Moenkopi to Eldorado 500-kV transmission line using a non-federal alternative interconnection (see Figure 4). There are two prehistoric sites within the vicinity of the BREC access road but located outside of the planned construction footprint. Similar to that described in the proposed action, the Proponent has committed to avoidance of cultural resources, and implementation of the BMPs outlined in Table 7 would apply; therefore, no direct or indirect impacts to cultural resources would be anticipated from the no action alternative.

3.7 LAND USE AND GRAZING

3.7.1 AFFECTED ENVIRONMENT

The analysis area for land use and grazing is the project area. The analysis area is within unincorporated portions of Coconino County and contains a checkerboard of private, ASLD, and Kaibab NF–managed lands (see Figure 1). Table 9 provides a breakdown of the project area by land ownership. Land ownership along the 25-mile-long fiber-optic corridor includes 8.9 miles of Kaibab NF–managed lands, 9.0 miles of ASLD lands, and 8.9 miles of private lands. The primary land uses in the analysis area include grazing and the existing 300-foot-wide NSTS ROW.

Table 9. Project Area by Land Ownership

Landowner	Acreage	Percentage
Forest Service (Kaibab NF)	361	34 percent
ASLD	432	40 percent
Private land	284	26 percent
Total	**1,077**	**100 percent**

The Coconino County Comprehensive Plan (Coconino County 2015) covers all areas of the county, although the County's jurisdiction over land use only applies to unincorporated, privately held (fee-simple) land. Part of the analysis area falls within the Valle Planning Area. Primary uses of public lands (Forest Service and ASLD lands) are grazing, recreation, fuelwood cutting, and hunting, with the majority of ASLD lands used for grazing (Coconino County 1999). The Forest Plan (Forest Service 2014a) manages livestock grazing allotments to balance livestock numbers with forage capacity. Approximately three-quarters of private land in Coconino County consists of large ranches (Coconino County 2015).

The private land surrounding the project area is zoned General (G), which is a rural land use designation for unincorporated areas of the county not specifically designated for any other zone classification. This zoning classification permits single-family residential use and agricultural and ranching uses (Coconino County 2019). The only permitted land uses are those considered complementary and compatible with a rural environment. There is no residential land use within the analysis area (project area). Refer to Section 3.8.1 for a discission of residential uses within 0.5 mile of the project area. Currently there are no specific standards within County zoning ordinances to guide renewable energy development (Coconino County 2022).

Land cover for the project area is undeveloped rangeland (see Section 3.1, Vegetation, for additional information). The project area contains two Forest Service and five ASLD grazing allotments (Table 10). State utility and transportation ROWs comprise approximately 338 acres or 28 percent of the project area, with APS having 97 percent of that (see Table 10). The project area also contains approximately 28 miles of existing roads on Forest Service, ASLD, and private lands.

Table 10. Land Uses in the Project Area

Land Use	Acreage	Percentage of Project Area
Grazing/Rangeland		
Forest Service Allotment – Smoot Lake	285.5	26.5 percent
Forest Service Allotment – Ebert	76.7	7.1 percent
Five ASLD Allotments	714.7	66.4 percent
Total Grazing	**1,076.9**	**100 percent**
State Right-of-Way		
Arizona Public Service	322.5	26.8 percent
Arizona Department of Transportation	2.1	0.2 percent

Land Use	Acreage	Percentage of Project Area
Coconino County	1.1	0.1 percent
AT&T Corp.	4.0	0.3 percent
Other utility projects	3.1	0.3 percent
Total Right-of-Way	**332.5**	**27.6 percent**

Source: AZGeo Data Hub (2020, 2022).

Note: Sums may not add up exactly due to rounding.

3.7.2 ENVIRONMENTAL CONSEQUENCES

3.7.2.1 Proposed Action

The interconnection components would be consistent with County plans and regulations and would not result in conflicts with existing land use plans and policies per the Coconino County–approved Conditional Use Permit (CUP) for the BREC, issued on September 29, 2021. The Project would not result in changes to land ownership as the Proponent would enter into lease agreements with private landowners and APS would obtain a special use authorization from the Forest Service as described in Section 2.1.1.2, Forest Service Special Use Permit. The Proponent and APS would also obtain use authorization from the ASLD for the portions of the proposed action occurring on ASLD lands. The interconnection access road would be constructed parallel to the NSTS ROW on private lands and ASLD lands and the road would be included in Proponent's leased area. The fiber-optic line and new fiber-optic line access roads would be located within existing NSTS ROW and would be consistent with existing utility uses of that ROW. Additionally, APS holds a ROW for the existing access roads that would be used to access the NSTS ROW.

The Project would result in minor, adverse, temporary, and permanent impacts to land cover and grazing. Table 5 provides estimated acres of temporary and permanent disturbance associated with each Project component. Construction of the proposed action would result in temporary changes to land cover from ground-disturbing activities and grazing exclusion. As described in Section 3.1, Vegetation, approximately 233.41 acres of vegetation would be impacted during construction, with 179.5 acres being reclaimed post-construction. Livestock grazing would need to be restricted within the project area until after construction is complete to allow vegetation to reestablish. As part of the proposed action, fencing and signage would be posted prior to construction to inform the public and ranch users of construction activities. Grazing exclusion would be accomplished per the terms of the private land lease agreements and through coordination with the Forest Service and ASLD grazing permittees.

Table 5Table 7During operations, land use in the areas of permanent disturbance (53.91 acres) would be altered from undeveloped rangeland to utility and access road use. The substation and switchyard components would also be fenced during operations, further disallowing any potential grazing activities. No changes to the existing grazing allotments or grazing activities outside of the temporary and permanent grazing exclusions are proposed.

At the end of the 40-year life of the BREC, the Project would be decommissioned. After successful reclamation and revegetation, the project area would return to pre-Project land cover and land uses, which are predominantly grazing.

3.7.2.2 No Action alternative

Under the no action alternative, Reclamation would not approve the proposed interconnection to the NSTS and the BREC would interconnect with the Moenkopi to Eldorado 500-kV transmission line using a non-federal alternative interconnection (see Figure 4). Impacts to land use and grazing under the no action alternative would be similar to those described under the proposed action for the BREC access road. Direct, adverse impacts would include localized temporary and permanent changes in land use and grazing from construction and operations of the BREC access road.

3.8 NOISE

3.8.1 AFFECTED ENVIRONMENT

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

The general human response to changes in noise levels that are similar in frequency content (such as comparing increases in continuous [Leq] traffic noise levels) are summarized as follows:

- A 3-decibel (dB) change in sound level is considered a barely noticeable difference.
- A 5-dB change in sound level typically is noticeable.
- A 10-dB increase is considered a doubling in loudness.

Community sound levels are generally presented in terms of A-weighted decibels (dBA). The A-weighting network measures sound in a fashion similar to how a person perceives or hears sound, thus achieving a strong correlation with how people perceive acceptable and unacceptable sound levels. Appendix A, Table A.3 presents A-weighted sound levels and the general subjective responses associated with common sources of noise in the physical environment.

As a result of the Noise Control Act of 1972, the EPA developed standards for noise levels under various conditions that would protect public health and welfare with an adequate margin of safety. The EPA determined that outdoor day-night average sound levels (Ldn) less than or equal to 55 dBA are sufficient to protect public health and welfare in residential areas and other places where quiet is a basis for use; and this level (Ldn of 55 dBA) as the level below which no adverse impact occurs. An Ldn of 65 dBA represents a compromise between community impact and the need for construction. As such, that level is commonly used for noise planning purposes (EPA 1974).

Sound propagation, or how sound travels, is affected by terrain and the elevation of the receptor relative to the noise source. From level ground, noise travels in a straight path between the source and receptor. Breaking the line-of-sight between the receptor and the noise source can affect noise levels; examples include a traffic noise source at a certain elevation and a receptor at a higher elevation and vice versa. Each doubling of the distance from the source of a noise decreases the sound pressure level by 6 dBA at distances of more than 50 feet (New York Department of Environmental Conservation 2001).

To date, the State of Arizona and Coconino County have no noise regulations or noise standards. Coconino County zoning classifies the project area as a residential land use category intended to accommodate rural lifestyles, including ranches and agricultural land uses (Coconino County 2019). The Coconino County Comprehensive Plan (Coconino County 2015) notes goals and policies to consider noise impacts when reviewing development projects (Community Character Policies 41, 42 and 44), including the siting of utility-scale projects and transmission lines which should consider the potential for noise disturbances to adjacent residential areas (Energy Policy 14) (Coconino County 2015).

The project area is in a rural unincorporated region in Coconino County. In rural areas, typical outdoor Ldn values typically range between 35 and 50 dB (EPA 1974), which range from very quiet to moderate quiet (see Appendix A, Table A.3). Ambient noise surrounding the project area consists predominantly of rural or natural sounds and vehicle traffic on U.S. 180 and local roads. Noise-sensitive receptors include residences, schools, churches, hospitals, and parks. There are 18 residences within 0.5 mile of the project area (Table 11 and Figure 6). There are no schools, churches, hospitals, or parks within 0.5 mile of the project area. All the sensitive receptors are along the proposed fiber-optic corridor. The closest sensitive receptor is approximately 470 feet northwest of the closest work area in the vicinity of pole ID 364. There are three additional residences within 1,000 feet of the project area (531, 878, and 909 feet, respectively). The closest sensitive receptor to the substation portion of the Project is approximately 7.3 miles.

Table 11. Noise Sensitive Receptors within 0.5 mile of the Project Area

Noise Sensitive Receptor Types	Distance Range	Number
Residences	<500 feet	1
Residences	501 – 1,000 feet	3
Residences	1,000 – 1,500 feet	4
Residences	1,501 – 2,000 feet	5
Residences	2,000 – 2,640 feet	5
Total	**<2,640 feet**	**18**

Source: Coconino County Open Data (2021)

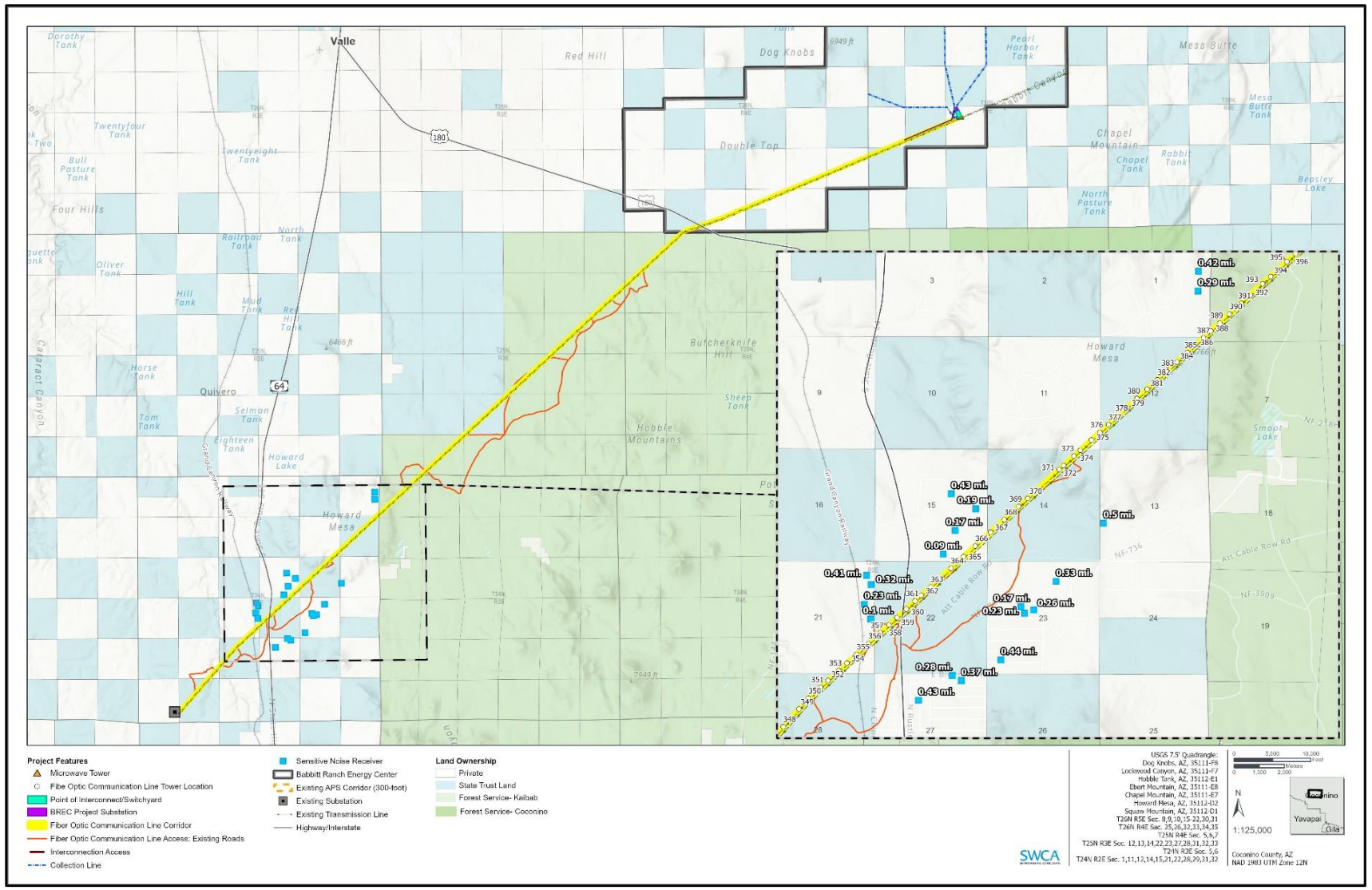

Figure 6. Sensitive noise receptors in relation to the proposed action.

3.8.2 ENVIRONMENTAL CONSEQUENCES

3.8.2.1 Proposed Action

A direct, short-term increase in noise related to construction activities would result from the proposed action. This impact would be temporary and localized, occurring only during daylight hours (presumably during an 8- to 10-hour workday) within the 12-month construction period for the BREC Interconnection Project and 5-month construction period for the NSTS fiber-optic cable. The use of construction equipment would increase ambient noise levels. Noise levels generated by construction would vary daily and hourly, depending on the construction activity and the type, age, and numbers of equipment in operation.

Table 12 provides a list of vehicles and construction equipment used for Project construction. Most construction sounds are in the 80- to 90-dBA range (American National Standards Institute 2018). Additionally, noise resulting from construction would vary with the type of work being done, the distance between the work and the receptor, and meteorological conditions. Noise resulting from increased construction vehicle traffic would also occur. Over a 5-day work week, heavy truck trips would average 59 per day for the interconnection components, and 4.4 per day for APS fiber-optic cable. Worker and material delivery commutes would also result in short-term noise but would have little effect on hourly average noise levels in proximity of the project area.

Table 12Table 12Table 12Table 12The closest sensitive receptor to the project area is approximately 470 feet to the edge of the work area for the fiber-optic corridor, which is slightly below the estimated sound levels for 500 feet, as shown in Table 12. Construction-related noise would range between slightly above 61 dBA and 68 dBA during the busiest periods of activity at the closest sensitive receptor. The noise level at the closest sensitive receptor would range from the sound of air conditioning at 20 feet to a vacuum cleaner at 3 feet, which is considered loud/intrusive (see Appendix A, Table A.3). Since the equipment is transient in nature, it is anticipated that construction noise would be less than the EPA's Ldn of 65 dBA, would be temporary during construction, and would occur only during daytime hours when residential land uses are less sensitive to noise intrusions. Therefore, there would be no adverse noise levels (higher than 65 dBA) from construction at the closest sensitive receptor.

The loudest contributor to ambient noise conditions relative to the Project would be from helicopter delivery of equipment and materials during construction. The total time that a helicopter would be used at these pole locations is approximately 1 hour. The helicopter may travel back and forth between sites and staging yards multiple times within this time frame. Depending upon the specific needs, Project-related helicopter activities for the construction of the fiber-optic line could occur across the entire 25-mile-long corridor. Helicopter use would be required at pole locations 390 and 391. The two closest sensitive receptors to these pole locations are approximately 1,800 and 2,500 feet.

Table 12. Noise Levels from Common Construction Equipment

Construction Equipment	Typical Sound Pressure Level (dBA)				
	50 feet	100 feet	500 feet	1,500 feet	3,000 feet
Dozer (250–700 horsepower)	88	82	68	58	52
Front-end loader (6–15 cubic yards)	88	82	68	58	52
Trucks (200–400 horsepower)	86	80	66	56	50
Grader (13–16 feet blade)	85	79	65	55	49
Shovels (2–5 cubic yards)	84	78	64	54	48
Portable generators (50–200 kilowatts)	84	78	64	54	48
Derrick crane (11–20 tons)	83	77	63	53	47
Mobile crane (11–20 tons)	83	77	63	53	47
Concrete pumps (30–150 cubic yards)	81	75	61	51	25

Source: Adapted from Table 4.53. Noise Levels from Common Construction Equipment (EPA 1971 and Barnes et al. 1976, as cited in BLM 2011).

Notes: These typical noise levels at distances away from the pieces of equipment (beyond 50 feet) are conservative because the only attenuating mechanism considered was divergence of the sound waves in open air. In general, this mechanism results in a 6-dBA decrease in the sound level with every doubling of distance from the source. For example, the 84-dBA average sound level associated with generators would be attenuated to 78 dBA at 100 feet, 72 dBA at 200 feet, 66 dBA at 400 feet, and so forth. Attenuation from air absorption, ground effects, and shielding from intervening topography or structures are not included in determining these nominal values. Further, use of these data is considered to be conservative because construction equipment producers have striven to produce quieter models to protect operators from exposure to high noise levels and the community from undue noise intrusion.

Post-construction, the ambient sound environment would be expected to return to existing levels. Operations and maintenance activities (e.g., preventative maintenance, unplanned maintenance, and inspections) would occur throughout the operational life of the Project. These activities would occur infrequently, ranging from a 6-month basis (for the interconnection components) to every 3 to 5 years (for the fiber-optic line). Up to four personnel would conduct the routine maintenance for the BREC Interconnection Project. Equipment used would typically consist of passenger vehicles and light-duty trucks. Traffic noise associated with operations and maintenance activities would be negligible and would not result in increases to existing ambient noise levels. Consequently, the Project would cause only temporary noise impacts and would not result in a long-term increase in the ambient noise levels of the area. No permanent noise-related impacts to sensitive noise receptors are anticipated.

After the 40-year life of BREC, the Project would be decommissioned. Noise impacts associated with decommissioning would be similar and less than those described as during construction. Equipment similar to those used for construction would be used and would produce similar noise

levels. Traffic associated with decommissioning activities would be at similar levels as during construction. These adverse impacts would be short term, localized, and minor.

3.8.2.2 No Action alternative

Under the no action alternative, impacts would be limited to construction of the BREC access road and noise associated with construction of the BREC. There are no sensitive receptors identified within 0.5 mile of the BREC access road (see Figure 6). Similar to that described under the proposed action, construction of the BREC access road would result in direct adverse, temporary, localized increases to ambient noise levels during the construction period. Noise impacts during operations and maintenance use of the BREC access road would be negligible. Decommissioning would also result in similar noise impacts as described under the proposed action. The no action alternative would not result in a long-term increase in the ambient noise levels of the area and no permanent noise-related impacts to sensitive noise receptors are anticipated.

3.9 SOILS

3.9.1 AFFECTED ENVIRONMENT

The analysis area for soils is the project area, which encompasses the areas where ground disturbance from Project activities would occur and affect soil resources.

Soils data for portions of the project area on ASLD and private lands were obtained from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2022a), Soil-Web ScienceBase Catalog (University of California, Davis 2022) and the Soil Survey of Coconino County: Central Part (NRCS 1983). Soils data for Forest Service land were obtained from Terrestrial Ecosystem Survey of the Kaibab National Forest (Forest Service 1991) and associated digital files. Note that the NRCS identifies soils by a common name, while the Forest Service identifies soils by Terrestrial Ecosystem Unit and uses scientific names.

Twenty-five mapped soil units are represented within the project area as shown in Appendix A, Table A.4. These include units dominated by a single soil type; geographic associations of two or more soils; and complexes of two or more soils in a pattern too intricate to map individually.

Aerial imagery shows the project area is rangeland with limited impacts from the existing dirt roads, two paved highways, and an existing extra-high voltage corridor. No soils in the project area are identified as prime farmland or farmland of unique importance and none are currently under cultivation. There are no hydric soils (soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper layers [NRCS 2022b]). Soils within the project area are used as rangeland or grazeable woodland. Ziegler soils are a potential source of cinder gravel, although no gravel extraction is evident within the project area.

Soils in the project area have some limitations for development, including shallow depth to bedrock, shrink-swell potential which may damage built structures, the inclusion of stone and stony surfaces, and ground slope in some areas. A small portion of the project area—1.1 percent (13.5 acres of Aut-Lynx association)—is identified as potentially subject to seasonal flooding. However, no mapped floodplains are present in the project area. Certain soils in the project area are susceptible to erosion. Erosion is the detachment and removal of soil resulting from water or wind action. Erosional processes may be natural but may also be caused or accelerated by human action. Water may remove soil in sheet erosion—the more-or-less uniform removal of soil from the surface, or in rill and gully erosion when runoff cuts conspicuous channels in the soil. Wind erosion is the physical wearing of the earth's surface by wind. Erosion results in the loss of topsoil, which contains organic matter, nutrients, and hosts biological activity. Natural soil properties are a factor in erosion hazard (see Appendix A, Table A.4). Generally, sandy or clayey soils are less susceptible to erosion than silty soils, although sandy soils weathered from granitic rock are highly erodible. Most soils in the project area have slight or slight-moderate erosion potential, and 1.5 percent have moderate erosion potential. Soils which are more susceptible to erosion occur in small portions of the project area. Palma soils—found in 27.9 acres (2.3 percent of the project area)—are highly susceptible to wind erosion. Sevilleta soils—found in 54.5 acres (4.5 percent of the project area) are highly susceptible to water erosion. On Forest Service land, the Pachic Argiustolls in Terrestrial Ecosystem Unit 36 are severely susceptible to erosion, specifically gully erosion when flood, which would be an infrequent occurrence, following heavy rain. These soils are found in in 37.2 acres (3.1percent) of the project area.

Soil compaction—which occurs when soil particles are pressed together by the weight of animals, machinery, or vehicles—is also a concern. The risk of soil compaction is greatest when soils are wet. Compaction reduces soil productivity and may contribute to erosion beyond the area of compacted soil.

3.9.2 ENVIRONMENTAL CONSEQUENCES

3.9.2.1 Proposed Action

The proposed action would result in 233.41 acres of disturbance to soils within the project area, including temporary impacts during construction and decommissioning and permanent impacts where soils are covered by facilities during the anticipated 40-year life of the Project. The Project would result in approximately 179.5 acres of temporary disturbance, and 53.91 acres of permanent disturbance (see Table 5).

Direct adverse impacts to soil resources would include wind and water soil erosion, compaction, and loss of soil structure and stability, resulting in loss of soil productivity. Indirect adverse construction impacts to soils could include increased stormwater runoff emanating from compacted soils or impermeable surfaces in the Project, which could result in the formation of rills and gullies across extending erosion outside the project area. BMPs (see Table 7) designed to minimize or mitigate direct and indirect effects on soils within the project area would be implemented to reduce impacts.

Approximately 179.5 acres of temporary disturbance is anticipated during construction. Construction activities such as vegetation clearing, grading, and trenching may increase erosion by destabilizing the soil surface. Soil compaction could result from the movement of heavy equipment and construction of access roads, including the interconnection access road and fiber-optic line access roads. Installation of the underground electrical collection lines would result in temporary soil disturbance from trench excavation. These would then be backfilled after construction. Excavation would be limited for construction of overhead lines where poles would be installed by auguring. The overhead fiber-optic cable would be installed in an existing NSTS ROW. Therefore, only minimal additional soil disturbance would occur along the fiber-optic line. Construction would also require temporary use of pulling and tensioning areas, and one laydown area (for storage of materials and equipment). The ground surface in these areas would be cleared and disturbed during construction but the temporary disturbance areas would be revegetated after construction.

Operations and decommissioning of the Project facilities would not result in additional surface disturbance. Existing access roads would be used to access the Project components during operations. Project facilities including the substation, switchyard, line tap facility, and microwave tower would cover soils for the duration of the Project, resulting in permanent impacts to 53.91 acres. These facilities would be removed when the Project is decommissioned, and the land would be reclaimed. Forest Service–approved native seed mix would be used to encourage revegetation of the reclaimed land. Therefore, potential direct adverse impacts to soils would be short term, minor, and localized.

3.9.2.2 No Action alternative

Under the no action alternative, impacts would occur within the BREC access road corridor. Construction of the BREC access road would result in direct, adverse, temporary soil disturbance within the construction footprint due to the potential for soil compaction and soil erosion. Similar to the proposed action, BMPs would be implemented during construction to minimize or mitigate effects on soils. Decommissioning of the Project would result in negligible additional surface disturbance for the no action alternative.

3.10 TRANSPORTATION

3.10.1 AFFECTED ENVIRONMENT

The transportation analysis area for direct and indirect effects is a 5-mile radius around the project area. The analysis area includes a network of paved and unpaved roads. Paved access roads to be used by the Project include U.S. 180 and SR 64. U.S. 180 is a two-lane roadway which connects the communities of Valle and Flagstaff, Arizona, and is classified as an urban major collector (ADOT 2022a). SR 64 is two-lane roadway which provides transportation access between the Grand Canyon to the north and Interstate 40 to the south and is classified as an urban principal arterial. Unpaved roads to be used by the Project consist of the interconnection access road, the BREC access road, existing roads within the NSTS ROW, two-track roads on ASLD lands, and Forest Service roads, including a portion Forest Service Road 2020. Remaining roadways within Forest Service lands are unnamed. These unpaved roads are associated with access to linear utilities,

including the existing NSTS ROW, and dispersed recreation activities on ASLD lands, and within Forest Service lands. The Project would not use residential access roads.

The Project's substation, switchyard, microwave tower, line tap facilities, and underground electrical collection lines would be accessed during construction and operations from U.S. 180 via the proposed BREC access road, then the interconnection access road. The proposed BREC access road would originate from U.S. 180 at approximately milepost 255.

During construction and operations, access for the fiber-optic cable between the Cedar Mountain substation to the APS line tap would occur along the existing 300-foot NSTS ROW, and access to the NSTS ROW would occur at U.S. 180 and from SR 64, near milepost 199. Existing access roads would be used as much as possible but would be improved within the existing road apron as described in Section 2.1.1.7, Access Roads. Construction of new permanent access roads on Forest Service lands would occur within the existing NSTS ROW as described in Section 2.1.1.7, Access Roads.

ADOT logged average annual daily traffic (AADT) counts on U.S. 180 and SR 64 in 2020 (ADOT 2022b). The AADT for U.S. 180 near the analysis area (milepost 240.84) located between SR 64 and Valle was 1,001 vehicles. Counts for SR 64 (milepost 199) located within the analysis area include an AADT of 4,618 vehicles, and an AADT of 4,305 vehicles was recorded on SR 64 between U.S. 180 and Valle at Grand Canyon Airport Road (milepost 213.87). No other AADT traffic data were identified within the analysis area. No transportation studies are available on the network of unpaved roads identified within the analysis area.

3.10.2 ENVIRONMENTAL CONSEQUENCES

3.10.2.1 Proposed Action

During construction, the proposed action would result in a minor, short-term increase in traffic on U.S. 180 and SR 64 in the immediate vicinity of the project area. The work force and materials are expected to be drawn from the surrounding communities, northern Arizona, and the Phoenix metropolitan area and may utilize U.S. 180 and SR 64. Delays may occur during delivery of large equipment, such as the transformer and substation components; however, deliveries would be directed to the laydown area within the project area to minimize traffic delays. There may be minor traffic delays (up to 24 hours) during fiber-optic line installation when crossing these routes. The fiber-optic line may be constructed via horizontal directional drilling or aerial installation to minimize ground and traffic disturbance. Construction delays are not expected to impede existing uses of Forest Service roads and roads on private land and ASLD lands.

During construction, equipment, materials, and worker transportation for access to the substation, switchyard, microwave tower, line tap facilities, and underground electrical collection lines would increase the AADT on U.S. 180 and SR 64 by 5.8 percent and up to 1.3 percent, respectively, over existing traffic counts. During construction of the fiber-optic line, equipment, materials, and worker transportation would increase the AADT for U.S. 180 and SR 64 by less than 1 percent.

Construction would generate approximately 59 vehicle trips per day over a 12-month period. For the fiber-optic line alone, construction traffic would only generate up to five vehicle trips per day over a 5-month period on these roads. While the minor increase in construction traffic would not be noticeable along U.S. 180 and SR 64, the additional construction traffic could result in adverse, direct, temporary access delays to travel in the immediate vicinity of the project area at approximately milepost 255 along U.S. 180 and at approximately milepost 199 along SR 64.

Operation of the Project is not expected to cause or create any changes in traffic patterns. Traffic is likely to return to levels described above in the affected environment section, as construction workers would not travel to the site during Project operation. Decommissioning would have similar traffic impacts in the analysis area as described above.

3.10.2.2 No Action Alternative

Under the no action alternative, work force and materials would be expected to be drawn from the surrounding communities, northern Arizona, and the Phoenix metropolitan area and may use U.S. 180 and SR 64. Direct adverse impacts on transportation would be minor and short term under the no action alternative and would primarily result from construction vehicle trips associated with the BREC access road. Construction of the BREC access road turnoff at U.S. 180 may result in temporary traffic delays along U.S. 180. The Proponent would also be required to coordinate with ADOT to obtain necessary encroachment permits and implement traffic management measures to minimize impacts. Operations-related traffic would not increase traffic in the analysis area described above in the affected environment section. Decommissioning would have similar traffic impacts as under the proposed action.

3.11 AESTHETICS AND SCENERY RESOURCES

3.11.1 AFFECTED ENVIRONMENT

Scenery resources are the visible physical features of a landscape including landforms, vegetation patterns, water, wildlife, structures, and other features. Combined, these physical feature values create an image and make the landscape identifiable and unique, creating landscape character, which provides a baseline for scenery management and assessing a landscape's scenic integrity.

The analysis area for scenery resources is a 3-mile buffer from the project area. Project components that include the microwave tower, substation, APS line tap facilities, and interconnection access road either are on private land or land managed by the ASLD adjacent to the BREC. These Project components would be built next to the BREC, which would consist of large-scale solar and wind energy infrastructure. The aerial APS fiber-optic line is located in the western section of the Forest Service Williams Ranger District on Forest Service–managed land and privately managed land.

The project area is within the Arizona Mountains: Conifer Woodlands and Savannas IV ecoregion (EPA 2022). This area consists of flat, high desert pinyon-juniper savanna. Soil colors include light khaki to rust red soils with vegetation colors ranging from light tans to deep greens. Dispersed single-family homes can be found within the greater area but do not occur near the Project adjacent

to the BREC. However, there are approximately 18 residences located within 0.5 mile of the APS fiber-optic line located near the Cedar Mountain Substation. Elevation increases to the east and southeast of the analysis area.

The APS fiber-optic line would be built within a 300-foot NSTS ROW already occupied by two 500-kV transmission lines. The fiber-optic line would be no more than 100 feet north of the existing transmission lines, within the existing 300-foot NSTS ROW.

The APS fiber-optic line crosses two main throughfares, SR 64 and U.S. 180, leading to the southern rim of the Grand Canyon National Park. During the summer months, these highways are the main arteries for Grand Canyon National Park and receive tourism-related traffic from Flagstaff, Arizona and the Interstate 40 corridor. The analysis area consists of an undulating, clumped, pinyon-juniper savanna in a semi-arid high desert. To the southeast, the San Francisco Peaks and other mountains and hills can be easily seen.

Portions of the fiber-optic line occur on Forest Service–managed land which allows for recreation opportunities. The land is connected through a network of maintained roads, unimproved two-track roads, and dispersed camping sites. It is common within this area to find hunters, four-wheel-drive recreationalists, and off-highway vehicle (OHV) riders. A portion of the Great Western Trail, a multiple use route that traverses over 4,000 miles from Mexico to Canada, uses open Forest Service roads adjacent to and within the project area. Additionally, the Beale Wagon Road Historic Trail is located approximately 2.5 miles southeast from the southern section of the fiber-optic line (refer to Section 3.6, Cultural Resources). The Kaibab NF maintains and preserves a 23-mile section of this historic trail for visitors to enjoy (Forest Service 2013b).

3.11.1.1 Methodology

The Forest Service uses the Scenery Management System to systematically determine the relative value of scenery on NFS lands (Forest Service 1995). The process involves identifying scenic components as they relate to people, mapping the components, and assigning a value for aesthetics. The values assigned to NFS lands for scenery management are the Scenic Integrity Objectives (SIOs), which are used to assist the Forest Service in decision making relative to scenery resources. SIOs are objectives for maintaining the scenic integrity of the forest landscape and identify the maximum level of deviation allowed to the described landscape character. In combination with Forest Plan goals and objectives, they are used for Forest Plan monitoring and project planning (Forest Service 2014a). Below are the SIO definitions:

- Very high (unaltered): Characteristic landscape is intact, with only minute deviations.
- High (appears unaltered): Characteristic landscape appears intact. Deviations may be present, but should repeat form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident.
- Moderate (slightly altered): Landscape appears slightly altered. Noticeable deviations are visually subordinate to the landscape character.

- Low (moderately altered): Landscape appears moderately altered. Deviations may be dominant but are shaped to borrow from the natural landform and other visual dominance elements (line, form, texture, color), and are subordinate to the characteristic landscape when viewed as a background.

The SIOs for the scenery analysis area are defined in the Final Environmental Impact Statement for the Kaibab National Forest (Forest Service 2014b). The SIOs where the APS fiber-optic line crossed lands managed by the Forest Service are within the Moderate designation where the landscape appears slightly altered and High designation where only minimal alterations from landscape character are evident.

For Project components that are not on land managed by the Forest Service, components are analyzed by existing landscape character.

3.11.2 ENVIRONMENTAL CONSEQUENCES

3.11.2.1 Proposed Action

The primary purpose of the impact assessment was to evaluate and characterize the level of visual modification to the landscape that could result from the construction and operations and decommissioning of the Project. Impacts associated with the Project could occur if scenic quality is degraded or views from sensitive viewpoints are adversely modified. This section of the report describes the impact assessment and results of the visual resources study.

Units of measure for Impact Significance (Indicators): Scenery Resources

- Potential change to existing scenery experiences, setting, and deviations to landscape character.

Implementation of Project components would result in construction and operations and maintenance impacts on scenery resources. Short-term adverse impacts include the presence of construction vehicles and equipment, stringing of conductors, assembly and erection of transmission line structures, clearing and grading of facility foundations, and installation of fiber-optic line poles. Operations and maintenance of the Project would cause long-term adverse visual impacts. Project components would add new visual elements to the existing landscape that include new horizontal, vertical, and repeating features to the area. Larger Project components such as the substation, switchyard, and APS line tap facilities would add new colors, textures, and form to the existing landscape character. It is anticipated that the fiber-optic line, microwave tower, substation, APS line tap facilities, and facility access roads would be constructed concurrently or after the erection of the BREC. The expected future development of the BREC would allow components of the BREC Interconnection Project to absorb into the landscape character (see Cumulative Effects Section 4.1.7, Aesthetics and Scenery Resources).

The construction of the microwave tower, substation, switchyard, and APS line tap facilities located adjacent to the BREC generation facility could potentially impact dispersed recreationalists accessing Forest Service land. These Project components are on lands that are not managed by the Forest

Service and do not have any visual management goals but would still incur adverse short- and long-term scenery impacts. Residences located near the Cedar Mountain Substation could be affected by the installation of the APS fiber-optic line, but due to existing topography, vegetation, and transmission lines, the visual contrast would be minimal.

The APS fiber-optic line spanning from the Cedar Mountain Substation to the BREC substation may affect views from SR 64 and U.S. 180. Construction of the fiber-optic line would require approximately eight to 10 wooden poles per mile and would generally not exceed 65 feet in height. The poles adjacent to the highway crossings at SR 64 and U.S. 180 would be up to 100 feet in height with guyed wires; these poles would fall within the NSTS ROW. The fiber poles would be built within the existing 500-kV 300-foot NSTS ROW no farther than 100 feet from the existing infrastructure. The construction and addition of repeating horizonal and linear features would add a new element to the existing landscape setting. However, the placement of the fiber-optic line in the existing ROW and the use of wooden poles, borrowing attributes from the valued landscape character, would allow this new element to mostly blend into the existing scenery. To the casual observer, the proposed fiber-optic line would not change the existing view of the NSTS ROW. It is anticipated that the fiber-optic line could be seen from SR 64 and U.S. 180 at a distance of 0.25 mile, but Project elements would be absorbed into the existing transmission corridor.

Project components would be constructed to Forest Service standards using general guidelines for scenery management. The proposed action would be compatible with the SIO designation as Project components would be similar to existing infrastructure (i.e., the extra-high voltage ROW) in the area. Overall impacts on scenery resources that intersect with Forest Service land are expected to be direct, adverse, and long term but negligible. Impacts on scenery resources that occur on private and ASLD lands are also expected to be long term and minimal, as described above.

Impacts associated with decommissioning would be of a nature and duration similar to short-term impacts associated with construction activities. The primary visual impacts from decommissioning would be the deconstruction of the substation, APS line tap facility, and APS fiber-optic line with the addition of on-site traffic, and dozens of construction workers. Once Project components have been removed from the site, the landscape character would revert to a pre-construction state once revegetation is established, where more natural landscape features would be present.

3.11.2.2 No Action alternative

Under the no action alternative, the BREC access road would be constructed in the project area.Figure 4 The BREC access road constructed parallel to the NSTS ROW would repeat visual elements of the existing NSTS ROW access road. Short-term impacts would be similar to the proposed action and include construction vehicles, staged equipment, and the clearing and grading of soil. During construction, BMPs would be implemented to conserve or minimize effects on aesthetics as implemented for the proposed action. Long-term impacts would include operations and maintenance of Project components, similar to those described under the proposed action for the interconnection components. Under the no action alternative, impacts to aesthetics from decommissioning would be similar to the proposed action.

3.12 WATER RESOURCES

3.12.1 AFFECTED ENVIRONMENT

The effects analysis area for water resources is the project area. This encompasses the areas where ground disturbance resulting in effects on water resources is proposed. An Aquatic Resources Assessment Report was prepared for the Project, which includes the methodology, evaluation, and effects determination for water resources identified in the project area. The results of this analysis are summarized below (SWCA 2022a).

3.12.1.1 Watersheds

The project area is within nine Hydrologic Unit Code (HUC)-12 watersheds as indicated in Table 13 and shown on Figure 7 (U.S. Geological Survey [USGS] 2022). The Forest Service portion of the fiber-optic corridor is located within five of the nine watersheds: Big Hole Tank, Miller Wash Headwaters, Rio Tank, North Tank, and Middle Spring Valley Wash. The other Project components, such as the fiber-optic line, underground electrical collection lines, substation, switchyard, and APS line tap sites, are located downstream of Forest Service land in the remaining four watersheds.

Table 13. Project Area Watersheds

Watershed Name	Hydrologic Unit Code (HUC-12)	Area (acres)
Rabbit Canyon	150200160603	41,367
Dent and Sayer Tank	150200160601	37,240
Big Hole Tank	150100040402	22,001
Miller Wash Headwaters	150100040403	31,239
Rio Tank	150100040204	22,581
North Tank	150100040202	19,857
Middle Spring Valley Wash	150100040203	32,691
Smoot Lake	150100040505	21,546
Lower Red Lake Wash	150100040508	32,724
Total		**261,246**

According to the Forest Service National Watershed Condition Class and Prioritization Information website, four of the watersheds (Big Hole Tank, North Tank, Middle Spring Valley Wash, and Lower Red Lake Wash) are Functioning Properly and the remaining five watersheds are Functioning at Risk (Forest Service 2022a). The definition provided by the Forest Service Watershed Condition Classification Technical Guide (the Guide) for watersheds functioning properly is "Class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition"; and for watersheds functioning at risk is "Class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition" (Forest Service 2011).

The Guide also describes the Forest Service Watershed Condition Classification system that uses 12 indicators related to watershed processes to assess and track watershed functions and values that affect soil and hydrologic function. For the nine watersheds in which this Project is located, these 12 indicators and their condition ratings are provided in Appendix A, Table A.5.

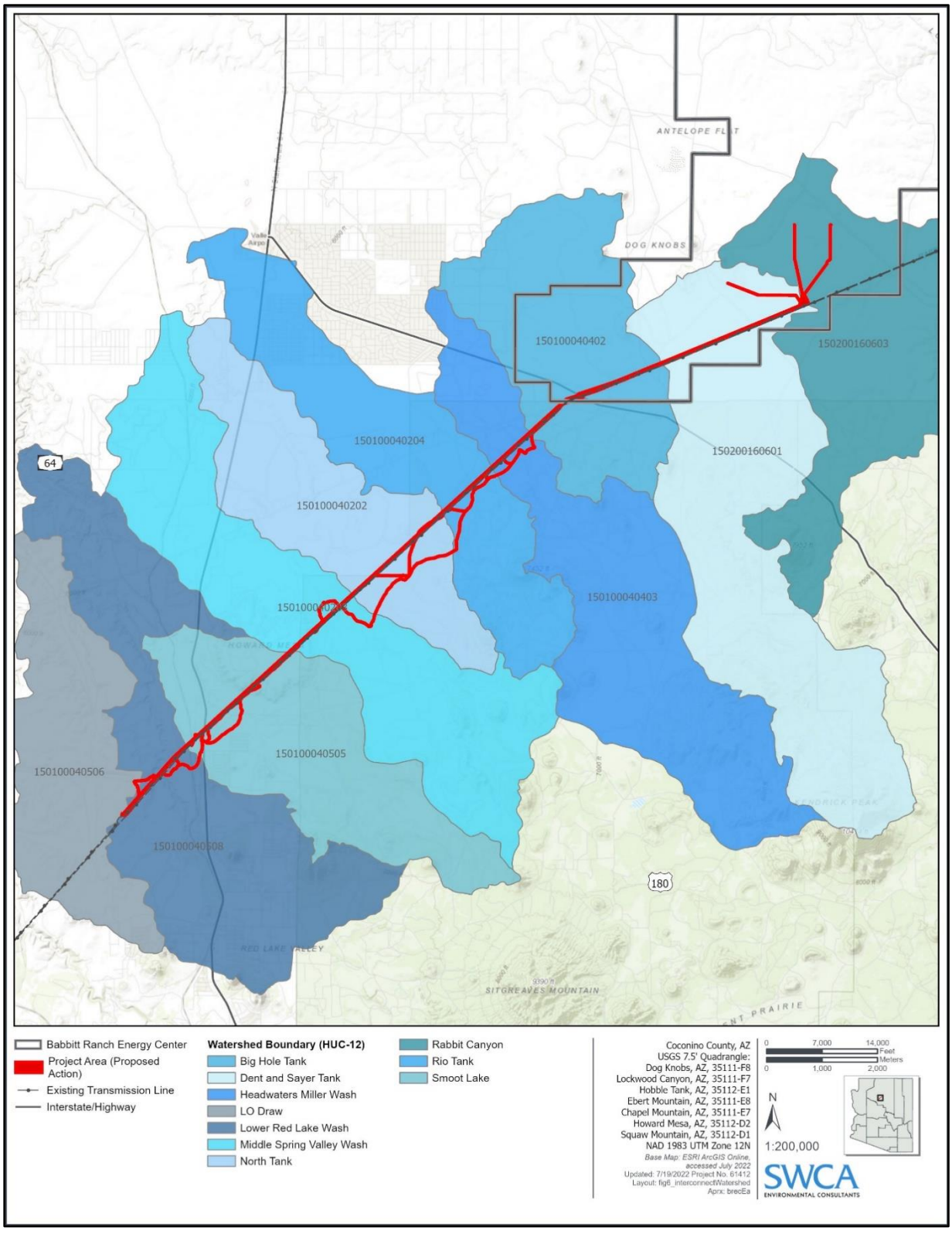

Figure 7. Watersheds in the project area.

3.12.1.2 Potential Clean Water Act Jurisdictional Surface Water Features including Wetlands

Review of the USGS National Hydrography Dataset (NHD) and U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) datasets and aerial imagery indicate that 28 ephemeral surface water features intersect with the linear components associated with the Project, four of which are crossed twice, one is crossed three times, with the remaining features each crossed once. The NHD and NWI features are characterized as streams and classified as Cowardin Class R4SBC (Cowardin et al. 1979; USFWS 2022c). The Cowardin class code translation for R4SBC is riverine, intermittent, streambed, seasonally flooded and this classification is generally associated with ephemeral streams (i.e., drainages or washes) in the Arid West and Western Mountains Regions. The NHD indicated 25 flowlines cross the project area. Eighteen of these 25 flowlines within the project area are associated with NWI features. Five additional surface features were identified in the project area not appearing in the NHD or NWI data using aerial imagery. During the desktop review, no surface water features were identified for the locations of the substation, switchyard, line tap, and microwave tower site. The fiber-optic and underground electrical collection lines and access roads were found to intersect the 28 ephemeral surface water features at 34 crossings. No perennial or intermittent streams, riparian or xero-riparian habitats, or potential wetland resources were identified in the project area during the desktop review. There are no listed Outstanding Waters of Arizona or impaired waters in the project area or within 0.25 mile downstream of the Project in any of the 28 surface water features identified during desktop review.

The 28 surface water features identified during the desktop review were subject to field verification at the 34 Project component crossings during Clean Water Act (CWA) jurisdictional delineation fieldwork conducted on March 24–25 and May 12–13, 2022. One surface water feature, Red Lake Wash located near the western end of the fiber-optic corridor, was found to be potentially jurisdictional, as it exhibited clear indicators of ordinary high-water mark (OHWM) flows (Figure 8). The remaining 27 features present in the project area were not found to exhibit clear OHWM indicators and were subsequently determined to be non-jurisdictional erosional features or swales. These 27 ephemeral features may transport stormwater flows from localized precipitation events; however, it is unlikely that they would be considered waters of the U.S. (WOTUS) and subject to federal CWA regulation or its Section 404 permitting requirements. No perennial or intermittent streams, riparian or xero-riparian habitats, or potential wetland resources were identified in the project area during field reconnaissance.

3.12.2 ENVIRONMENTAL CONSEQUENCES

3.12.2.1 Proposed Action

Watersheds

Table A.6 in Appendix A discusses the construction and operations of the Project's potential to impact the 12 watershed condition indicators of the nine watersheds in which the Project occurs. The Project's impacts on watershed condition indicators would be similar across all nine watersheds. The Project would not impact the watershed condition indicators of water quantity, aquatic biota,

riparian and wetland vegetation, fire regime or wildfire, and forest health. With the implementation of BMPs and control measures for water and soil resources described in Table 7 and the Project's Stormwater Pollution Prevention Plan (SWPPP), potential direct and indirect adverse impacts to the watershed condition indicators of water quality, aquatic habitat, roads and trails, soils, forest cover, rangeland vegetation, and terrestrial invasive species would be minimized or avoided; therefore, existing watershed conditions would be unchanged by the proposed action.

Potentially Jurisdictional Surface Water Features

The drainage features in the project area, of which several were influenced by livestock activity, show poor development of bed and banks, have discontinuous OHWMs, and in most cases can be described as non-jurisdictional small erosional features or swales.

The proposed action would have no impacts on WOTUS or potential non-WOTUS features because Red Lake Wash and the other non-WOTUS features would be spanned and avoided during construction of the BREC interconnection components and the aerial fiber-optic installation. In addition, control measures described in the Project's SWPPP to minimize or avoid potential impacts from sediment transport would also serve to minimize or avoid direct and indirect impacts to WOTUS and potential non-WOTUS features during Project construction.

Impacts to water resources resulting from Project decommissioning would be similar to those occurring during construction and operations. It is anticipated that underground components such as the collector lines would be abandoned in place and no ground disturbance would occur; however, removal of the switchyard and line tap equipment and utility poles of the fiber-optic line would involve ground disturbance within the same footprint as original construction with similar impacts to water resources, mostly from the risk of sediment transport.

3.12.2.2 No Action alternative

As discussed in Section 2.2, the BREC access road would still be constructed in the project area under the no action alternative. There are several non-WOTUS features crossed by the BREC access road. As with the proposed action, adverse direct and indirect impacts to non-WOTUS surface water resources could be minimized or avoided with the same BMPs that would be implemented in the proposed action. Under the no action alternative, impacts to water resources from decommissioning would be similar to the proposed action. Therefore, impacts to water resources from the no action alternative would be similar to those under the proposed action.

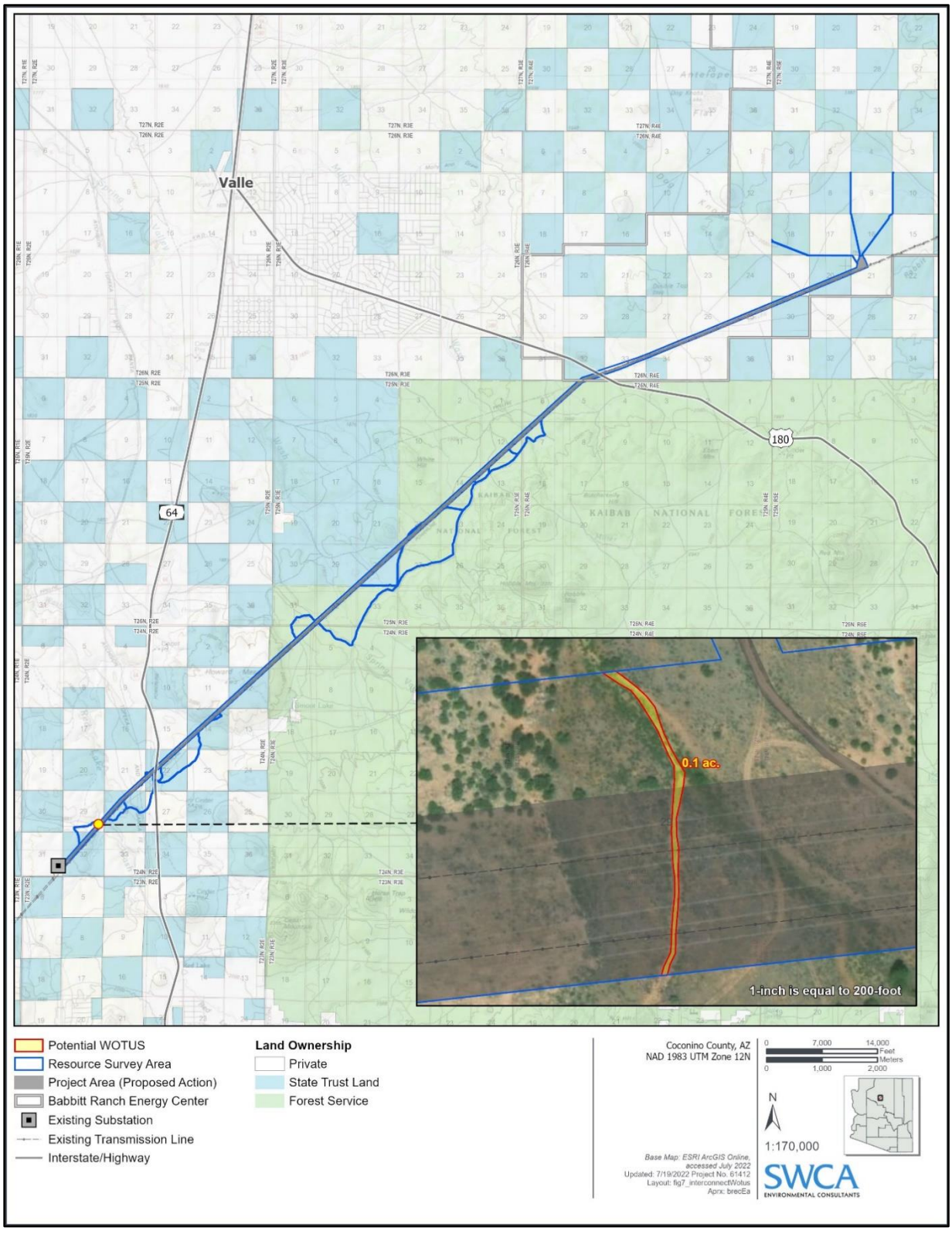

Figure 8. Red Lake Wash (Feature 24) preliminary jurisdictional delineation.

4.0 Cumulative Effects

A cumulative effect is defined under NEPA as:

> "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR Part 1508.1(g)(3)).

Past, present, and reasonably foreseeable future actions that incrementally add to the potential cumulative impacts of the BREC Interconnection Project and the no action alternatives are considered in this EA. The intent of this analysis is to capture the total effects of several actions over time that would be missed by evaluating each action individually.

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

The spatial context being considered for cumulative effects differs by resource, as explained in the resource topic cumulative effects sections below. For each resource topic, the cumulative effects analysis area (CEAA) is the same as the analysis area for direct and indirect environmental effects, unless noted otherwise. The analysis temporal scale is approximately 42 years to account for the pre-construction period, construction period (12 months for the BREC Interconnection Project and 5 months for the fiber-optic cable), operational life of the BREC Interconnection Project (40 years), and decommissioning after the 40-year life of the Project. Table 14 lists the past, present, and reasonably foreseeable future actions analyzed for cumulative impacts for resources presented in Chapter 3.

Table 14. Past, Present, and Reasonably Foreseeable Future Projects

Project Name	Description	Status/Schedule	Project Location
Utility and access road rights-of-ways	ROWs have been previously established, and disturbance associated with those ROWs has occurred in the past, such as weed management and habitat fragmentation.	Ongoing.	Project area and surrounding vicinity
Existing paved highways	SR 64 and U.S. 180 are existing paved highways, and disturbance associated with these ROWs has occurred in the past, such as weed management and habitat fragmentation.	1931–1964.	Project area and surrounding vicinity

Project Name	Description	Status/Schedule	Project Location
Perrin Ranch Wind Energy Interconnection Project	The Perrin Ranch Wind Energy Interconnection Project interconnected the Perrin Ranch Wind Energy Center to the Moenkopi-Yavapai transmission line via new APS substation (the Cedar Mountain Substation). The Western Area Power Administration and Reclamation completed an EA and Finding of No Significant Impact for the interconnection project in 2011.	The Perrin Ranch Wind Energy Interconnection Project was constructed in 2011/2012.	Overlaps project area where the fiber-optic line corridor emanates from the Cedar Mountain Substation
Babbitt Ranch Energy Center (BREC)	The BREC is a 161-MW renewable energy project that consists of a proposed 160-MW wind energy facility, a 60-MW photovoltaic solar energy facility, and up to 60 MW of energy (battery) storage located on private and ASLD lands. The BREC includes a 9-mile power line feed from Valle to the BREC. The BREC also includes a 7.25-mile access road from U.S. 180 to the BREC project area. The BREC has a 40-year operational life (SWCA 2022b).	The BREC construction is scheduled to commence at the end of 2022 with the BREC access road. The target completion date for the BREC is December 2023.	BREC overlaps with the project area north of U.S. 180 and extends approximately 5 miles north and west of the proposed interconnect area
CO Bar Solar Complex (CO Bar Solar)	The CO Bar Solar is a 400-MW solar project on approximately 2,400 acres of private lands northwest of Flagstaff in Coconino County. CO Bar Solar has a 35-year operational life (*Flagstaff Business News* 2021).	CO Bar Solar has an 18-month construction timeline expected to begin in 2023 and a target operation date of 2024.	CO Bar Solar overlaps with the project area north of U.S.180 and extends in all directions within approximately 3 to 5 miles of the proposed interconnect area
Private land grazing	Livestock grazing occurs on private lands.	Grazing occurred in the past. Grazing is currently occurring and expected to continue to occur for the foreseeable future.	Overlaps project area where Project components occur on private lands, including fiber-optic corridor and access roads

Project Name	Description	Status/Schedule	Project Location
Forest Service Grazing Allotments	Livestock grazing occurs on the Ebert and Smoot Lake grazing allotments on the Kaibab NF.	Grazing occurred in the past. Grazing is currently occurring and expected to continue to occur for the foreseeable future.	Overlaps project area where Project components occur on Forest Service–managed lands, including fiber-optic corridor and access roads
State Grazing Allotments	Livestock grazing allotments issued by the State on ASLD lands.	Grazing occurred in the past. Grazing is currently occurring and expected to continue to occur for the foreseeable future.	Overlaps project area where Project components occur on ASLD lands, including fiber-optic corridor, access roads, and collection lines
Grassland restoration activities (Joint Chief's Landscape Restoration and South Zone Grassland Restoration Project)	Grassland restoration, primarily by cutting juniper trees and prescribed burning, is occurring on Kaibab NF, ASLD, and private lands in and around the project area.	Activities have occurred the past, are currently occurring, and are expected to continue to occur for the foreseeable future. A Joint Chiefs' Landscape Restoration Project award is expected to increase the pace of treatment beginning in FY22 through at least FY24.	The greater restoration area overlaps the project area; however, the closest planned activity is approximately 2.3 miles from project area
North Forest Grassland Restoration Project	Coconino NF project to reduce pinyon and juniper encroachment on grasslands within the northern boundaries of Coconino NF. Treatments would focus on thinning the encroaching trees followed by broadcast burns over the next 30 to 40 years (Forest Service 2019).	Decision memo signed September 19, 2019. Implementation of next 30 to 40 years.	2.4 miles from project area
Timber Harvest	Past timber harvests have occurred in the project area and vicinity. Disturbances associated with these activities, including soil compaction and habitat fragmentation, have occurred in the past.	Activities have occurred in the past over several decades of timber management.	Project area and vicinity

Project Name	Description	Status/Schedule	Project Location
Flagstaff and Williams Ranger District (Coconino and Kaibab NFs) Christmas Tree Sales	The Districts sells permits for Christmas tree cuttings for those with a valid permit in permitted areas.	Ongoing and likely to continue.	Overlaps Project components located on Forest Service–managed lands
CommNet Grand Canyon Unified School District fiber-optic line	Installation of approximately 54 miles of aboveground and buried fiber line; approximately 19 miles is on Kaibab NF lands and the remainder is on ASLD and private lands. Primarily follows SR 64 corridor between Williams and Tusayan (Forest Service 2022d).	Installation nearly complete.	Intersects project area along fiber-optic corridor and access roads
Four Forest Restoration Initiative Projects	Four National Forests—the Kaibab, Coconino, Apache-Sitgreaves and Tonto—are collaborating in landscape-scale initiative designed to restore fire-adapted ecosystems with goals to restore the structure, pattern, composition, and health of fire-adapted ponderosa pine ecosystems, reduce fuels and the risk of unnaturally severe wildfires, and provide for wildlife and plant diversity. Projects include mechanical thinning and prescribed burns across 2.4 million acres within these NF. For the Fiscal Year 2022, the Forest Service would commit $54 million to implement high-priority projects on 135,000 acres over the next 10 years (Forest Service 2021).	Funding has been approved for high-priority projects over the next 10 years.	2.4 miles from project area

The cumulative effects of past actions contributed to and are accounted for in the baseline conditions of the affected environment for each resource in Chapter 3. For this analysis, "reasonably foreseeable" actions are considered where there is a proposed action or existing decision (e.g., draft NEPA document, record of decision, or issued permit), a commitment of resources or funding, or a formal proposal (e.g., a permit request). Actions that are highly probable based on known opportunities or trends (e.g., residential development in urban areas) are also considered. Speculative future developments (such as those that are not formally proposed or do not have sufficient project details to inform analysis) are not considered. SWCA conducted a desktop review of potential present and future actions in the defined CEAA. Resources examined include local news sources, Forest Service data available in the Schedule of Proposed Action (SOPA) for

Coconino NF (Forest Service 2022b) and Kaibab NF (Forest Service 2022c), and Coconino County information. Figure 9 shows the reasonably foreseeable projects within CEAAs.

The cumulative effects analysis includes actions that meet the following criteria:

- The action impacts a resource potentially affected by the proposed action.
- The action causes impacts within all or parts of the same geographic scope of the proposed action.
- The action causes impacts within all or part of the temporal scope for the potential impacts from the proposed action.

The proposed action is not expected to have significant impacts to biological resources, cultural resources, land use, noise, soils, transportation, aesthetic and scenery resources, and water resources, including wetlands. Impacts to the resources analyzed in Chapter 3 would mostly be localized to the project area, with most of the impacts occurring during the approximate 12-month-long Project construction period. Apart from BREC, CO Bar Solar, grazing allotments, Christmas tree sales, and CommNet Grand Canyon Unified School District fiber-optic line, the projects identified above do not directly overlap the project area, but they may contribute to indirect cumulative impacts that extend beyond the Project boundary. The impacts of projects that comprise the cumulative scenario combined with the proposed action could contribute to cumulative effects on certain resources, as discussed below.

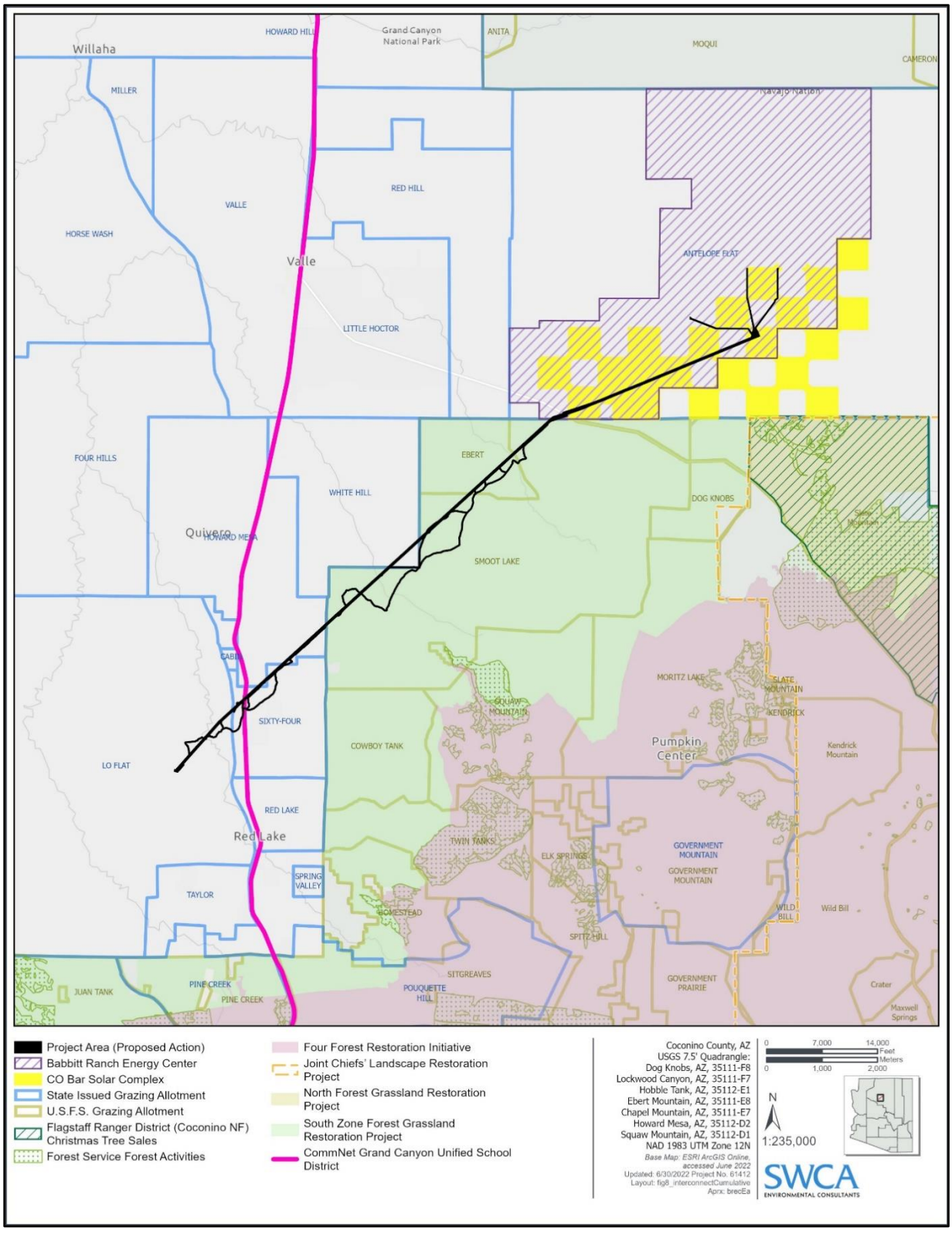

Figure 9. Reasonably foreseeable projects within the cumulative effects analysis areas.

4.1.1 BIOLOGICAL RESOURCES

The CEAA for biological resources is the project area plus a 3-mile buffer. This area was chosen to encompass where cumulative impacts from the proposed Project could occur to biological resources. The CEAA intersects with the project areas of the projects listed in Table 14.

4.1.1.1 Vegetation

There would be minor and localized impacts to vegetation resources, as discussed in Section 3.1, Vegetation. Cumulative actions that occur in the analysis area with the potential to contribute adverse vegetation impacts from the proposed action–related activities include projects listed above in Table 14. These projects were included because they partially overlap with portions of the CEAA. Other ongoing and reasonably foreseeable projects that could increase or decrease grassland vegetation abundance and thus habitat makeup within the analysis area include grassland restoration activities and the North Forest Grassland Restoration Project that would reduce juniper abundance and increase the abundance and quality of grassland habitats in the analysis area. The construction of the BREC would occur during the construction phase of the proposed action. Proposed action operations and maintenance, and decommissioning activities would occur at the same time as the BREC as well. The incremental cumulative impact from the proposed action, in addition to the other projects in the analysis area, is negligible and would result in minimal localized changes to the vegetation resources in the area.

4.1.1.2 General Wildlife

There would be negligible and localized impacts to general wildlife resources, as discussed in Section 3.2, General Wildlife. Cumulative actions that occur in the analysis area with the potential to contribute adverse general wildlife impacts from the proposed action–related activities include projects listed above in Table 14. These projects were included because they partially overlap with portions of the CEAA. The construction of the BREC would occur during the construction phase of the proposed action. Proposed action operations and maintenance, and decommissioning activities would occur at the same time as the BREC as well. The incremental cumulative impact from the proposed action, in addition to the other projects in the analysis area, is negligible and would result in minimal localized impacts to general wildlife in the area.

4.1.1.3 Migratory Birds

There would be negligible and localized impacts to migratory birds, as discussed in Section 3.3, Migratory Birds. Cumulative actions that occur in the CEAA with the potential to impact migratory birds in addition to proposed action–related activities include projects listed above in Table 14. These projects were included because they partially overlap with portions of the CEAA. The construction of the BREC would occur during the construction phase of the proposed action. Proposed action operations and maintenance, and decommissioning activities would occur at the same time as the BREC as well. The incremental cumulative impact from the proposed action, in addition to the other projects in the analysis area, is negligible and would result in minimal localized

effects on migratory birds as well as golden eagles in the area. As there would be no Project-related impacts to bald eagles, the proposed action would not contribute to cumulative impacts on this species.

4.1.1.4 Special-Status Species

Forest Service Sensitive Plant Species and Habitat

There would be negligible and localized impacts to Forest Service Sensitive plant species and habitat resources, as discussed in Section 3.4, Special-Status Species: Forest Service Sensitive Plant Species and Habitat. Cumulative actions that occur in the analysis area with the potential to contribute adverse Forest Service Sensitive plant species and habitat impacts from the proposed action–related activities include the projects listed above in Table 14. These projects were included because they partially overlap with portions of the CEAA. The construction of the BREC would occur during the construction phase of the proposed action. Proposed action operations and maintenance, and decommissioning activities would occur at the same time as the BREC as well. The incremental cumulative impact from the proposed action, in addition to the other projects in the analysis area, is negligible and would result in minimal localized impacts to the Forest Service Sensitive plant species and habitat resources in the area.

Forest Service Sensitive Wildlife

There would be negligible and localized impacts to Forest Service Sensitive wildlife resources, as discussed in Section 3.5, Special-Status Species: Forest Service Sensitive Wildlife. Cumulative actions that occur in the analysis area with the potential to contribute adverse Forest Service Sensitive wildlife impacts from the proposed action–related activities include projects listed above in Table 14. These projects were included because they partially overlap with portions of the CEAA. The construction of the BREC would occur during the construction phase of the proposed action. Proposed action operations and maintenance, and decommissioning activities would occur at the same time as the BREC as well. The incremental cumulative impact from the proposed action, in addition to the other projects in the analysis area, is negligible and would result in minimal localized effects on Forest Service Sensitive wildlife in the area.

4.1.2 CULTURAL RESOURCES

The cultural resources CEAA is a 3-mile buffer around the project area. The proposed action would not contribute to cumulative impacts to cultural resources because adverse impacts to historic properties would be avoided by the proposed action through the implementation of an agency-approved Monitoring and Discovery Plan for cultural sites, buffers around identified cultural resources, monitoring of ground-disturbing construction activities within 50 feet of a historic property, imported borrow material from approved ADOT sources, and cultural awareness training for construction workers.

4.1.3 LAND USE AND GRAZING

The CEAA for land use and grazing is the project area. Cumulative effects on land use could occur where lands are converted from one use to another (i.e., where undeveloped land is converted to utility infrastructure). Land use in the analysis area is predominantly undeveloped rangelands and existing utility ROW. The proposed action would result in minor temporary and permanent impacts to land use and grazing during construction, for the Project life (40 years), and during decommissioning, as described in Section 3.7, Land Use and Grazing. The BREC and CO Bar Solar Projects overlap with the project area and could result in minor temporary and permanent impacts to land use from changing undeveloped grazing lands to utility infrastructure, similar to those associated with the proposed action. Proposed action operations and maintenance, and decommissioning activities would occur at the same time as the BREC as well. None of the other projects identified in Section 4.1, Past, Present, and Reasonably Foreseeable Future Actions, overlap the analysis area.

4.1.4 NOISE

The CEAA for noise is a 0.5-mile buffer around the project area. As stated in Section 3.8, Noise, there are 18 sensitive noise receptors within the CEAA. The proposed action would have temporary, minor impacts to sensitive receptors, localized and lasting only during construction (see Section 3.8, Noise). Cumulative projects that occur in the analysis area would contribute adverse noise impacts from construction include the BREC and CO Bar Solar, which overlap with the proposed action and occur within the CEAA. Construction of the BREC and the proposed action would occur at the same time. The construction noise would be temporary and would contribute to higher existing ambient noise levels in the analysis area. Since the equipment to be used during construction is transient in nature, it is anticipated that construction noise would be less than the EPA's Ldn of 65 dBA at sensitive receptors. The noise generated would also occur only during daytime hours when residential land uses are less sensitive to noise intrusions. Thus, cumulative impacts to sensitive receptors from construction noise would be minor and short term. Operations and maintenance of the proposed action, BREC, and CO Bar Solar would generate low levels of periodic noise; however, the magnitude of that noise is not considered significant, and the noise would dissipate with increasing distance from the boundary of these projects. Therefore, those adverse impacts likely would be infrequent, of short duration, and minor.

4.1.5 SOILS

The analysis area for soils is the project area. Impacts to soils from the proposed action would result in localized, compaction, increased erosion potential, loss of soil productivity, and increased likelihood of establishment of noxious weeds, as discussed in Section 3.9, Soils. The proposed action would result in minor temporary impacts to soils and permanent impacts to soils during construction, for the duration of the Project life (40 years), and during decommissioning, as described in Section 3.9. The BREC, CO Bar Solar, grazing allotments (Forest Service and ASLD), and the CommNet Grand Canyon Unified School District fiber-optic line would overlap with the project area and would result in additional minor temporary and permanent impacts to soils from surface-disturbing activities during construction, similar to those described under the proposed

action. Proposed action operations and maintenance, and decommissioning activities would occur at the same time as the BREC as well. The proposed action, when combined with these projects, would cumulatively result in localized short and long-term increase in surface disturbance. However, these effects would be minimized through implementation of erosion minimization measures. The cumulative effect of the BREC, CO Bar Solar, and the proposed action would result in minor temporary and permanent cumulative impacts to soils.

4.1.6 TRANSPORTATION

The analysis area for transportation is a 5-mile buffer of the project area. Impacts to transportation would be temporary, lasting during construction, as discussed in Section 3.10, Transportation. Impacts to transportation from construction of the projects identified in Table 14 would primarily include increased traffic associated with construction workers and delivery of construction equipment and materials to the worksites. The cumulative effects on transportation from the proposed action and the projects listed in Table 14 would be short term, minor, and localized. The projects listed in Table 14 would be required to comply with all applicable roadway management standards and policies during construction; therefore, the potential cumulative effects are not expected to change the transportation trends in the analysis area.

4.1.7 AESTHETICS AND SCENERY RESOURCES

The scenery resources analysis area is a 3-mile buffer surrounding the project area. Impacts to scenery resources from the proposed action would range from negligible to minimal, as discussed in Section 3.11, Aesthetics and Scenery Resources. Any project that would result in modification of the landscape, such as new energy development, could contribute to the cumulative adverse impacts to landscape character and scenery resources. These developments, when added to the direct effects of the proposed Project, could incrementally convert the scenic quality of the natural landscapes into a more developed landscape that would adversely affect scenery and sensitive viewers over time. Construction of the BREC and the CO Bar Solar Projects would considerably change the landscape character of the analysis area through the long-term presence of wind and solar facilities in the analysis area. The CO Bar Solar Project would impact scenic resources; however, because the solar arrays are away from roads and sensitive viewing locations, it is unlikely that construction of this project would overall contribute cumulatively to impacts on analysis area landscape character. The cumulative effect of the BREC wind turbine operations would adversely impact the current landscape character and sensitive viewing locations in the analysis area, including U.S. 180 and the Arizona National Scenic Trail. This impact includes increased contrast and movement in the landscape from wind turbine operation, although turbines have applied setbacks from these areas larger than required. The cumulative impact from the BREC Interconnection Project, in addition to the other projects in the analysis area, is minimal and would result in negligible changes to the area's landscape character.

4.1.8 WATER RESOURCES

The USACE jurisdictional waters, including wetlands analysis area is the project area. The proposed action would have no direct or indirect impacts on watershed conditions and either no or negligible

temporary direct or indirect impacts on surface water features. Therefore, no cumulative water resource impacts would occur.

5.0 Consultation and Coordination

5.1 PERMITS TO BE ACQUIRED

Babbitt Ranch Energy Center, LLC, and/or APS would prepare a Stormwater Pollution Prevention Plan and submit a notice of intent to the Arizona Department of Environmental Quality to obtain coverage under the Arizona Pollution Discharge Elimination System Construction General Permit prior to construction.

The Project would intersect and cross SR 64 and U.S. 180, two roads which fall under the jurisdiction of the ADOT Northcentral District. Installation of the fiber-optic line within these road ROWs would require an encroachment permit, which would be secured by Babbitt Ranch Energy Center, LLC, and/or APS prior to commencement of construction.

Pursuant to Section 106 of the NHPA (54 USC 306108), which requires federal agencies to consider the effects of their actions on historic properties, a cultural resources inventory was conducted for the proposed Project, which constitutes a federal undertaking. In compliance with Section 106 of the NHPA, Reclamation will consult on NRHP-eligibility and effect with the Arizona SHPO, interested Native American tribes, Kaibab NF, ASLD, and APS.

APS would secure a FS SUP from the Kaibab NF prior to the installation and maintenance of the portion of fiber-optic line that falls within NFS lands. The SUP would authorize APS the legal use and access across NFS lands for the Cedar Mountain Substation to BREC Interconnection Project fiber-optic corridor. The Kaibab NF would consider this request in accordance with 36 CFR Part 251, Subpart B.

5.2 LIST OF PREPARERS

Table 15. List of Preparers

Name	Position / Role
Reclamation Team	
Kelly Bergin	Environmental Protection Specialist/NEPA Team Project Manager
Carol Evans	Wildlife Biologist
Sean Heath	Division Manager Supervisory Environmental Specialist
Lauren Jelinek	Archaeologist
Jorge Mora-Lopez	Mechanical Engineer
Forest Service Team	
Clairisse Loucks	NEPA Specialist

Name	Position / Role
Charles Webber	Archaeologist
Marcos Roybal	Environmental Coordinator/Interdisciplinary Team Lead
Jeremy Haines	Public Services Staff Officer
Chelsea Muise	Recreation, Lands, & Minerals Program Manager
Noni Lyndon	Tribal Relations
Travis Largent	Wildlife Biologist
Justin Schofer	Wildlife Biologist
Robert Ballard	Soils and Watershed Program Manager
Jesse Duff-Woodruff	Botanist
Debra Mollet	District Ranger

5.3 AGENCY COORDINATION AND TRIBAL CONSULTATION

5.3.1 TRIBAL CONSULTATION

Table 16. List of Tribal Nations Consulted

Name	Date and Type of Communication	Outcome
Fort Mojave Indian Tribe	June 8, 2022 – Scoping letter sent	Ongoing.
Havasupai Tribe	June 8, 2022 – Scoping letter sent	Ongoing.
Hopi Tribe	June 8, 2022 – Scoping letter sent	Ongoing.
Hualapai Tribe	June 8, 2022 – Scoping letter sent	Ongoing.
Kaibab Band of Paiute Indians	June 8, 2022 – Scoping letter sent	Ongoing.
Mescalero Apache	June 8, 2022 – Scoping letter sent	Ongoing.
Navajo Nation	June 8, 2022 – Scoping letter sent	Ongoing.
Pueblo of Zuni	June 8, 2022 – Scoping letter sent	Ongoing.
San Carlos Apache Tribe	June 8, 2022 – Scoping letter sent	Ongoing.
Yavapai Apache Nation	June 8, 2022 – Scoping letter sent	Ongoing.
Yavapai-Prescott Indian Tribe	June 8, 2022 – Scoping letter sent	Ongoing.

5.3.2 LIST OF AGENCIES CONSULTED

Table 17. List of Agencies Consulted

Name	Date and Type of Communication	Outcome
Arizona Public Service	June 8, 2022 – Scoping letter sent	No response.
Arizona Department of Environmental Quality	June 8, 2022 – Scoping letter sent	No response.

Name	Date and Type of Communication	Outcome
Arizona Department of Transportation	June 8, 2022 – Scoping letter sent	Provided scoping comments in a letter dated July 7, 2022. See Section 1.6, Public Involvement and Agency Consultation, for further details.
Arizona Game and Fish Department	June 8, 2022 – Scoping letter sent	Provided scoping comments in a letter dated July 8, 2022. See Section 1.6, Public Involvement and Agency Consultation, for further details.
Arizona State Land Department	June 8, 2022 – Scoping letter sent	No response.
Bureau of Indian Affairs	June 8, 2022 – Scoping letter sent	No response.
Bureau of Land Management	June 8, 2022 – Scoping letter sent	No response.
Natural Resources Conservation Service	June 8, 2022 – Scoping letter sent	No response.
Coconino County Department of Environmental Quality	June 8, 2022 – Scoping letter sent	No response.
Coconino County Flood Control District	June 8, 2022 – Scoping letter sent	No response.
U.S. Army Corps of Engineers	June 8, 2022 – Scoping letter sent	No response.
U.S. Environmental Protection Agency	June 8, 2022 – Scoping letter sent	Provided scoping comments in a letter dated July 1, 2022. See Section 1.6, Public Involvement and Agency Consultation, for further details.
U.S. Federal Highway Administration	June 8, 2022 – Scoping letter sent	No response.
U.S. Fish and Wildlife Service	June 8, 2022 – Scoping letter sent	No response.
U.S. Geological Survey	June 8, 2022 – Scoping letter sent	No response.

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Appendix A. Supplemental Resource Analysis Tables

Table A.1. Cultural Resources Identified within the Project Area

Site Number	Site Description	Land Jurisdiction	Eligibility/Criteria	Project Component
AR-03-07-02-0002	Archaic Cohonina artifact scatter with rock features	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line corridor
AR-03-07-02-1518	Cohonina habitation	Kaibab NF	Unevaluated	Fiber-optic line corridor
AR-03-07-02-1981	Cohonina habitation	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line access road corridor
AR-03-07-02-1994	Archaic Cohonina artifact scatter	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line corridor
AR-03-07-02-1996	Cohonina artifact scatter	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line corridor
AR-03-07-02-1999	Cohonina artifact scatter	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line
AR-03-07-02-2002	Cohonina artifact scatter	Kaibab NF	Indeterminate eligibility	Fiber-optic line corridor
AR-03-07-02-2014	Cohonina artifact scatter	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line access road corridor
AR-03-07-02-2339	Cohonina artifact scatter	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line
AR-03-07-02-2340	Cohonina artifact scatter	Kaibab NF	Recommended ineligible	Fiber-optic line
AR-03-07-02-2342	Cohonina artifact scatter with a possible feature	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line
AR-03-07-02-2343	Cohonina artifact scatter with a possible feature	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line
AR-03-07-02-2345	Lithic scatter	Kaibab NF	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:30(ASM)	Transportation – State Route 64 (in-use)	ASLD	Determined eligible / Criterion D	Fiber-optic line corridor
AZ H:12:48(ASM)	Cohonina artifact scatter	ASLD	Recommended eligible / Criterion D	Fiber-optic line corridor
AZ H:12:52(ASM)	Historic rock alignments	ASLD	Unevaluated	Fiber-optic line

Site Number	Site Description	Land Jurisdiction	Eligibility/Criteria	Project Component
AZ H:12:55(ASM)	Cohonina artifact scatter	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:58(ASM)	Cohonina habitation	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:68(ASM)/ AR-03-07-01-2773	Transmission–APS NE-10 Williams-Grand Canyon Transmission Line	ASLD/Private	Determined eligible / Criterion A	Fiber-optic line / Power feeder line
AZ H:12:85(ASM)	Cohonina artifact scatter with an associated feature	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:86(ASM)	Cohonina artifact scatter	Private	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:87(ASM)	Cohonina habitation	Private	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:89(ASM)	Cohonina habitation	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:92(ASM)	Rock ring (possible wickiup) with an associated feature	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:93(ASM)	Cohonina artifact scatter	ASLD	Recommended ineligible	Fiber-optic line
AZ H:12:94(ASM)	Cohonina habitation	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:98(ASM)	Cohonina habitation	ASLD/Private	Recommended eligible / Criterion D	Fiber-optic line
AZ H:12:99(ASM)	Cohonina artifact scatter with possible features	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ I:5:11(ASM)	Cohonina artifact scatter with a rock feature	ASLD	Determined eligible / Criterion D	Power line
AZ I:5:12(ASM)	Cohonina artifact scatter with a rock feature	ASLD	Determined eligible / Criterion D	Power line
AZ I:5:16(ASM)	Cohonina artifact scatter	ASLD	Unevaluated	Fiber-optic line
AZ I:5:26(ASM)	Cohonina artifact scatter with a rock feature	ASLD	Determined eligible / Criterion D	Collection line/access road

Site Number	Site Description	Land Jurisdiction	Eligibility/Criteria	Project Component
AZ I:5:62(ASM)	Cohonina artifact scatter	ASLD/Private	Determined ineligible	Collection line/access road
AZ I:5:63(ASM)	Navajo sweat lodge with associated artifacts	ASLD	Determined eligible / Criterion A	Collection line/access road
AZ I:5:64(ASM)	Euro-American artifact scatter with an associated feature	ASLD	Determined ineligible	Collection line/access road
AZ I:5:77(ASM)	Euro-American artifact scatter with an associated feature	ASLD	Determined ineligible	Collection line/access road
AZ I:5:78(ASM)	Lithic scatter	ASLD	Determined eligible / Criterion D	Collection line/access road
AZ I:5:79(ASM)	Cohonina artifact scatter	ASLD	Determined ineligible	Collection line/access road
AZ I:5:80(ASM)	Euro-American artifact scatter with an associated feature	Private	Determined Ineligible	Collection line/access road
AZ I:5:81(ASM)	Cohonina artifact scatter	Private	Determined eligible / Criterion D	Substation
AZ I:5:82(ASM)	Cohonina artifact scatter with associated features	ASLD	Recommended eligible / Criterion D	Fiber-optic line
AZ I:5:87(ASM)	Cohonina artifact scatter	Private	Recommended eligible / Criterion D	Fiber-optic line
AZ I:14:5(ASM)	Transportation- Beale Wagon Road	ASLD	Determined eligible / Criteria A and B	Fiber-optic line
APS500-2-8*	Cohonina habitation	Private	Recommended eligible / Criterion D	Fiber-optic line
APS500-2-1*	Cohonina artifact scatter	Private	Recommended eligible / Criterion D	Fiber-optic line
APS500-2-2*	Cohonina artifact scatter	Private	Recommended eligible / Criterion D	Fiber-optic line
APS500-2-3*	Cohonina artifact scatter	Private	Recommended ineligible	Fiber-optic line
—	Grand Canyon Railway	ASLD	Listed / Criteria A and C	Fiber-optic line

* Bild, David, Michael S. Foster, and Erin Davis: 2011 A Cultural Resources Survey of 49.98 Miles (900.69 Acres) of Private Land for the Arizona Public Service Company 500-2 (Navajo-Westwing) 500-kV Transmisson Line between the

Westwing Substation and the Navajo Indian Reservation Boundary, Maricopa, Yavapai, and Coconino Counties, Arizona. Technical Report No. 075107 (500-2e). Logan Simpson Design, Tempe, Arizona.

Table A.2. Cultural Resources within the 3-Mile Analysis Area

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-0003	Prehistoric	Archaic	Unknown	Eligible, Criterion D
AR-03-07-02-0049	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0050	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0051	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0052	Prehistoric	Cohonina	Rock art	Unevaluated
AR-03-07-02-0061	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0062	Prehistoric	Cohonina	Unknown	Unknown
AR-03-07-02-0063	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0064	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0065	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0066	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0067	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0068	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0069	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0070	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0071	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0072	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0073	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0074	Prehistoric	Cohonina	Unknown	Unknown
AR-03-07-02-0075	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0076	Prehistoric	Cohonina	Unknown	Unknown
AR-03-07-02-0077	Prehistoric	Cohonina	Unknown	Unknown
AR-03-07-02-0263	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0264	Prehistoric	Cohonina	Two pithouses, a surface room, and a storage pit	Unevaluated
AR-03-07-02-0265	Prehistoric	Cohonina	Pithouse	Unevaluated
AR-03-07-02-0266	Prehistoric	Cohonina	Three pithouses	Unevaluated
AR-03-07-02-0282	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0283	Prehistoric	Cohonina	Surface room	Unknown
AR-03-07-02-0284	Prehistoric	Archaic	Unknown	Unevaluated
AR-03-07-02-0285	Prehistoric	Cohonina	Pithouse	Unevaluated

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-0286	Prehistoric	Archaic	Unknown	Unevaluated
AR-03-07-02-0287	Prehistoric	Cohonina	Two surface rooms	Unevaluated
AR-03-07-02-0288	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0289	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0290	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0291	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0292	Prehistoric	Archaic	Unknown	Unknown
AR-03-07-02-0293	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0294	Prehistoric	Cohonina	Three pithouses and a surface room	Unevaluated
AR-03-07-02-0295	Prehistoric	Cohonina	Six pithouses	Unevaluated
AR-03-07-02-0296	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0297	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0298	Prehistoric	Cohonina	Pithouse and a surface room	Unevaluated
AR-03-07-02-0299	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0300	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0301	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0302	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0303	Prehistoric	Cohonina	Two surface rooms	Unevaluated
AR-03-07-02-0304	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0305	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0306	Prehistoric	Cohonina	Two surface rooms	Delisted
AR-03-07-02-0307	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0308	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0309	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0313	Prehistoric	Cohonina	Two surface rooms	Unevaluated
AR-03-07-02-0314	Prehistoric	Cohonina	Pithouse and two surface rooms	Unevaluated
AR-03-07-02-0315	Prehistoric	Cohonina	Two pithouses	Unevaluated
AR-03-07-02-0317	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0318	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0319	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0320	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0321	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0322	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0323	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0334	Prehistoric	Cohonina	Unknown	Delisted

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-0335	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0336	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0338	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0339	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0516	Historic	Euro-American	Two structures	Delisted
AR-03-07-02-0526	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0527	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0528	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0725	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0726	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-0727	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-0739	Prehistoric	Cohonina	Seven surface rooms	Unevaluated
AR-03-07-02-0740	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0741	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0744	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0745	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0746	Prehistoric	Cohonina / Sinagua	Roasting pit	Unevaluated
AR-03-07-02-0747	Prehistoric	Cohonina	Unknown	Delisted
AR-03-07-02-0748	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0763	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-0764	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0766	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0778	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-0779	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-0780	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0790	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0791	Prehistoric	Cohonina / Hopi	Rock art	Unevaluated
AR-03-07-02-0792	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-0793	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0794	Prehistoric	Unknown	six rock art, four surface rooms, and a storage pit	Unevaluated
AR-03-07-02-0795	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0849	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0850	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0851	Prehistoric	Cohonina	Unknown	Unevaluated

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-0852	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0853	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0854	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0855	Prehistoric	Cohonina	Three surface rooms	Unevaluated
AR-03-07-02-0856	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0857	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-0858	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0859	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-0860	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0861	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0862	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0863	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0864	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-0891	Prehistoric	Cohonina	Unknown	Eligible, Criterion D
AR-03-07-02-0892	Prehistoric	Cohonina	Water/Soil Control feature	Eligible, Criterion D
AR-03-07-02-0893	Prehistoric	Cohonina	Unknown	Eligible, Criterion D
AR-03-07-02-0894	Prehistoric	Cohonina	Unknown	Eligible, Criterion D
AR-03-07-02-0895	Prehistoric	Cohonina	Unknown	Eligible, Criterion D
AR-03-07-02-0896	Historic	Dine	Ramada feature	Eligible
AR-03-07-02-0897	Prehistoric	Cohonina	Unknown	Eligible, Criterion D
AR-03-07-02-0898	Historic	Dine	Unknown	Eligible
AR-03-07-02-1073	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1128	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1129	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1221	Prehistoric	Cohonina	Three surface rooms and storage pit	Unevaluated
AR-03-07-02-1222	Prehistoric	Cohonina	Three pithouses, three depressions, one surface room, one roasting pit, one midden,	Unevaluated
AR-03-07-02-1223	Prehistoric	Cohonina	Surface room	Unevaluated

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-1224	Prehistoric	Cohonina	Two pithouses, a surface room, and structural mound	Unevaluated
AR-03-07-02-1225	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1226	Prehistoric	Cohonina	Three surface rooms	Unevaluated
AR-03-07-02-1227	Prehistoric	Cohonina	six rock art and a bedrock grinding stone	Unevaluated
AR-03-07-02-1228	Prehistoric	Cohonina	Five surface rooms	Unevaluated
AR-03-07-02-1304	Prehistoric	Cohonina / Pai	Four rock art, two surface rooms, a quarry, a storage pit, a midden	Unevaluated
AR-03-07-02-1385	Prehistoric	Cohonina	Five surface rooms, three pithouses, and three walls	Unevaluated
AR-03-07-02-1394	Prehistoric	Cohonina	Five surface rooms	Unevaluated
AR-03-07-02-1414	Prehistoric	Cohonina	Two surface rooms and a water/soil control features	Unevaluated
AR-03-07-02-1415	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1416	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-1417	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1418	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1419	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1420	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1421	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1422	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1423	Prehistoric	Cohonina	Two pithouses and a storage pit	Unevaluated
AR-03-07-02-1424	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1425	Prehistoric	Cohonina	Two water/soil control features	Unevaluated
AR-03-07-02-1426	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1427	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1428	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1429	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1430	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1431	Prehistoric	Cohonina	Pithouse	Unevaluated

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-1432	Prehistoric	Cohonina	Six storage pits, four surface rooms, three depressions, and a water/soil control feature	Unevaluated
AR-03-07-02-1435	Multicomponent	Cohonina / Havasupai	Unknown	Unevaluated
AR-03-07-02-1436	Multicomponent	Cohonina / Havasupai	Unknown	Unevaluated
AR-03-07-02-1441	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1452	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1453	Prehistoric	Cohonina	Three surface rooms and two pithouses	Unevaluated
AR-03-07-02-1454	Prehistoric	Cohonina	Pithouse, structural mound, and depression	Unevaluated
AR-03-07-02-1462	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1463	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1464	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1465	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1471	Prehistoric	Cohonina	Four surface rooms, two pithouses, two depressions, and a structural mound	Unevaluated
AR-03-07-02-1472	Prehistoric	Cohonina	Three rock art	Unevaluated
AR-03-07-02-1477	Prehistoric	Cohonina	Two surface rooms	Eligible, Criterion D
AR-03-07-02-1509	Prehistoric	Cohonina	Three pithouses, three rock art, and two surface rooms	Unevaluated
AR-03-07-02-1516	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1517	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-1519	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1520	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1521	Unknown	Unknown	Ramada feature	Unevaluated
AR-03-07-02-1522	Prehistoric	Cohonina	Artifact scatter and feature	Eligible
AR-03-07-02-1523	Prehistoric	Cohonina	Pithouse	Unevaluated
AR-03-07-02-1524	Prehistoric	Cohonina	Pithouse	Unevaluated
AR-03-07-02-1525	Prehistoric	Cohonina	Surface room	Unevaluated

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-1526	Prehistoric	Cohonina	Hearth	Unevaluated
AR-03-07-02-1527	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-1528	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-1530	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-1531	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-1532	Historic	Havasupai	Unknown	Unevaluated
AR-03-07-02-1533	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1534	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1535	Prehistoric	Cohonina	Surface room and storage pit	Unevaluated
AR-03-07-02-1536	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1537	Prehistoric	Cohonina	Three surface rooms	Unevaluated
AR-03-07-02-1538	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1539	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1540	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1541	Prehistoric	Unknown	Lithic scatter	Unevaluated
AR-03-07-02-1542	Prehistoric	Cohonina	Two pithouses	Unevaluated
AR-03-07-02-1543	Prehistoric	Cohonina	Surface room	Unevaluated
AR-03-07-02-1544	Prehistoric	Cohonina	Two surface rooms	Unevaluated
AR-03-07-02-1545	Prehistoric	Cohonina	Two surface rooms, two pithouses, two middens	Unevaluated
AR-03-07-02-1555	Prehistoric	Cohonina	Artifact scatter with features	Eligible, Criterion D
AR-03-07-02-1556	Prehistoric	Cohonina	Unknown	Unevaluated
AR-03-07-02-1563	Prehistoric	Cohonina	Rock art	Unevaluated
AR-03-07-02-1564	Prehistoric	Cohonina	Rock art	Unevaluated
AR-03-07-02-1565	Prehistoric	Cohonina	Rock art	Eligible, Criterion D
AR-03-07-02-1982	Prehistoric	Cohonina	One rock ring, cobble structures, and a possible pithouse	Eligible, Criterion D
AR-03-07-02-1993	Prehistoric	Cohonina	Artifact scatter	Unknown
AR-03-07-02-1995	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AR-03-07-02-1997	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AR-03-07-02-1998	Prehistoric	Archaic / Cohonina	Artifact scatter	Unknown

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AR-03-07-02-2000	Prehistoric	Cohonina	Habitation	Eligible, Criterion D
AR-03-07-02-2001	Prehistoric	Cohonina	Artifact scatter	Unknown
AR-03-07-02-2002	Prehistoric	Cohonina	Artifact scatter	Unknown
AR-03-07-02-2341	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AR-03-07-02-2344	Unknown	Unknown	Lithic scatter	Eligible, Criterion D
AR-03-07-02-2346	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:8:23(ASM)	Prehistoric	Cohonina	Two surface structures and artifact scatter	Eligible, Criterion D
AZ H:8:27(ASM)	Prehistoric	Archaic / Cohonina	Artifact scatter	Unevaluated
AZ H:8:28(ASM)	Prehistoric	Unknown	Lithic scatter	Unevaluated
AZ H:8:29(ASM)	Prehistoric	Archaic	Lithic scatter	Unevaluated
AZ H:8:30(ASM)	Prehistoric	Unknown	Lithic scatter	Unevaluated
AZ H:8:31(ASM)	Historic	Euro-American	Hunting blind and artifact scatter	Ineligible
AZ H:8:32(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ H:8:33(ASM)	Prehistoric	Unknown	Lithic scatter	Ineligible
AZ H:8:34(ASM)	Historic	Euro-American	Corral and artifact scatter	Ineligible
AZ H:8:35(ASM)	Historic	Euro-American	Two rock alignments and artifact scatter	Eligible, Criterion D
AZ H:8:38(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:8:39(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:11:34(ASM)	Prehistoric	Unknown	Artifact scatter	Unknown
AZ H:11:93(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ H:11:94(ASM)	Prehistoric	Unknown	Lithic scatter	Ineligible
AZ H:12:3(ASM)	Prehistoric	Unknown	Lithic scatter	Unevaluated
AZ H:12:4(ASM)	Prehistoric	Cohonina	Surface structure and artifact scatter	Unevaluated
AZ H:12:5(ASM)	Prehistoric	Cohonina	Three masonry structures and artifact scatter	Unevaluated
AZ H:12:6(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:12:7(ASM)	Prehistoric	Cohonina	Surface structure and artifact scatter	Unevaluated

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AZ H:12:8(ASM)	Prehistoric	Cohonina	Lithic scatter	Unevaluated
AZ H:12:9(ASM)	Prehistoric	Unknown	Artifact scatter	Unevaluated
AZ H:12:11(ASM)	Prehistoric	Sinagua	Artifact scatter	Unknown
AZ H:12:12(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:12:13(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ H:12:14(NRCS)	Prehistoric	Sinagua	Artifact scatter	Unevaluated
AZ H:12:15(NRCS)	Prehistoric	Cohonina	Artifact scatter	Ineligible
AZ H:12:16(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:12:16(NRCS)	Historic	Euro-American	Artifact scatter	Ineligible
AZ H:12:17(ASM)	Prehistoric	Cohonina	Artifact scatter	Unknown
AZ H:12:17(NRCS)	Multicomponent	Unknown	Hearth and artifact scatter	Ineligible
AZ H:12:19(ASM)	Prehistoric	Cohonina / Sinagua	Three structures and artifact scatter	Eligible, Criterion D
AZ H:12:20(ASM)	Prehistoric	Cohonina / Sinagua	Artifact scatter	Eligible, Criterion D
AZ H:12:21(ASM)	Prehistoric	Cohonina	Two possible structures, two possible pithouses, and an artifact scatter	Eligible, Criterion D
AZ H:12:22(ASM)	Prehistoric	Cohonina	Two possible pithouses and an artifact scatter	Eligible, Criterion D
AZ H:12:23(ASM)	Prehistoric	Cohonina / Sinagua	Three possible pithouses and an artifact scatter	Eligible, Criterion D
AZ H:12:24(ASM)	Prehistoric	Cohonina	Three possible pithouses and an artifact scatter	Eligible, Criterion D
AZ H:12:25(ASM)	Prehistoric	Cohonina	Two possible structures, three possible pithouses, and an artifact scatter	Eligible, Criterion D
AZ H:12:26(ASM)	Prehistoric	Cohonina	Rock alignment and artifact scatter	Eligible, Criterion D
AZ H:12:27(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:29(ASM)	Prehistoric	Cohonina	Structural mound, rock pile, and artifact scatter	Eligible, Criterion D

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AZ H:12:36(ASM)	Multicomponent	Cohonina / Euro-American	Historic road berm and artifact scatter	Eligible, Criterion D
AZ H:12:37(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:42(ASM)	Historic	Basque	Sheepherders camp	Ineligible
AZ H:12:49(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:12:50(ASM)	Prehistoric	Cohonina	Pithouse and artifact scatter	Eligible, Criterion D
AZ H:12:51(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:12:53(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ H:12:54(ASM)	Multicomponent	Cohonina / Euro-American	Brush shelter and artifact scatter	Unevaluated
AZ H:12:56(ASM)/ NA5137	Prehistoric	Cohonina	Two hearths and an artifact scatter	Eligible, Criterion D
AZ H:12:57(ASM)	Prehistoric	Cohonina	Pithouse and artifact scatter	Eligible, Criterion D
AZ H:12:66(ASM)	Historic	Euro-American	Road	Unevaluated
AZ H:12:67(ASM)	Prehistoric	Unknown	Artifact scatter	Unevaluated
AZ H:12:69(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:70(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ H:12:72(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ H:12:73(ASM)	Prehistoric	Cohonina	Surface structure and artifact scatter	Eligible, Criterion D
AZ H:12:74(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:76(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:77(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:78(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:79(ASM)	Prehistoric	Cohonina	Surface structure and artifact scatter	Eligible, Criterion D
AZ H:12:80(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ H:12:81(ASM)	Prehistoric	Cohonina	Surface structure and artifact scatter	Eligible, Criterion D

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AZ H:12:83(ASM)	Prehistoric	Cohonina	Two surface structures and artifact scatter	Eligible, Criterion D
AZ H:12:88(ASM)	Prehistoric	Cohonina	Habitation	Eligible, Criterion D
AZ H:12:90(ASM)	Historic	Euro-American	Artifact scatter	Ineligible
AZ H:12:91(ASM)	Prehistoric	Cohonina	Artifact scatter with rock feature	Eligible, Criterion D
AZ H:12:95(ASM)	Prehistoric	Cohonina	Artifact scatter	Ineligible
AZ H:12:96(ASM)	Prehistoric	Cohonina	Artifact scatter with rock feature	Unevaluated
AZ H:12:97(ASM)	Prehistoric	Cohonina	Artifact scatter with rock feature	Unevaluated
AZ H:12:98(ASM)	Prehistoric	Cohonina	Habitation	Eligible, Criterion D
AZ H:12:99(ASM)	Prehistoric	Cohonina	Habitation	Eligible, Criterion D
AZ I:5:7(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ I:5:8(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ I:5:9(ASM)	Prehistoric	Unknown	Masonry structure	Eligible, Criterion D
AZ I:5:13(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ I:5:14(ASM)	Prehistoric	Unknown	Lithic scatter	Eligible, Criterion D
AZ I:5:18(ASM)	Prehistoric	Cohonina	Artifact scatter with rock feature	Eligible, Criterion D
AZ I:5:19(ASM)	Historic	Euro-American	Artifact scatter	Ineligible
AZ I:5:20(ASM)	Historic	Euro-American	Artifact scatter	Ineligible
AZ I:5:21(ASM)	Multicomponent	Cohonina / Euro-American	Artifact scatter with features	Ineligible
AZ I:5:22(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ I:5:23(ASM)	Prehistoric	Archaic	Artifact scatter	Ineligible
AZ I:5:24(ASM)	Unknown	Unknown	Lithic scatter	Ineligible
AZ I:5:25(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ I:5:27(ASM)	Prehistoric	Cohonina	Artifact scatter	Ineligible
AZ I:5:28(ASM)	Prehistoric	Cohonina	Artifact scatter	Ineligible

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AZ I:5:29(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ I:5:30(ASM)	Unknown	Unknown	Lithic scatter	Ineligible
AZ I:5:56(ASM)	Unknown	Unknown	Lithic scatter	Eligible, Criterion D
AZ I:5:57(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ I:5:58(ASM)	Unknown	Unknown	Lithic scatter	Ineligible
AZ I:5:59(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ I:5:60(ASM)	Historic	Dine	Artifact scatter with feature	Eligible, Criterion A
AZ I:5:61(ASM)	Multicomponent	Cohonina / Euro-American	Artifact scatter with features	Ineligible
AZ I:5:65(ASM)	Historic	Euro-American	Artifact scatter with feature	Ineligible
AZ I:5:74(ASM)	Historic	Dine / Euro-American	Artifact scatter with feature	Ineligible
AZ I:5:75(ASM)	Historic	Dine / Euro-American	Artifact scatter with feature	Ineligible
AZ I:5:76(ASM)	Historic	Dine / Euro-American	Artifact scatter with feature	Ineligible
AZ I:5:82(ASM)	Prehistoric	Cohonina	Artifact scatter	Eligible, Criterion D
AZ I:5:83(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:84(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:85(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:86(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:88(ASM)	Prehistoric	Cohonina	Artifact scatter with features	Eligible, Criterion D
AZ I:5:89(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:90(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:91(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:92(ASM)	Multicomponent	Cohonina / Euro-American	Artifact scatter	Unevaluated
AZ I:5:93(ASM)	Unknown	Unknown	Lithic scatter	Unevaluated
AZ I:5:94(ASM)	Unknown	Unknown	Lithic scatter	Unevaluated
AZ I:5:95(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:96(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:97(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated

Site Number	Temporal Affiliation	Cultural Affiliation	Description	NRHP Eligibility
AZ I:5:98(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
AZ I:5:99(ASM)	Unknown	Unknown	Artifact scatter	Unevaluated
AZ I:5:100(ASM)	Unknown	Unknown	Lithic scatter	Unevaluated
AZ I:5:101(ASM)	Unknown	Unknown	Lithic scatter	Unevaluated
AZ I:5:102(ASM)	Unknown	Unknown	Lithic scatter	Unevaluated
AZ I:5:103(ASM)	Unknown	Unknown	Lithic scatter	Eligible, Criterion D
AZ I:5:104(ASM)	Prehistoric	Cohonina	Artifact scatter	Unevaluated
NA1572	Unknown	Unknown	Unknown	Unknown
NA2115	Unknown	Unknown	Unknown	Unknown
NA2116	Unknown	Unknown	Unknown	Unknown
NA5133	Unknown	Unknown	Unknown	Unknown
NA5134	Unknown	Unknown	Unknown	Unknown
NA5135	Unknown	Unknown	Unknown	Unknown
NA5136	Unknown	Unknown	Unknown	Unknown
NA5138	Unknown	Unknown	Unknown	Unknown
NA5139	Unknown	Unknown	Unknown	Unknown
NA5140	Unknown	Unknown	Unknown	Unknown
NA5141	Unknown	Unknown	Unknown	Unknown
NA5142	Unknown	Unknown	Unknown	Unknown
NA5143	Unknown	Unknown	Habitation	Unknown
NA5144	Unknown	Unknown	Unknown	Unknown
NA5146	Unknown	Unknown	Unknown	Unknown
NA5149	Unknown	Unknown	Unknown	Unknown
NA5151	Unknown	Unknown	Unknown	Unknown
NA5152	Unknown	Unknown	Unknown	Unknown
NA5153	Unknown	Unknown	Unknown	Unknown
NA5154	Unknown	Unknown	Unknown	Unknown
NA8159	Prehistoric	Unknown	Rock art	Unknown
NA11142	Historic	Dine	Sweat lodge	Unevaluated
NA11143	Unknown	Unknown	Lithic scatter	Unevaluated
NA11144	Historic	Dine	Sweat lodge	Unevaluated
NA11238	Prehistoric	Cohonina	Habitation	Unevaluated
NA14459	Prehistoric	Cohonina	Habitation	Eligible, Criterion D
NA20693	Unknown	Unknown	Unknown	Unknown
NA20694	Unknown	Unknown	Unknown	Unknown

Table A.3. Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	Sound Level (dBA)	Qualitative Description
Carrier deck jet operation	140	–
Civil defense siren (100 feet)	130	Pain threshold
Jet takeoff (200 feet)	120	Deafening
Auto horn (3 feet) Pile driver (50 feet) Rock music concert environment	110	Maximum vocal effort
Jet takeoff (2,000 feet) Shout (0.5 foot) Ambulance siren (100 feet) Newspaper press (5 feet) Power lawn mower (3 feet)	100	–
Heavy truck (50 feet) Power mower Motorcycle (25 feet) Propeller plane flyover (1,000 feet)	90	Very loud/annoying; hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet) Garbage disposal (3 feet) High urban environment	80	Very loud
Passenger car, 65 mph (25 feet) Living room stereo (15 feet) Vacuum cleaner (3 feet)	70	Loud/intrusive (telephone use difficult)
Air conditioning unit (20 feet) Human voice (3 feet) Department store environment	60	–
Light auto traffic (50 feet) Residential air conditioner (50 feet) Private business office environment	50	Moderate/Quiet
Living room/bedroom bird calls (distant)	40	–
Library soft whisper (5 feet) Quiet bedroom environment	30	Very quiet
Broadcasting/recording studio	20	Faint
–	10	Just audible
–	0	Threshold of human audibility

Source: Adapted from Table E of *Assessing and Mitigating Noise Impacts* (New York Department of Environmental Conservation 2001).

Table A.4. Acres of Temporary and Permanent Surface Disturbance to Soils in the Project Area

Soil Association (Soil Type)	TEU* Map Symbol	Properties and Management Implications	Erosion Hazard	Acres in Project Area+	Percentage of Project Area
Ashfork gravelly clay loam: Aridic Argiustolls Slopes: 1 to 15 percent	—	Clay loam upland, well drained. ***Management Implications:*** This unit is used for rangeland and wildlife habitat. The main limitations for development are shallow soil depth to bedrock and shrink-swell potential.	Slight	33.3	2.8%
Aut gravelly loam: Aridic Calciustolls Slopes: 0 to 8 percent	—	Loamy upland, well drained. ***Management Implications:*** This unit is used for rangeland and wildlife habitat. The main limitation for development is shallow soil depth to bedrock.	Slight	36.3	3.0%
Aut-Cross association: Aridic Calciustolls and Lithic Argiustolls Slopes: Moderate	—	Loamy upland and shallow loamy, well drained. ***Management Implications:*** This unit is used for rangeland and wildlife habitat. The main limitation for development is shallow soil depth to bedrock. Also, the stony ground surface may impede some management activities.	Slight	93.4	7.8%
Aut-Lynx association: Aridic Calciustolls and Cumulic Haplustolls Slopes: Gently	—	Loamy upland and Loamy wash, well drained. ***Management Implications:*** This unit is used for rangeland and wildlife habitat. The main limitations for development are shallow soil depth to bedrock, shrink-swell potential, and possible seasonal flooding.	Slight	13.5	1.1%
Deama stony loam: Lithic Calciustolls Slopes: 1 to 15 percent	—	Shallow loamy, well drained. ***Management Implications:*** This unit is used for grazeable woodland, firewood harvesting, and wildlife habitat. The main limitation for development is shallow soil depth to bedrock.	Slight-moderate	48.0	4.0%

Soil Association (Soil Type)	TEU* Map Symbol	Properties and Management Implications	Erosion Hazard	Acres in Project Area+	Percentage of Project Area
Deama-Rock outcrop complex: Lithic Calciustolls Slopes: 8 to 30 percent	—	Shallow loamy, well drained. ***Management Implications:*** This unit is used for grazeable woodland, firewood harvesting, and wildlife habitat. The main limitation for development is shallow soil depth to bedrock.	Slight-moderate	85.9	7.1%
Deama-Toqui complex: Lithic Calciustolls and Lithic Haplustalfs Slopes: 0 to 8 percent	—	Shallow loamy, well drained. ***Management Implications:*** This unit is used for grazeable woodland, firewood harvesting, and wildlife habitat. The main limitation for development is shallow soil depth to bedrock.	Slight-moderate	98.7	8.2%
Disterheff very gravelly sandy clay loam: Vertic Haplustalfs Slopes: 1 to 15 percent	—	Clay loam upland, well drained. ***Management Implications:*** This unit is used for rangeland and wildlife habitat. The main limitations for development are shrink-swell potential, and sloping ground.	Slight	150.5	12.5%
Kopie-Sevilleta association: Lithic Ustochrepts and Ustollic Haplargids Slopes: moderate	—	Sandstone upland and clay loam upland, well drained. ***Management Implications:*** This unit is used for rangeland, woodland, and wildlife habitat. The main limitations for development are shrink-swell potential, and shallow soil depth to bedrock.	Kopie soil is not prone to erosion. Sevilleta soil is highly susceptible to erosion by water.	54.5	4.5%
Lithic Ustochrepts (calcareous, loamy-skeletal) Slopes: 0 to 15 percent	172	Gravelly fine sandy loam. ***Management Implications:*** These soils are formed from the Moenkopi Formation and wherever this unit is found there is a noticeable lack of vegetative ground cover, suggesting there is something naturally in the soils restricting ground cover.	Slight	29.8	2.5%

Soil Association (Soil Type)	TEU* Map Symbol	Properties and Management Implications	Erosion Hazard	Acres in Project Area+	Percentage of Project Area
Lithic Ustochrepts (calcareous, loamy-skeletal)/Typic Ustochrepts (loamy-skeletal, carbonatic) Slopes: 0 to 15 percent	277	Gravelly very fine sandy loam/gravelly very fine sandy loam. ***Management Implications:*** Shallow depths and high rock context limits mechanical treatments; these soils contain significant quantities of lime through the profile and a pH of 8 is common. Excessive ground disturbance, which will bring more calcareous soil to the surface, should be avoided.	Moderate	11.3	0.9%
Pachic Argiustolls (Fine) Slopes: 0 to 5 percent	36	Deep, gravelly clay loam. ***Management Implications:*** These soils have a low bearing strength when wet (surface and clay subsurface horizons are generally wet for short periods following heavy rainfall) and is prone to gully erosion due to flooding.	Severe	37.2	3.1%
Palma sandy loam: Ustollic Haplargids Slopes: 0 to 5 percent	—	Sandy loam upland, well drained. ***Management Implications:*** This unit is used for rangeland and wildlife habitat. It can be cultivated with irrigation. This unit has few limitations for development but may be prone to settling if structures are built on it. Adequate compaction would reduce this problem.	Palma soil is not prone to erosion by water but is highly susceptible to erosion by wind.	27.9	2.3%
Petrocalcic Calciustolls (loamy, carbonatic)/Typic Calciustolls (fine-loamy, carbonatic) Slopes: 0 to 15 percent	591	Shallow, very gravelly loam/very gravelly loam complex. ***Management Implications:*** Limitations for this unit are associated with the restrictive layer that occurs at shallow depths and is impenetrable to roots.	Slight	25.1	2.1%

Soil Association (Soil Type)	TEU* Map Symbol	Properties and Management Implications	Erosion Hazard	Acres in Project Area+	Percentage of Project Area
Springerville very stoney clay: Aridic Haplusterts Slopes: 0 to 8 percent	—	Clayey upland, well drained. ***Management Implications:*** This unit is used for rangeland and wildlife habitat. The main limitations for development are shallow soil depth to bedrock and shrink-swell potential.	Slight	19.5	1.6%
Thunderbird-Rock outcrop complex: Aridic Argiustolls Slopes: 30 to 60 percent	—	Clay loam upland, well drained. ***Management Implications:*** This unit is used for grazeable woodland, firewood harvesting, and wildlife habitat. The main limitations for development are shallow soil depth to bedrock, the inclusion of large stones in the soil, shrink-swell potential, and sloping ground. The bedrock is extremely hard, and excavators often resort to blasting.	Slight-moderate	20.2	1.7%
Thunderbird-Springerville association: Aridic Argiustolls and Aridic Haplusterts Slopes: Strongly	—	Clay loam upland and Clayey upland, well drained. ***Management Implications:*** This unit is used for grazeable woodland, firewood harvesting, and wildlife habitat. The main limitations for development are shallow soil depth to bedrock, shrink-swell potential, and sloping ground.	Slight-moderate	77.6	6.5%
Typic Argiustolls (fine, montmorillonitic)/ Typic Argiustolls (clayey-skeletal, montmorillonitic) Slopes: 0 to 15 percent	586	Very gravelly clay loam/moderately deep, very cobbly clay loam complex. ***Management Implications:*** Shallow depth to clay subsoil may restrict some management activities such as unsurfaced roads and mechanical treatment for revegetation purposes (which are mostly precluded in this unit because of surface rock fragments).	Slight	46.7	3.9%

Soil Association (Soil Type)	TEU* Map Symbol	Properties and Management Implications	Erosion Hazard	Acres in Project Area+	Percentage of Project Area
Typic Argiustolls (fine, montmorillonitic)/ Typic Argiustolls (Fine-loamy) Slopes: 0 to 15 percent	599	Fine, very gravelly clay loam/very gravelly loam complex. ***Management Implications:*** None specified.	Slight	155.7	13.0%
Typic Argiustolls (clayey-skeletal, montmorillonitic)/ Typic Argiustolls (fine, montmorillonitic)/ Rock Outcrops complex Slopes: 15 to 40 percent	589	Moderately deep, very cobbly clay loam. ***Management Implications:*** Components have moderate sheet/rill erosion hazard and are susceptible to gully erosion. Slope and surface rock fragments restrict most management activities.	Moderate	7.4	0.6%
Typic Calciustolls (fine-loamy, carbonatic)/ Petrocalcic Calciustolls (loamy, carbonatic) Slopes: 0 to 15 percent	592	Very gravelly loam/shallow, very gravelly loam complex. ***Management Implications:*** A pH of 8 is common in the subsurface horizon. Limitations for this unit are associated with the restrictive layer that occurs at shallow depths and is impenetrable to roots.	Slight	37.7	3.1%
Vertic Argiustolls (fine, montmorillonitic)/ Vertic Argiustolls (clayey-skeletal, montmorillonitic) Slopes: 0 to 15 percent	514	Deep, very gravelly clay loam/moderately deep, very cobbly clay loam complex. ***Management Implications:*** Operations which mix clayey subsurface horizons with the soil surface will reduce potential site productivity and the probability of success of some management activities like revegetation.	Slight	11.7	1.0%

Soil Association (Soil Type)	TEU* Map Symbol	Properties and Management Implications	Erosion Hazard	Acres in Project Area+	Percentage of Project Area
Zeigler gravelly loam: Aridic Argiustolls Slopes: 0 to 8 percent	—	Cinder upland, well drained. ***Management Implications:*** This unit is used for grazeable woodland, firewood harvesting, and as a source of cinder gravel. This unit has few limitations for development.	Slight	9.6	0.8%
Ziegler-Cross association: Aridic Argiustolls and Lithic Argiustolls Slopes: Moderate	—	Cinder upland and Basalt upland, well drained. ***Management Implications:*** Ziegler soils are used as grazeable woodland, for firewood harvesting, and as a source of cinder gravel. Cross soils are used for livestock grazing and wildlife habitat. Zeigler soil has few limitations for development. The main limitations of Cross soils for development are shallow soil depth to bedrock, shrink-swell potential, and sloping ground.	Slight-moderate risk of erosion by water. Slight hazard of erosion by wind.	36.9	3.1%

* Terrestrial Ecosystem Unit (Forest Service, Southwest Region, 1991).

+ Rounded to 0.1 acre; may include acres of the project area covered by hardened surfaces (NRCS 2022a).

Table A.5. Watershed Condition Classification Ratings

Watershed Indicator	Rabbit Canyon	Dent and Sayer Tank	Big Hole Tank	Miller Wash Headwaters	Rio Tank	North Tank	Middle Spring Valley Wash	Smoot Lake	Lower Red Lake Wash
Aquatic Biota	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Riparian/ Wetland Vegetation	Fair	Poor	Good	Good	Poor	Good	Good	Poor	Good
Water Quality	Fair	Fair	Good	Fair	Good	Good	Fair	Good	Good
Water Quantity	Fair	Fair	Good	Fair	Good	Good	Good	Good	Good
Aquatic Habitat	Fair	Good	Good	Good	Good	Good	Good	Fair	Good
Roads and Trails	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Soils	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Fire Effect/ Regime	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Good	Fair
Forest Cover	-	Fair	Good	Fair	Good	Good	Fair	Good	Good
Forest Health	Good	Good	Good	Good	Good	Good	Good	Good	Good
Terrestrial Invasive Species	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Rangeland	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair

Forest Service 2011

Table A.6. Watershed Condition Analysis

Indicator	Description of Indicator	Analysis of Projects Potential to Impact
Water Quality	This indicator addresses the expressed alteration of physical, chemical, and biological components of water quality.	The Project includes the installation of a proposed fiber-optic line and three underground electrical collection lines; construction of a substation, switchyard, APS line tap, and microwave tower site; and access road construction. These Project activities would disturb more than 1 acre of land; therefore, the Project would require a SWPPP and coverage under the Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit administered by Arizona Department of Environmental Quality. The SWPPP would include control measures that would be implemented during construction that would prevent the discharge of pollutants and subsequent impacts to water quality from sediment transport in stormwater flows. Therefore, potential impacts from the Project to water quality are anticipated to be negligible and would not degrade this watershed indicator in any of the nine watersheds.
Water Quantity	This indicator addresses changes to the natural flow regime with respect to the magnitude, duration, or timing of the natural streamflow hydrograph in relation to Forest Service watershed conditions.	There would be no change in water quantity by the proposed action. The existing flow regimes of the ephemeral surface waters within the nine watersheds would not be altered by the Project activities.
Aquatic Habitat	This indicator addresses aquatic habitat condition with respect to habitat fragmentation, large woody debris, and channel shape and function.	The proposed action is not anticipated to degrade aquatic habitats, cause habitat fragmentation, or change the current channel shape or function. Surface waters in the project area that would be impacted by construction in the short and long term are ephemeral and generally only flow only in direct response to localized precipitation events; therefore, the amount of aquatic habitat in the project area is negligible. Implementation of control measures as described in the Project's SWPPP and additional project design features would minimize and avoid degradation of this watershed indicator during construction.

Indicator	Description of Indicator	Analysis of Projects Potential to Impact
Aquatic Biota	This indicator addresses the distribution, structure, and density of native and introduced aquatic fauna.	The proposed action is not anticipated to have impacts to the distribution, structure, and density of native and introduced aquatic fauna. Drainage features in the project area and to 0.25 mile downstream are ephemeral and generally only flow in direct response to localized precipitation events; therefore, the presence of aquatic biota in the project area is very unlikely.
Riparian/Wetland Vegetation	This indicator addresses the function and condition of riparian vegetation along streams, water bodies, and wetlands.	The proposed action would have no impacts on the function and condition of riparian vegetation along streams, water bodies, and wetlands because there is no riparian vegetation present in the project area.
Roads and Trails	This indicator addresses changes to the hydrologic and sediment regimes because of the density, location, distribution, and maintenance of the road and trail network.	Twenty-eight miles of existing access roads and up to 18 miles of new access roads would be used during construction and operation of the proposed action. The Project would implement design features during construction and operations to minimize impacts erosion on existing roads and subsequent impacts on water quality from sediment transport. No trails would be impacted.
Soils	This indicator addresses alteration to natural soil condition, including productivity, erosion, and chemical contamination.	Soil disturbances from construction of the proposed action includes vegetation removal, use of heavy equipment and machinery, grading, excavation, and backfilling, and trenching. Portions of the project area are in areas with clay soils that are susceptible to trafficability impacts when wet. Across the project area, limiting Project activities to times when soils are dry, frozen, or snow packed and implementing the design features listed above would minimize soil erosion from Project construction. Additionally, soil erosion potential can be minimized in areas of slopes greater than 15 percent by minimizing the length and steepness of the road in these areas, incorporating stormwater controls in the Project design, strengthening the road surface, and stabilizing exposed soils during construction. Prior to construction, the Proponent would coordinate with the Forest Service Engineer to determine the appropriate site-specific measures necessary to stabilize slopes and minimize soil erosion.

Indicator	Description of Indicator	Analysis of Projects Potential to Impact
Fire Regime or Wildfire	This indicator addresses the potential for altered hydrologic and sediment regimes because of departures from historical ranges of variability in vegetation, fuel composition, fire frequency, fire severity, and fire pattern.	Project construction and operations would not impact fire regimes or wildfires. The Forest Service would require the contractor to implement standard practices for fire protection during construction and operation of the facilities.
Forest Cover	This indicator addresses the potential for altered hydrologic and sediment regimes because of the loss of forest cover on NFS lands.	The Project is anticipated to cause a negligible loss of forest cover within the watersheds. This negligible loss would not be expected to result in the downgrading of this condition rating for any of the nine watersheds.
Rangeland Vegetation	This indicator addresses effects on soil and water because of the vegetative health of rangelands.	The Project is anticipated to have minor and temporary impacts on rangeland vegetation with negligible subsequent impacts on vegetative rangeland health. There would be no lasting change in existing range allotments or conditions within the watersheds as a result of implementation of the Project.
Terrestrial Invasive Species	This indicator addresses potential effects on soil, vegetation, and water resources because of terrestrial invasive species (including vertebrates, invertebrates, and plants).	The Project is not anticipated to introduce or spread terrestrial invasive species and noxious weeds. Standard practices for construction include the BMPs listed in Table 7, such as the cleaning of all equipment and vehicles being brought onto and leaving Forest Service lands.
Forest Health	This indicator addresses forest mortality effects on hydrologic and soil function because of major invasive and native forest insect and disease outbreaks and air pollution.	The Project is not anticipated to cause any major invasive or native forest insect or disease outbreaks that would impact forest health.