

# Shallow Basket Energy, LLC, Shallow Basket Energy Project Draft Environmental Assessment

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## ACRONYMS AND ABBREVIATIONS

|                                       |  |
|---------------------------------------|--|
| AC                                    | alternating current                                    |
| ARPA                                  | Archaeological Resources Protection Act                |
| BESS                                  | Battery Energy Storage System                          |
| BIA                                   | Bureau of Indian Affairs                               |
| BMP                                   | best management practice                               |
| CEQ                                   | Council on Environmental Quality                       |
| CFR                                   | Code of Federal Regulations                            |
| CGP                                   | Construction General Permit                            |
| CO                                    | carbon monoxide  |
| CWA                                   | Clean Water Act  |
| DC                                    | direct current   |
| DESCRM                                | Division of Environmental, Safety                      |
| DF                                    | design features  |
| DOI                                   | Department of the Interior                             |
| EA                                    | Environmental Assessment                               |
| EPA                                   | Environmental Protection Agency                        |
| ESA                                   | Endangered Species Act                                 |
| ESC                                   | erosion and sediment control                           |
| FEMA                                  | Federal Emergency Management Agency                    |
| GHG                                   | greenhouse gases                                       |
| GIS                                   | geographic information system                          |
| IAM                                   | Indian Affairs Manual                                  |
| J 36                                  | Jicarilla Road 36                                      |
| JAN                                   | Jicarilla Apache Nation                                |
| JANPA                                 | Jicarilla Apache Nation Power Authority                |
| kV                                    | kilovolt   |
| MET                                   | meteorological   |
| MM                                    | mitigation measures                                    |
| MW                                    | megawatt   |
| NAGPRA                                | Native American Graves Protection and Repatriation Act |
| NEPA                                  | National Environmental Policy Act                      |
| NHPA                                  | National Historic Preservation Act                     |
| NM 537                                | New Mexico Highway 537                                 |
| NO <sub>2</sub>                       | nitrogen dioxide                                       |
| NPDES                                 | National Pollutant Discharge Elimination System        |
| NRCS                                  | Natural Resources Conservation Service                 |
| NRHP                                  | National Register of Historic Places                   |
| NRS                                   | National Renewable Solutions                           |
| O&M                                   | operation and maintenance                              |
| O <sub>3</sub>                        | Ozone  |
| Pb                                    | lead   |
| PM <sub>10</sub> and PM <sub>25</sub> | particulate matter                                     |
| PNM                                   | Public Service Company of New Mexico                   |
| PV                                    | photovoltaic   |
| REC                                   | recognized environmental contaminants                  |

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|                    |  |
|--------------------|--|
| ROW                | right-of-way                             |
| SCADA              | supervisory control and data acquisition |
| SO <sub>2</sub>    | sulfur dioxide                           |
| SWPPP              | Stormwater Pollution Prevention Plan     |
| tCO <sub>2</sub> e | Carbon dioxide equivalent                |
| U.S.               | United States                            |
| U.S. 550           | U.S. Highway 550                         |
| USACE              | United States Army Corps of Engineers    |
| USC                | United States Code                       |
| WSR                | wind and solar resource                  |

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## 1. INTRODUCTION

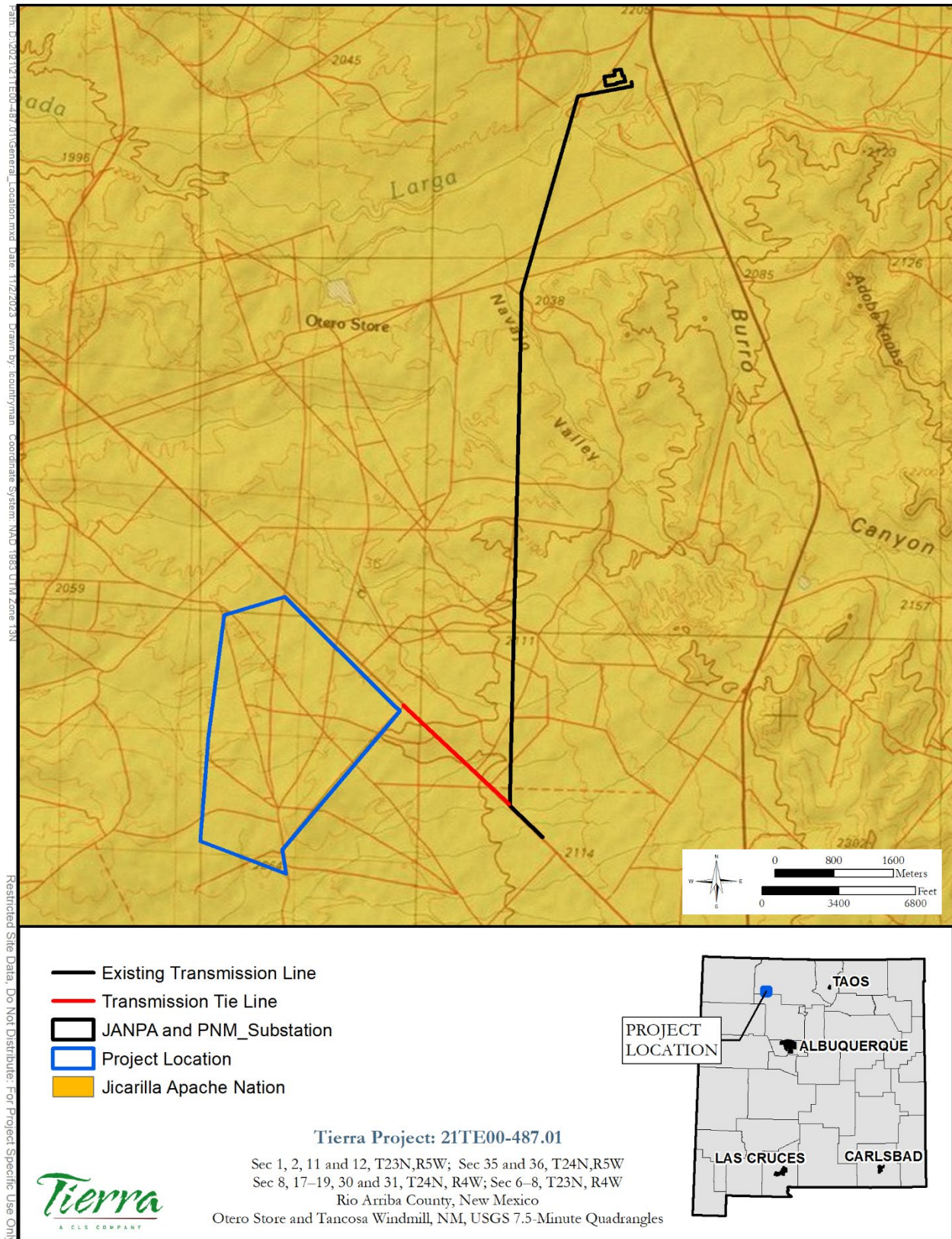
Shallow Basket Energy, LLC (the Applicant), proposes to develop a solar electrical power generation facility with up to 190-megawatt (MW) alternating current (AC) of ground-mounted photovoltaic (PV) arrays and a battery storage system on approximately 1,500 acres, with ancillary project components on the Jicarilla Apache Nation (JAN). The facility will connect to an existing JAN Power Authority (JANPA) substation (colocated with a Public Service Company of New Mexico [PNM] substation) via an approximately 1-mile-long transmission tie line being constructed and permitted by JANPA on JAN lands east of Counselor, New Mexico.

The proposed project is in northwestern New Mexico, just west of New Mexico Highway 537 (NM 537), approximately 5 miles north of United States Highway 550 (U.S. 550), and approximately 11.8 miles east of Counselor in Rio Arriba County. Specifically, the proposed project is located within an unplatted portion of the JAN on Sections 1, 2, 11, 12, and 14, Township 23 North, Range 5 West and Sections 35 and 36, Township 24 North, and Range 5 West, as indicated on the Otero Store and Tancosa Windmill, New Mexico U.S. Geological Survey 7.5-minute quadrangles (Figure 1 and Figure 2). The northeastern portion of the proposed project area parallels Jicarilla Road 36 (J 36), and there are several unnamed dirt roads located throughout. A partially constructed solar facility is located approximately 1.5 miles southeast.

The project will be owned and operated by the Applicant and its parent company National Renewable Solutions (NRS). NRS purchased the project from Affordable Solar in December 2022. The proposed facilities will be operated under a wind and solar resource (WSR) lease to the JAN that will require authorization from the Bureau of Indian Affairs (BIA). JANPA will construct, own, and operate the aerial transmission tie line needed to connect the solar facility with JANPA's existing 345/115-kilovolt (kV) switchyard. The Applicant is requesting a 25-year lease term with the potential for 5-year extensions up to an additional 25 years. Construction is anticipated to start in 2024 and would take approximately 10–12 months. The facility will be used year-round.

### ***1.1. Purpose and Need***

The purpose and need of the proposed project is to (1) provide a long-term, viable economic revenue base (lease income) and job opportunities for the JAN; (2) allow the JAN, in partnership with the Applicant, to optimize the use of the lease site while maximizing the potential economic benefit to the JAN; and (3) develop clean renewable electricity generation to help PNM meet Energy Transition Act (New Mexico Statutes Chapter 62, Article 18) renewable energy mandates, which seek to bring New Mexico to 100% renewable energy. The project would also help meet the Federal government's goals to eliminate or reduce greenhouse gas (GHG) emissions and promote the deployment of renewable energy technologies.



**Figure 1. Project location.**



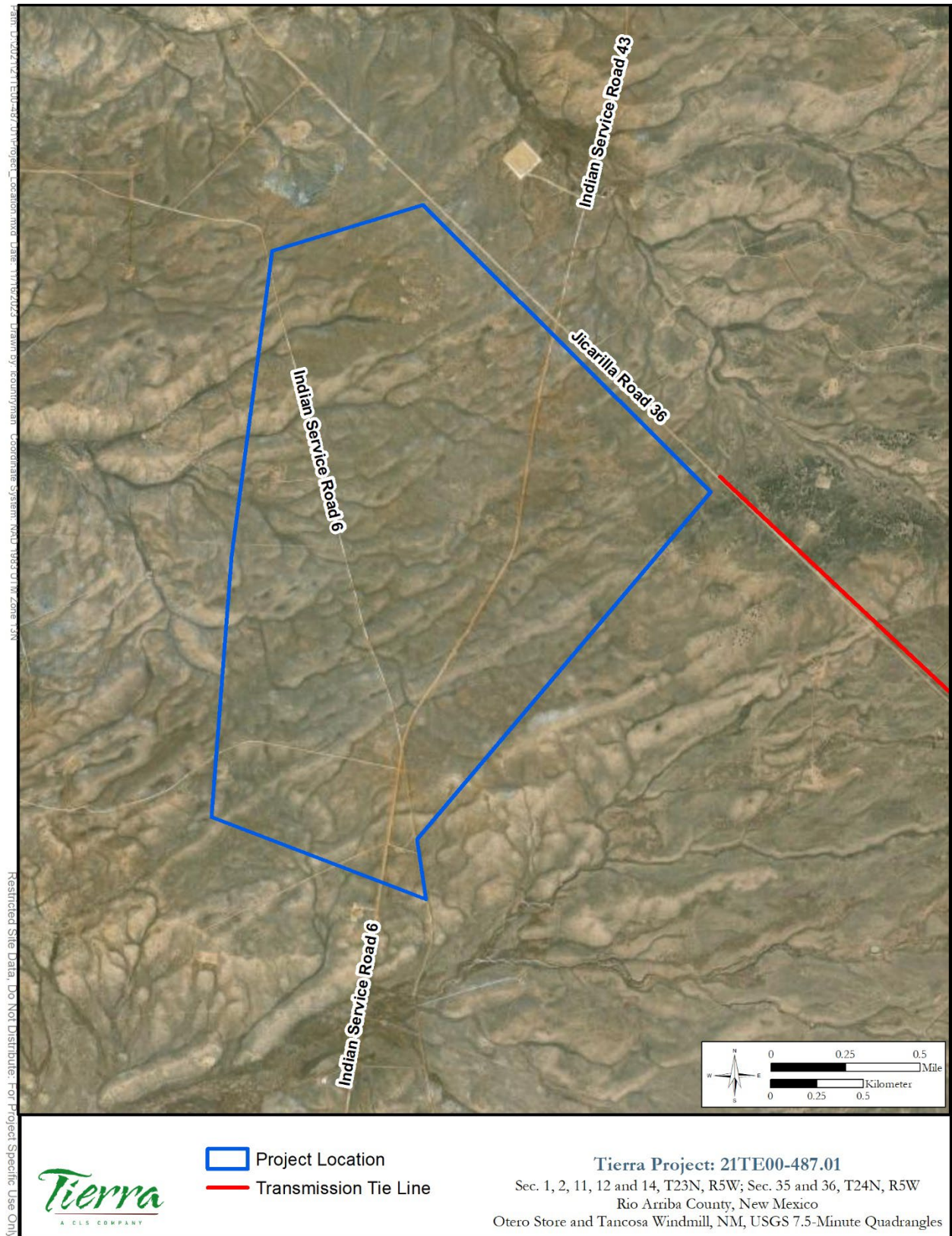


Figure 2. Project detail.



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## ***1.2. Agency Purpose and Need***

The need for the BIA action is established by the BIA's responsibility to respond to a request for a lease approval and right-of-way (ROW) applications between the JAN and the Applicant over or across lands held in trust for Indian Tribes. The BIA must meet its responsibility to review and approve actions on Tribal lands held in trust for the benefit of the JAN (42 United States Code [USC] §§ 4321 et seq.).

The BIA purpose, pursuant to 25 USC § 415, is to deny, grant, or grant with modifications the solar energy ground leases for the solar fields and associated ROW agreements between the JAN and the Applicant.

## ***1.3. Decision to be Made***

In accordance with the National Environmental Policy Act (NEPA) of 1969, the BIA and JAN are responsible for determining whether a proposed project might have a significant impact on Tribal and adjacent lands. If the parties decide that the effects of the project would not be significant, the BIA would prepare and sign a Finding of No Significant Impact for the project to proceed. The Federal action required is BIA review, approval, and issuance of a WSR lease authorization for energy facilities.

## ***1.4. Plan Conformance and Relationship to Statutes and Regulations***

### **1.4.1. Plan Conformance**

The Proposed Action is subject to and in conformance with the JAN Tribal Council and BIA Office of Trust Services Division of Natural Resources management goals. The BIA's Division of Natural Resources management goals are identified in the Office of Trust Services list of responsibilities associated with management and protection of trust and restricted lands, natural resources, and real estate services.

### **1.4.2. Supporting Documents**

The JAN has established a 5,600-acre special use area for solar energy generation and related solar energy storage projects (Resolution No. 2019-R-246-10). The Proposed Action is consistent with the resolution. It is also consistent with the JAN Utility Authority Strategic Plan for Energy Efficiency and Renewable Energy Development.

### **1.4.3. Relationship to Statutes and Regulations**

The Proposed Action is subject to the following regulations and actions:

- NEPA (42 USC 4321–4347);
- Section 106 of the National Historic Preservation Act (NHPA) (see Attachment 3: Notification of Completion of Section 106 Consultation);
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001 et seq.);
- Migratory Bird Treaty Act;
- Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508);
- 59 Indian Affairs Manual (IAM) Chapter 3;
- Section 7 of the Endangered Species Act (ESA) (see Attachment 2. Biological Assessment);

- 
- Section 404 of the Clean Water Act (CWA) if any waters of the U.S. may be impacted by the project;
  - National Pollutant Discharge Elimination System (NPDES) general permit for stormwater discharges associated with construction activity in compliance with the Environmental Protection Agency (EPA);
  - JAN Environmental Protection Code Title 14; and
  - JAN Water Code Ordinance.

Department of the Interior (DOI) regulations (43 CFR Part 46) codify portions of Chapters 1–6 of Part 516 of the Departmental Manual and Chapter 10 of the Department Manual, which are specific to the BIA’s management of the NEPA process. In addition, the DOI, through the Office of Environmental Policy and Compliance, continuously updates a series of environmental statements, reviews, and compliance memoranda, and the 59 IAM further defines NEPA policy, authority, and responsibility of BIA staff.

## ***1.5. Scoping and Issues***

### **1.5.1. Internal Scoping**

Scoping issues identified through coordination with the BIA team included cultural resources, water resources, resource use patterns, and other values.

### **1.5.2. External Scoping**

The proposed development is part of the JAN’s renewable energy goals that seek to “obtain self-sufficiency with respect to the transmission and distribution of electricity to the Nation” (Ordinance 2011-O-582-1, which established the JANPA). As such, the JAN has established a 5,600-acre special use area for the siting of solar generation and related solar storage projects (Resolution No. 2019-R-246-10). This resolution also terminated any grazing permits within the boundaries of the proposed special use area and notified affected permittees. The Proposed Action was discussed and subsequently authorized service agreements in meetings open to the public (August 21, 2019, Resolution No. 2019-R-189-08; August 23, 2019, Resolution No. 2019-R189-08).

### **1.5.3. Issues**

A list of issues to analyze in this Environmental Assessment (EA) was developed according to guidelines in the BIA NEPA Guidebook (BIA 2012). Key issues identified during scoping included potential impacts to:

- cultural resources, Traditional Cultural Properties, and archaeological sites within the proposed project area;
- surface flows and water resources across the proposed project area;
- resource use patterns by the fencing and removal of 1,428 acres from Tribal access;
- possible introduction of hazardous materials;
- visual resources from the addition of a solar array and transmission line to the landscape;
- local socioeconomics; and
- ecosystems and habitats from vegetation removal.

These issues are described in further detail in Sections 3.4–3.10.

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## 2. ALTERNATIVES

### ***2.1. Alternative A – Proposed Action***

The Proposed Action would include the construction of a 1,500-acre PV solar electrical power generation facility that will connect with the JANPA’s existing 345/115-kV switchyard. The solar facility will be constructed within a JAN-established 5,600-acre special use area for solar energy generation and related solar energy storage projects. A detailed description of the solar facilities is provided in the sections below (see Attachment 1. Site Plan).

#### **2.1.1. Solar Facility**

##### **2.1.1.1. Solar Panels and Arrays**

The project would involve the installation of approximately 308,000 PV modules mounted on a single-axis horizontal tracker system. The individual modules measure approximately 6.6 feet tall by 3.3 feet wide. The solar facility would generate up to 190 MW of AC power and storage. The principal materials used in the PV panels and mounting systems are glass, steel, and various semiconductor metals. The specific type of solar panels to be used would be determined as part of the final project design.

The mounting system for the PV modules would consist of steel posts driven into the ground. It is estimated that posts for single-axis tracking structures would need to be driven up to 12 feet into the ground. Tilt-brackets would be bolted onto the steel posts, and tracker structures would be bolted onto the brackets. The PV panels would then be mechanically fastened to the table frames or tracker structures. The PV modules would be mounted horizontally. The arrays would be installed in rows oriented in a north–south direction. Panels would be powered by drive motors to track the east–west path of the sun throughout the course of a day. The maximum height of a module on a horizontal tracker during the course of a day would be approximately 8 feet. The minimum height would be approximately 1.5–2.0 feet above the ground surface.

The assemblies would be organized into arrays, as shown in Attachment 1. The length and width of the arrays may vary depending on technology and array design. The exact placement of the arrays within the proposed project area would be based on topography, hydrology, and geotechnical conditions. The final design would include a 100-foot avoidance buffer around all cultural sites and existing oil and gas wells (see Section 3.4.2).

##### **2.1.1.2. Facility Substation**

The electricity generated from the solar panels (direct current [DC]) would be delivered through cables to an inverter located in the facility substation, where the DC is converted to AC. A transformer would then step up the voltage to 345 kV. The substation yard and associated equipment would be developed within an approximately 2-acre area in the eastern corner of the solar facility site. The main station area is anticipated to be approximately 200 by 300 feet. The 345-kV substation would collect and consolidate the medium voltage cables of the PV collector system. Electrical transformers, switchgear, and related substation facilities would be designed and constructed to transform the power from the project to the 345-kV needed to enter the JANPA system at the JANPA 345-kV switchyard. Components of the substation would include power and auxiliary transformers with foundations, a prefabricated control building to enclose the protection and control equipment, a metering stand, capacitor bank(s), and circuit breakers and disconnect switches. The substation area would be graded

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and compacted to an approximately level grade. Concrete pads would be constructed for substation equipment, and the remaining area would be graveled.

#### **2.1.1.3. Operations and Maintenance Building**

An operations and maintenance (O&M) building would be constructed at the project site with on-site parking. The building would be designed for project security and parts storage and would be approximately 50 by 100 feet in total area. It would be constructed on a concrete foundation.

#### **2.1.1.4. SCADA and Telecommunications Facilities**

The facility would be designed with a supervisory control and data acquisition (SCADA) system to allow remote monitoring of facility operation. The fiber-optic or other cabling required for the monitoring system typically would be installed in buried conduit within the access road leading to a SCADA system cabinet centrally located within the project site or a SCADA system cabinet within the O&M building. The SCADA facilities associated with the project would be located within the substation area and O&M building.

#### **2.1.1.5. Battery Energy Storage System**

The project would include an AC-coupled battery or similar storage system capable of storing up to 190 MW of power. If provided, the storage system would be housed in electrical enclosures and buried electrical cable. The battery system would be concentrated in the eastern portion of the project site, adjacent to the substation. The anticipated size of the Battery Energy Storage System (BESS) facility area is 3 acres, or about a 300-by-300-foot area. The project could use any commercially available battery technology, including but not limited to lithium ion, flow, lead acid, sodium sulfur, and sodium or nickel hydride.

#### **2.1.1.6. Meteorological Data Collection System**

The project would include a meteorological (MET) data collection system with up to five MET stations throughout the solar facility. Each MET station would have multiple weather sensors: a pyranometer for measuring solar irradiance, a thermometer, a barometric pressure sensor, and wind sensors to measure wind speed and direction. The MET stations would be approximately 10 feet tall and would be colocated with PV inverters, and thus not require separate infrastructure.

#### **2.1.1.7. Solar Facility Access Roads**

Internal access roads would be constructed at selected locations within the proposed project area. These roads would be required to facilitate the transport of project equipment and materials from the staging areas to construction work areas. Internal access roads would be constructed and stabilized with gravel or compacted and stabilized with native soil material. Roads would be approximately 16 feet in width. Final location of roads within the site would be identified in the final design, but it is estimated the site would include up to 10 miles of internal roads. At 16 feet wide, this would be approximately 20 acres of ground disturbance. These internal roads would continue to be used to access the facilities during project O&M. External road access to the facility would be primarily via road J 36, which has already been improved for access to the neighboring solar facility. The project would maintain this road to the standard set by the previous installation to support construction traffic.

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#### **2.1.1.8. Security, Fencing, and Lighting**

New roads or modifications to existing roads to access the solar facility would not be required, and lighting would be minimal. It is anticipated that there will be one primary access point from road J 36 to the solar facility. The solar facility would be accessed through a locked gate.

The solar facility would be enclosed with fencing that meets National Electric and Safety Code requirements for protective arrangements in electric supply stations. The boundary of the project development areas would be secured by up to 8-foot-high chain-link perimeter fences. At a maximum, the entire 1,500-acre proposed project area boundary would be fenced; at a minimum, the solar array, substation, and battery areas would be fenced, pending final design. The ultimate fencing configuration would be determined as the final design of the solar facility proceeds. Access to existing underground oil and gas facilities would be maintained regardless of the final fencing configuration. The Applicant would coordinate closely with the existing lease holders to ensure access is maintained.

Lighting would be restricted to areas required for safety, security, and operation, such as the O&M building and substation area. The substation area would include safety lighting to illuminate the high-voltage equipment. Major installed equipment and facilities such as inverters, battery units, and the O&M building may include safety lighting as well. No general illumination for roads, array areas, fencing, etc. is planned. The level and intensity of lighting during operations would be the minimum needed. Portable lighting may be used occasionally and temporarily for maintenance activities during operations, such as emergency work that must occur on panels at night (Table 1).

#### **2.1.2. Construction**

The first construction activities would be geotechnical investigations, fencing of the construction area, and surveying and staking of facility locations. Geotechnical investigations would be conducted to gather information on the physical properties of the soil and rock for use in the final design of the project and to support the project's grading plan and stormwater management plan. Staked facility locations would include internal roads, existing oil and gas wells, buried electrical or gas lines, PV arrays, construction area boundaries, temporary work areas, areas to be graded or excavated, foundation structures, and areas designated for the protection of cultural resources. All temporary construction and laydown areas would be to be within the 1,500-acre project boundary.

To create a relatively flat and compacted surface for the safe movement of construction workers and equipment, site preparation and the vegetation removal would be required. The anticipated methods for site preparation would be a disk contour grade-and-roll method and vegetation compaction, mowing, or trimming throughout most of the project site. Plant root systems would be left in place, to the maximum extent practicable, to provide soil stability. Topsoil removed through grading in these areas would be used for balancing cut and fills and restoring existing contours. Grading would occur only in the areas where the elevation would require modification to accommodate tracker tolerances, site drainage, roads, and foundations.



**Table 1. Ground-Disturbance Summary**

| Site Feature             | Approximate Acreage | Temporary or Permanent |
|--------------------------|---------------------|------------------------|
| interior roads           | 20                  | permanent <sup>a</sup> |
| substation area          | 2                   | permanent <sup>a</sup> |
| battery area             | 3                   | permanent <sup>a</sup> |
| array area               | 960                 | temporary <sup>b</sup> |
| transmission line tie-in | 35                  | temporary <sup>b</sup> |
| laydown areas            | 40                  | temporary <sup>b</sup> |
| undisturbed              | 475                 | N/A                    |
| Total Site               | 1,500               | N/A                    |

<sup>a</sup> Ground disturbance resulting from grading to establish solid roadbeds or foundational areas.

<sup>b</sup> Existing vegetation would be mowed or trimmed as opposed to graded during construction. While the arrays themselves are permanent, the ground underneath them would remain largely undisturbed on a permanent basis, and short-stature vegetation would be permitted to recover.

The structures supporting the PV module arrays would consist of steel piles driven into the soil. The piles typically are spaced 10 feet apart. Piles would usually be installed approximately 4–6 feet above grade. Following pile installation, the associated motors, torque tubes, and drivelines (if applicable) would be placed and secured. Some designs allow for PV panels to be secured directly to the torque tubes using appropriate panel clamps. For some single-axis tracking systems, a galvanized metal racking system, which secures the PV panels to the installed foundations, would then be field-assembled and attached.

Direct current (DC) lines would be installed in conduits. The lines would be collected and combined from the arrays and routed to the inverters to be converted to AC. Within the arrays, this wiring would typically be hung from the racking equipment. Final sections would be connected to the inverters via an underground stub. Trenches for the collector lines would be run from the inverters to the collector substation.

The proposed BESS area would be cleared and graded. Site preparation would also include construction of drainage components to capture and direct stormwater flow around the BESS facility. Once the concrete foundations are in place for the BESS, the batteries, inverters, and other electrical equipment would be mounted and installed.

Flatbed trailers and trucks would be used to transport construction equipment and construction materials to the site. Crews would utilize existing roads; new roads or modifications to existing roads to access the project would not be required. Project components would be assembled on-site. Separate equipment staging areas outside the site boundaries would not be required. Traffic from construction activities would be temporary and could occur along existing roadways as workers and materials are transported to and from the project site.

Because the Proposed Action would involve more than 1 acre of ground disturbance, the New Mexico Environment Department would require coverage under the New Mexico Pollutant Discharge Elimination System general permit for stormwater discharges associated with construction activity. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared to meet the conditions of the

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permit and would be used as an erosion and sediment control (ESC) plan. The plan would provide the general contractor with the framework for reducing soil erosion and minimizing the potential impact of stormwater pollution from common activities and sources at construction sites. Specifically, the SWPPP would detail the structural and nonstructural best management practices (BMPs) to control erosion associated with surface stormwater discharges during construction, decrease the volume and rate of stormwater runoff, and increase pollution attenuation after construction.

JANPA plans to extend an existing 8-mile 345-kV transmission line by approximately 1 mile, which would connect this project into the existing solar collection area. The improvements are anticipated to use similar steel monopole and H-frame structures to the existing line and follow the existing J 36 alignment. All ROWs and physical equipment associated with these improvements would be designed, procured, installed, owned, and operated by the JANPA. For purposes of this EA, the transmission line extension will be incorporated into the Proposed Action. A supplemental cultural resources survey will be conducted to note any potential resources within this area for documentation and potential avoidance.

Project construction is anticipated to begin in 2024 and is estimated to last approximately 10–12 months. Construction is expected to typically occur from 7:00 a.m. to 5:00 p.m., Monday through Friday. However, due to weather conditions, work in the early morning, evening, or nights and on weekends during certain construction phases may be necessary.

### **2.1.3. Operations and Maintenance**

The solar facility's O&M requirements would be minimal because the facility would operate passively. Primary maintenance activities would include solar panel inspections, periodic solar panel washing, and electrical system checks. The small amount of water required for annual washing would be trucked to the site. During O&M, vegetation throughout the solar fields would be managed and trimmed as needed to facilitate maintenance activities, reduce fire risk, and allow the solar panel tracking system to operate properly.

### **2.1.4. Decommissioning**

Decommissioning would include removal of all aboveground and near-ground facilities, including the PV arrays and supporting electrical and facility systems. The PV arrays, power connection systems, cabinets, and substation would be de-energized and removed in accordance with all Federal, State, and local regulatory requirements. All internal roads would be reclaimed. Removed materials and debris would be broken down on-site and safely transported off-site. All removed equipment would be recycled or disposed of in compliance with applicable laws. Most of the project facilities would be composed of materials that can be recycled, including glass, semiconductor material, aluminum, steel, and wiring. PV modules and other structures used during construction and operation of the project are generally not hazardous and are not subject to Federal or State hazardous material management regulations. After removal of all equipment, the site would be restored to pre-construction conditions.

### **2.1.5. Reclamation and Restoration**

After removal of all equipment, reclamation and restoration activities would be implemented to restore the land to pre-construction conditions and to minimize the potential for erosion. All soil and vegetation would be restored with native vegetation similar to plants in the surrounding landscape. The disturbed soil would be stabilized using erosion-control BMPs, and topsoil, brush, rocks, and natural debris would be distributed so that the site would visually blend in with the surrounding

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landscape and to facilitate revegetation. Compacted soils would be de-compacted. Restoration would include a combination of natural regeneration and mechanical reseeding. Soil disturbance by mechanical means would be minimized to prevent invasions of non-native plant species and to maintain soil fertility.

#### **2.1.6. Design Features and Mitigation Measures**

The following relevant project design features (DF) and mitigation measures (MM) have been identified to minimize or eliminate potential impacts to resources. All design features may be included as stipulations or conditions of approval in the BIA lease issued to the Applicant.

##### **2.1.6.1. General**

- Shallow Basket Energy, LLC, and its contractors shall adhere to all provisions outlined in the JAN Environmental Protection Code (JAN Tribal Code Title 14). (DF)

##### **2.1.6.2. Paleontological Resources**

- If fossil remains are encountered by Shallow Basket Energy, LLC, and its contractors, appropriate agencies would be contacted, and all work within 100 feet of the any identified find(s) would be temporarily halted or diverted until a qualified paleontologist examined the discovery. (DF)

##### **2.1.6.3. Cultural Resources**

- Cultural resource sites identified within the proposed project area will be flagged for avoidance by a qualified archaeologist prior to ground disturbance. (MM)
- Installation of avoidance fencing will be completed by construction personnel prior to any ground disturbance. (MM)
- Avoidance fencing will be periodically inspected and repaired as necessary throughout construction. (MM)
- Design plans will specifically include a 100-foot buffer around 17 identified archaeological avoidance areas within the proposed project area. No permanent facilities will be placed within the avoidance areas. (MM)
- If construction activities occur within 100 feet of a known archaeological site, a qualified archaeological monitor shall be present. (MM)
- All employees, contractors, and subcontractors of the project will be informed by the Applicant that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment; that it is illegal to collect, damage, or disturb cultural resources; and that such activities are punishable by criminal and administrative penalties under the provisions of the Archaeological Resources Protection Act (ARPA) (Public Law 96-95; 16 USC 470aa-mm). (DF)
- With regard to human remains, regulations (43 CFR 10) governing application of NAGPRA state that any person who inadvertently encounters human remains, funerary objects, sacred objects, or objects of cultural patrimony on Federal or Tribal lands must immediately telephone the responsible agency or Tribal official to notify them of the discovery and subsequently follow up this call with a written confirmation. (DF)
- In the event of a discovery during construction, Shallow Basket Energy, LLC, and its contractors will stop all construction activities in the immediate vicinity of the any unforeseen discovery and immediately notify the JAN Tribal monitor, if present, or the JAN cultural

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resources manager. The cultural resources manager will then evaluate or cause the site to be evaluated immediately. Should a discovery be evaluated as significant (e.g., Eligible for the National Register of Historic Places [NRHP] or protected by NAGPRA or ARPA), it will be protected in place until mitigating measures can be developed and implemented according to guidelines set by the JAN cultural resources manager. (DF)

#### **2.1.6.4. Hazardous Materials**

- Per the December 20, 2022, Phase I Environmental Site Assessment, one active, one canceled, and three plugged oil and gas wells were identified in the proposed project area (Tetra Tech 2022) (Attachment 4). Although these wells are not considered recognized environmental contaminants (RECs), it is recommended that they be avoided during project design and construction. (MM)
- If suspected hazardous materials are encountered during construction or a spill occurs due to an unforeseen circumstance, such as an equipment malfunction, Shallow Basket Energy, LLC, and its contractors would notify the JAN Public Works Department and other relevant agencies. (DF)
- Construction practices will adhere to the JAN Solid Waste Management Ordinance (JAN Tribal Code Title 14 Chapter 4). (DF)
- Construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Approved enclosed refuse containers will be used throughout the proposed project area. Refuse and trash will be removed from the sites and disposed of in an approved manner. Oils or chemicals will be hauled to a disposal facility authorized to accept such materials. Open burning of construction trash will not take place on the project site. (DF)

#### **2.1.6.5. Erosion Control and Runoff**

- To ensure that surface water quality is protected during the proposed construction, Shallow Basket Energy, LLC, and its contractors would comply with the NPDES Construction General Permit (CGP) for stormwater discharges associated with construction and land disturbance. Compliance with the CGP will require development and implementation of a SWPPP that will be in effect during all construction activities for the solar site and all associated facilities. (DF)
- The project will work to align with EPA/NPDES BMPs for stormwater, erosion, and sediment control. This includes development of applicable ESCs, as well as routine inspections during the construction period, inspections before and after major stormwater events, and corrective actions for any impacted ESCs. (DF)
- Inspections will assess any graded areas, ESCs implemented at the site, material and equipment storage, and any additional areas outlined in the SWPPP. (DF)
- Additionally, the project will work to align with EPA guidelines for construction waste management, including waste collection, spill cleanup, and designated storage areas outside of stormwater flow paths for project equipment and waste. (DF)
- Shallow Basket Energy, LLC, and its contractors will adhere to the JAN Water Code Ordinance (JAN Tribal Code Title 21). (DF)

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#### **2.1.6.6. Air Quality**

- Fugitive dust will be limited during construction by dust-control measures, such as watering disturbed areas by a spray bar–equipped water truck, as necessary, to comply with State requirements, local ordinances, and other jurisdictional agencies’ requirements. Post-construction stabilization will adhere to the BMPs included in the project’s NPDES permit. (DF)

#### **2.1.6.7. Vegetation**

- Construction practices will adhere to the JAN Weed Control and Pesticide Regulation Ordinance (JAN Code Title 14 Chapter 2). (DF)
- All construction equipment will be washed prior to entering the construction area. (MM)
- All disturbed areas will be revegetated with low-stature native plants following construction. (MM)

#### **2.1.6.8. Living Resources**

- To minimize potential impacts to big game species, the perimeter fence around the solar site will be constructed using an 8-foot-tall game fence without a razor wire component that will serve to exclude big game species while preventing impacts through entanglement. (DF)

#### **2.1.6.9. Migratory Birds**

- If construction activities occur during the migratory bird breeding season, generally considered to be April 15 to August 31 for the area, a qualified biologist would be employed to complete a preconstruction survey for nesting birds. If the initial ground clearing is completed outside of breeding season, a preconstruction survey is not warranted. (MM)

### ***2.2. Alternative B – No-Action Alternative***

Under the No-Action Alternative, the BIA must consider an alternative that assesses the impacts that would occur if the project were not constructed. The No Action Alternative assumes that the lease agreements would be denied, the project would not be constructed as proposed, and the Applicant would need to explore alternative avenues to producing renewable energy. Renewable energy would not be generated, and the No-Action Alternative would not meet the purpose and need for the proposed project.

Information provided for the No-Action Alternative serves as the baseline for the analysis of impacts associated with the other alternatives.

### ***2.3. Alternatives Analyzed in Detail***

Only Alternative A, the Proposed Action, and Alternative B, the No-Action Alternative, will be addressed in this EA.

### ***2.4. Alternatives Analyzed but Dismissed from Consideration***

The project is located within a 5,600-acre special use area that was designated by the JAN as part of its regional planning and self-sufficiency goals related to transmission and electric distribution. Micro-siting within this larger area was conducted, and proximity to existing infrastructure, transmission interconnection points, and access was considered. Alternative locations were dismissed by the



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Applicant due to economic considerations of constructing the transmission line connection into an existing JAN substation.

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### 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

#### 3.1. *Introduction*

This section describes the existing conditions relevant to the issues identified in Section 1.5.3 and discloses the potential impacts of the Proposed Action and the No-Action Alternative. Per the updated 2022 NEPA Implementing Regulations (40 CFR Parts 1500–1508), specifically 40 CFR 1508.1(g), effects (impacts) are defined as changes to the human environment from the Proposed Action or alternatives that are reasonably foreseeable and include the following:

- direct effects, which are caused by the action and occur at the same time and place;
- indirect effects, which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable; and
- cumulative effects, which are 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.

#### 3.2. *Cumulative Actions*

For the purposes of this cumulative impact analysis, past, present, and reasonably foreseeable projects were evaluated that may, in combination with the current project, result in cumulative effects. Past uses in the proposed project area primarily include livestock grazing, electric infrastructure, and oil and gas development. The JANPA built a substation and over 60 miles of transmission line in the proposed project area in 2014. Present uses include oil and gas development, transmission infrastructure, and solar generation. There are several oil and gas pipelines and wells located in the proposed project area, and a 900-acre solar facility located east of the project is currently under construction. The project is located within a 5,600-acre special use area that was designated by the JAN as part of its regional planning and self-sufficiency goals related to transmission and electric distribution. Although there are currently no known plans under consideration, it is possible that future renewable energy and electric infrastructure projects would be built in the proposed project area.

It is unlikely that the reasonably foreseeable projects and management activities in the cumulative effects analysis areas would be built at the same time as the Proposed Action; therefore, there would be no measurable contribution of the short-term impacts to a given resource's cumulative impacts, and no cumulative short-term effects analysis for the respective resource has been completed. Additionally, if the results of the analysis of direct or indirect impacts were considered to be none or negligible as a result of the Proposed Action and/or No-Action Alternative, there would be no measurable contribution to a cumulative effect; therefore, no cumulative effects analysis for the respective resource has been completed. Additionally, analysis that resulted in a beneficial impact to the resource has also not been carried forward.

Based on the analysis of direct and indirect impacts provided in previous resource evaluation sections, neither the Proposed Action nor No-Action Alternative would have long-term, minor, moderate, or major direct or indirect effects to topography; soils; air quality; threatened or endangered species, climate change and GHG emissions; cultural resources; environmental justice; livestock grazing, crops, prime and unique farmland; agriculture; floodplains; forest resources; geology, minerals, or paleontological resources; mineral extractions; wilderness, Indian Trust Assets; land ownership and

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land use; transportation network; migratory birds; Native American religious concerns; noise and light; recreation; socioeconomic conditions; hazardous materials and wastes; wetlands and riparian resources; and Wild and Scenic Rivers within the project area. There would be no measurable contribution to the resource's respective cumulative impacts; therefore, there is no cumulative effects analysis for these resources.

### ***3.3. Resources Dismissed from Further Evaluation***

A resource was dismissed from detailed analysis if it was not present in the proposed project area, if impacts would be negligible to minor, or if impacts would be mitigated below significance through implementing project design features. The dismissed resources and the rationale for not carrying them forward in this EA are in the following sections. Supporting documentation for these statements is in the project record.

#### **3.3.1. Land Resources**

Refer to Attachments 2 (*Biological Assessment for the Proposed Affordable Solar Jicarilla Solar Energy Center 1 Project on the Jicarilla Apache Nation Lands, Rio Arriba County, New Mexico*) and 5 (*Jicarilla Solar Energy Center 1 Approved Jurisdictional Determination Request*) for a complete description of the land resources, soils, and geology found across the proposed project area.

##### **3.3.1.1. Topography**

The proposed project area is in a relatively flat area that minimizes the need for grading and substantial topographical changes. Drainage features in the proposed project area consist of vegetated rills or swales within uplands that flow only in response to seasonal precipitation or snowmelt. Ephemeral drainages in the proposed project area lack permanent or intermittent surface water, wetlands, obligate or facultative hydrophytic vegetation, moss, and algae.

Development of the solar facilities would not cause changes in topography and would not affect geologic features or conditions. Light grading or vegetation compaction within the project site would be required to allow for safe movement of construction equipment and vehicles and installation of the solar panels. Grading would be minimized to the maximum extent practicable and only for the placement and construction of permanent features such as buildings and roads. Impacts to topography would be short term and only last for the duration of construction. After construction is completed, any disturbed areas would be restored to preconstruction conditions, including seeding for low-stature native plants. Vegetation should be reestablished within 3–5 years. The Proposed Action would not result in large areas with impervious or paved surfaces. The proposed project would result in negligible impacts to topography.

##### **3.3.1.2. Soils**

Three soil types occur within the proposed project area, Doakum very fine sandy loam, Doakum-Betonne fine sandy loams, and Lindrith-Royosa complex (NRCS 2023). All soil types consist of very fine sandy loam and sandy clay loam deposits that are well drained. These soils are not hydric and do not flood or pond surface water. The potential for soil erosion during construction would be minimized through the implementation of design features and BMPs. The proposed project would result in negligible impacts to soils.

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#### **3.3.1.3. Geology, Minerals, and Paleontological Resources**

The proposed project area is located within the east central portion of the San Juan Basin that occurs on the Colorado Plateau, straddling the Four Corners area, but mainly in northwestern New Mexico. Primary mineral resources on the JAN and project area include oil and gas, and there are several oil and gas wells and pipelines located within the proposed project area. There are no known significant paleontological resources located within the proposed project area.

Final design features would ensure that if fossil remains are encountered by construction personnel, appropriate agencies would be contacted, and all work within 100 feet of the find would be temporarily halted or diverted until a qualified paleontologist examines the discovery to advise on the significance of a potential find. The proposed project would result in negligible to no impacts to geology, minerals, or paleontological resources.

#### **3.3.2. Air Quality**

The EPA has the primary responsibility for regulating air quality, including six nationally regulated ambient air pollutants (criteria pollutants). These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb). Rio Arriba County and the proposed project area are currently in attainment for all six criteria pollutants (EPA 2022). Emissions and fugitive dust generated during construction of the project would be temporary and not substantial enough to cause a violation of the existing ambient air quality standards or cause a significant impact on air quality. Sensitive receptors are homesites, schools, and hospitals where children, the elderly, the acutely or chronically ill, and others who are sensitive to air pollution are at a higher risk of developing negative health symptoms if exposed to air pollution. There are no residences or sensitive receptors located in the proposed project area. Pollutant concentrations generated during construction and operation would be temporary, lasting only the duration of construction and would not be considered significant. The project would comply with the guidelines outlined in the JAN Environmental Protection Code (JAN 2009). Project design features would be implemented to reduce any impacts on air quality. The proposed project would result in negligible impacts to air quality.

#### **3.3.3. Living Resources**

A site visit and field survey was conducted in June 2022 to record the on-site living resources of the proposed project area. A report, *Biological Assessment for the Proposed Affordable Solar Jicarilla Solar Energy Center 1 Project on the Jicarilla Apache Nation Lands, Rio Arriba County, New Mexico*, was prepared and provided to the JAN Game and Fish Department (Smith 2022) (see Attachment 2).

##### **3.3.3.1. Wildlife – Terrestrial, Aquatic, Threatened, or Endangered**

The report concluded that the proposed project area does not support suitable or occupied habitat for any species protected under the ESA. The proposed project area supports habitat for game species, such as mule deer and elk; these resources are analyzed in Section 3.6. Migratory bird species occur in the proposed project area. While no nests were observed during the surveys, the potential for undiscovered nests in the proposed project area exists, or new nests could be built prior to construction. Planning construction activities outside of the spring-to-mid-summer migratory bird breeding season would reduce impacts to negligible. Design features have been incorporated into the Proposed Action to minimize or otherwise eliminate potential impacts to migratory birds that may be caused by the proposed solar facility (Section 2.1.6.9).

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#### **3.3.3.2. Vegetation – Aquatic, Threatened, or Endangered**

The proposed project area does not contain any sensitive plant species and does not support any aquatic or riparian systems and inhabitants.

#### **3.3.3.3. Agriculture – Livestock, Crops, Prime or Unique Farmland**

There are no crops or farming operations located in the proposed project area. The Natural Resources Conservation Service identifies categories of farmlands of national and statewide importance in a region based on soil types and irrigation status. The proposed project area is considered not prime, unique, or farmland of local and/or State importance (NRCS 2023).

#### **3.3.4. Other Values**

The project is in a remote and undeveloped area of the JAN.

##### **3.3.4.1. Wilderness**

There are no wilderness areas or designated conservation sites within the proposed project area.

##### **3.3.4.2. Noise and Light**

Project construction and O&M would not produce light that would negatively affect the surrounding area. Construction would occur during normal daylight hours; typical O&M activities would not require external nighttime lighting. Any external lighting associated with the buildings would be directed downward and away from natural areas. Emergency repairs may necessitate nighttime lighting, but these instances would be of short duration and infrequent. There are no residents within a 5-mile radius of the proposed project area. Construction would not occur at night or at dusk when many wildlife species are active. An increase in noise and/or light from construction may have a short-term negligible impact on wildlife in the area.

##### **3.3.4.3. Public Health and Safety**

A Phase I Environmental Site Assessment was conducted on the site in December 2022 (Tetra Tech 2022; see Attachment 4). According to the report, there are no Resource Conservation and Recovery Act Subtitle C, D, or I sites; Comprehensive Environmental Response, Compensation, and Liability Act sites; or Toxic Substances Control Act sites in the vicinity of the proposed project area. Construction and operation of the project would comply with all State and Federal regulations, which would ensure safe installation and O&M of all project facilities.

##### **3.3.4.4. Climate Change/Greenhouse Gases**

The analysis of potential impacts to climate change associated with the construction, O&M, and decommissioning of a solar facility on the JAN determined that there would be short-term, minor increases in GHGs from construction and decommissioning, with exhaust from construction equipment and vehicles increasing ambient concentrations of GHGs. Manufacture of PV cells and modules is the most GHG-intensive individual component of the project, resulting in approximately 61.89 metric tons/year of carbon dioxide equivalent (tCO<sub>2</sub>e)/MW or 10,397.5 tCO<sub>2</sub>e for the entire project. On an annualized basis, this is 297 tCO<sub>2</sub>e per annum for the estimated lifetime of the project, which is far below the 25,000 tCO<sub>2</sub>e threshold (CEQ 2010). It is expected that construction and decommissioning activities would not result in more than 15,000 tCO<sub>2</sub>e. Because GHG emissions for the construction and decommissioning are anticipated to be less than the 25,000 tCO<sub>2</sub>e reporting minimum, no additional assessment is required (CEQ 2010).



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O&M would include combustion emissions from worker commutes, delivery trips, and construction equipment, though this is not expected to be a net increase in comparison to existing conditions. The project emits no GHG emissions during normal operations. Operational GHG emissions from the project are limited to personal and delivery vehicle travel to the site over the life of the project. Fifty miles of personal vehicle travel per day would result in less than 4 tCO<sub>2</sub>e per annum over the life of the project based on an estimated 187g CO<sub>2</sub>/mile. However, long-term generation of renewable electricity through solar power would have long-term benefits by reducing GHGs associated with energy generation. Therefore, the Proposed Action would not result in substantial GHG emissions and would help achieve Federal and State goals to reduce GHG emission levels.

The Proposed Action would have negligible, short-term, direct and indirect, adverse impacts on climate change resulting from construction, O&M, and decommissioning. The Proposed Action would have negligible, long-term, direct and indirect, beneficial impacts on climate change from the reduction of primary contributors to GHG emissions offset by the generation of carbon neutral electricity. Therefore, this resource topic has been eliminated from further analysis in this EA.

#### **3.3.4.5. Indian Trust Assets**

Indian Trust Assets are legal interests in property held in trust by the U.S. for Indian Tribes or individuals. Examples of objects that may be trust assets are lands, minerals, hunting and fishing rights, trees and woodlands, and water rights. The project would not interfere with or impact any Indian Trust Assets. Therefore, there would be no impacts.

#### **3.3.5. Environmental Justice**

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” issued in 1994, directs Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations. The EPA describes environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from the execution of Federal, State, local and Tribal programs and policies. In the context of environmental justice, an adverse effect is a significant individual or cumulative human health or environmental effect (e.g., the displacement of a household structure or business, disruptions to transit access, excessive dust in areas where people are likely to work or recreate). A disproportionately high and adverse effect on minority and low-income populations is an adverse effect that:

- is predominately borne by a minority population and/or a low-income population; or
- would be suffered by the minority populations and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the nonminority population and/or non-low-income population.

For this environmental justice evaluation, specific demographic characteristics were collected for those populations that could potentially be directly or indirectly affected by the project. From U.S. Census Bureau (2021a) maps, it was determined that the Proposed Action is located in Block Group (BG) 2 of Census Tract (CT) 9410. This BG encompasses 2,020.5 square miles and has a population of 2,340 people. Data from the 2021 ACS 5-Year Estimate indicate that racial minorities reside in BG2, CT9410

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(Table 2). Of the population, 49% reported as Native American or Alaskan Native and 35% reported as Hispanic or Latino.

Although there are protected populations within the CT that encompasses the proposed project area, there are none that reside within 5 miles of the Proposed Action. Construction, O&M, and decommissioning would not have disproportionately high and adverse human health and environmental effects on protected populations because they do not reside in the area. Refer to Section 3.9 for additional information on socioeconomic impacts the Proposed Action may have on JAN Tribal members.

**Table 2. 2021 American Community Survey 5-Year Estimate: Racial and Ethnic Demographics**

| Demographics                                     | Population No. | Percentage of Population |
|--|----------------|--------------------------|
| White alone                                      | 206            | 9%                       |
| Black or African American alone                  | 54             | 2%                       |
| American Indian and Alaska Native alone          | 1,154          | 49%                      |
| Asian alone                                      | 106            | 5%                       |
| Native Hawaiian and Other Pacific Islander alone | 0              | 0%                       |
| some other race alone                            | 0              | 0%                       |
| two or more races                                | 0              | 0%                       |
| Hispanic or Latino                               | 820            | 35%                      |
| Total Population                                 | 2,340          |                          |

### **3.3.6. Native American Religious Concerns**

No Native American religious concerns were identified in or near the project area that would be impacted by the Proposed Action. Since no sensitive Native American religious concerns would be adversely impacted, no measures to minimize or avoid impacts are required. Through coordination and consultation, one Traditional Cultural property (TCP) was identified, although no specific concerns have been raised regarding the TCP or other religious issues. Therefore, this resource topic has been eliminated from further analysis in this EA.

## **3.4. Cultural Resources**

### **3.4.1. Affected Environment**

Reviews of cultural resource records were completed utilizing the New Mexico Cultural Resources Information System online database and map server, and by reviewing documentation maintained at the Archaeological Records Management Section and the New Mexico State Historic Preservation Division. A total of one previously recorded archaeological site and 27 previous survey projects were listed within 0.6 miles of the project survey area.

A cultural resources survey of the proposed project area was conducted in June, July, August, and September 2022 to determine whether any cultural resources would be impacted by the implementation of the Proposed Action (Rude and Shultz 2022). The Applicant has contracted for

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cultural survey of the transmission line route to be completed in conjunction with public comment posting. The results of this survey will be reported as an addendum to the existing survey performed as part of this report. Any identified cultural resources would be excluded from the disturbed area as in the initial survey, with the same 100-foot buffer. The survey and report will be completed prior to finalization of this EA and the issuance of a Finding of No Significant Impact.

Archaeologists surveyed the solar field area of potential effects by walking parallel transects spaced no more than 50 feet apart. The significance of all cultural findings recorded during the current survey was assessed, and recommendations were made as to the eligibility of each property for inclusion in the NRHP. A full description of the survey and cultural resources identified are included in the project record.

In total, 29 archaeological sites and 174 isolated occurrences were encountered and fully documented during the Class III cultural resources survey. The isolated occurrences did not retain aspects of integrity necessary to convey their significance and were not further considered. Out of the archaeological sites, 16 were recommended Eligible for listing in the NRHP, one site would require subsurface testing to fully evaluate, and 12 sites were recommended Not Eligible for NRHP listing. One of the sites recorded is also considered a TCP. A TCP is a property that is Eligible for inclusion in the NRHP based on its associations with the cultural practices, traditions, or beliefs of a living community. TCPs are rooted in a traditional community's history and are important in maintaining the continuing cultural identity of the community. For Native Americans, a TCP may represent a gathering location where traditional religious ceremonies were held or a location where medicinal plants were gathered, among other examples.

### **3.4.2. Impacts of Alternative A – Proposed Action**

Direct impacts to archaeological sites include actions such as alterations to the physical integrity of a cultural site. If a cultural site is significant for reasons other than the scientific information it has the potential to provide, direct impacts may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site.

The cultural resources survey report recommended that the 16 sites recorded as Eligible and the one recorded as unevaluated be preserved in place and avoided during construction and O&M of the solar facility. Further, the report recommended that if construction activities are planned to occur within 100 feet of these sites, activities should be monitored by a qualified archaeologist.

During the project's design phase, the Applicant revised the design to create avoidance areas that buffer cultural and TCP sites by 100 feet. The avoidance areas include 17 sites within the proposed project area. No permanent infrastructure would be placed within these avoidance areas, and project plans do not require work within avoidance buffers. Depending on the results of the supplemental cultural resources survey for the tie-line, similar avoidance and mitigation measures would be recommended. However, if any construction activities are planned within the 100-foot buffer, a qualified cultural monitor would be present, and all construction personnel would be informed that cultural sites are to be avoided.

Although natural processes, such as erosion, have the potential to expose undiscovered cultural resources, the proposed project area would be fenced following construction, and activities on the site would be limited to O&M of the solar array and oil and gas facilities currently present and operating

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on-site. Because the sites would be accessible to very few individuals, it is not anticipated that there is a high risk of long-term disturbance or a subsequent loss of cultural resources, including TCPs, during the life of the project.

With the incorporation of the recommendations identified above, specifically the avoidance of cultural resources, and included in the project design features, a finding of “no adverse effect to historic properties” related to the construction, O&M, and decommissioning of the Proposed Action was made by the BIA on November 29, 2022 (see Attachment 3). This fulfilled the BIA’s agency-to-agency consultation under Section 106 of the NHPA with the JAN Tribal Historic Preservation Office. Therefore, direct or indirect impacts to cultural resources, TCPs, or other traditional religious beliefs, from the construction, O&M, and decommissioning of the Proposed Action and presumably the transmission line (pending supplemental review) would be negligible.

### **3.4.3. Impacts of Alternative B – No-Action Alternative**

The No-Action Alternative would not result in any direct, indirect, or cumulative impacts on cultural resources.

## ***3.5. Surface Flows and Water Resources***

### **3.5.1. Affected Environment**

A jurisdictional delineation was conducted at the project site to evaluate the presence or absence of aquatic resources that are regulated by the U.S. Army Corps of Engineers (USACE) under the CWA, also known as jurisdictional waters of the U.S. The delineation was conducted in September 2022 and consisted of field reconnaissance and review of maps, aerial photographs, and hydrology soil resources reports (see Attachment 5).

Ephemeral drainages within the proposed project area flow only in direct response to significant seasonal precipitation events that occur within the watershed. The proposed project area receives an average annual rainfall of 10.3 inches and snowfall of 16.9 inches, with August having the highest average rainfall of 1.9 inches and December the highest snowfall at 3.7 inches. Seasonal stormwater runoff from the proposed project area flows within small upland rills or swales in a northwesterly direction for 2.5 miles before entering Largo Canyon. Largo Canyon Wash flows northwest for 49.13 miles before joining with the San Juan River near Blanco, New Mexico. The total flow path from the ephemeral drainages within the proposed project area to the San Juan River is 51.63 miles (see Attachment 5).

No wetlands were identified in the proposed project area during the delineation. Additionally, no hydric soils were identified during the wetland delineation surveys or during the associated desktop analysis of soil survey data. All drainage features that occur in the proposed project area consist of vegetated rills or swales within uplands that flow only in response to seasonal precipitation or snowmelt. Vegetation within these drainages consists predominantly of big sagebrush (*Artemisia tridentata*). No ordinary high water mark indicators were observed, and ephemeral drainages in the proposed project area lack permanent or intermittent surface water, wetlands, obligate or facultative hydrophytic vegetation, moss, and algae.

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A review of the Federal Emergency Management Agency's (FEMA) Flood Map Service Center indicates that the proposed project area is not within a floodplain (FEMA Map #35039C2375D, dated 3/15/2012).

### **3.5.2. Impacts of Alternative A – Proposed Action**

Construction and O&M of the project would not result in impacts on surface water features. No permanent or intermittent surface water features; wetland or hydrophytic vegetation, moss, or algae; or hydric soil were identified during the field reconnaissance or from any of the baseline information that was collected in the proposed project area. Since the proposed project area lacks all the indicators of permanent, relatively permanent, or intermittent surface water and only contains features associated upland rills or swales, all aquatic resources within the entire project area are not likely to be considered jurisdictional under the current CWA definition of waters of the U.S. and regulatory regime. An Approved Jurisdictional Determination Request was submitted to the USACE and approved on August 7, 2023, citing no jurisdictional waters were present on the proposed project area (see Attachment 5).

Construction of the project would require the use of heavy equipment and installation of structures and facilities that would disturb native soil, thereby altering drainage patterns and increasing the potential for runoff and erosion. To reduce the potential for runoff and to ensure that surface water quality is protected during construction and operation of the project, a NPDES CGP for stormwater discharges associated with construction and land disturbance would be obtained prior to construction. Compliance with the CGP would require development and implementation of a SWPPP that would be in effect during all construction activities for the development and construction of the solar site and all associated facilities. To control erosion and stormwater runoff, the project would also strictly adhere to the design features listed in Section 2.1.6.5. Specifically, the site would be restored to the extent practical during the operation of the facility, including reseeded with native, low-stature plants. Additionally, the project would adhere to the JAN Water Code Ordinance. Therefore, direct impacts to surface flows and water resources as a result of the construction, O&M, and decommissioning of the Proposed Action and transmission line would be temporary and minor.

### **3.5.3. Impacts of Alternative B – No-Action Alternative**

The No-Action Alternative would not result in any direct, indirect, or cumulative impacts on water resources.

## ***3.6. Resource Use Patterns***

### **3.6.1. Affected Environment**

Resources-use patterns include activities such as hunting, fishing, and gathering; timber harvesting; agriculture; mineral extraction; recreation; transportation networks; and land use plans. The proposed project area does not provide opportunities for fishing or recreation. While the proposed project is in a woodland area (see Section 3.10), the predominant vegetation is sagebrush, which is not a managed timber or woodland species. The area is not used for timber or woodland species harvesting. However, removal of any pinyon pine or juniper trees would require coordination with the JAN Forestry Department in accordance with their forest management plan.

**Hunting and gathering:** The proposed project area supports habitat for game species, including elk (*Cervus* sp.) and mule deer (*Odocoileus hemionus*). These two species are managed as big game species by



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the JAN Game and Fish Department, and the species use the proposed project area for foraging and to migrate between summer and winter ranges. There are no surface waters or fishing opportunities in the proposed project area.

**Agriculture:** The proposed project area is not used for agricultural crops but was available for livestock grazing leases in the past. The JAN recently reclaimed the proposed project area for Tribal purposes as part of its regional planning and renewable energy goals, and the area is no longer available for livestock grazing (JAN Special Use and Solar Energy Complex, Resolution No. 2019-R-246-10).

**Mineral extraction:** There is one canceled oil and gas well, one active oil and gas well, and three plugged oil and gas wells located on the project site. Minimal, unimproved transportation infrastructure is present for accessing oil and gas facilities. Sand, gravel, coal, and limestone minerals are not located in the proposed project area.

**Land use:** The proposed project area is in a special use area specifically designated for solar energy generation and storage projects. There are no commercial, industrial, or residential developments in the proposed project area. There are dispersed oil and gas operations in the proposed project area and within the larger JAN designated special use area. There are no designated recreation areas, facilities, or trails near the proposed project area.

**Transportation networks:** The main road to access the project site is NM 537, which begins at U.S. 550 northwest of Cuba, New Mexico, and extends to U.S. Route 64 south, southwest of Dulce, New Mexico. J 36, a dirt road, provides access north from U.S. 550 to the project site. Several other unnamed dirt roads are in the project vicinity that provide access to existing oil and gas facilities and mining claims. These roadways are in a rural area and do not experience heavy traffic.

### 3.6.2. Impacts of Alternative A – Proposed Action

**Hunting and gathering:** Following construction, the proposed project area would be fenced and would no longer be accessible to big game species, removing up to 1,500 acres of habitat for big game species if the entire area was fenced. The amount of habitat removed for this project would be about 0.17% of the approximately 860,000 acres of available habitat for these species in the JAN. The Proposed Action would have a minor, adverse, direct impact on hunting and gathering as a result of the construction, O&M, and decommissioning. After the term of the WSR lease, the land would be rehabilitated and returned to its natural state, assuming no additional uses are planned for the site.

**Agriculture:** Because there are no active farmland or grazing leases in the proposed project area, no impacts to agriculture are anticipated.

**Mineral extraction:** The project has been designed to avoid oil and gas facilities, and oil and gas lessees would be notified that the project is being planned. Access to existing mineral, oil, and gas leases would be maintained, and lessees would continue operations. If removal of the wells is required, it would be done in accordance with all applicable Tribal, State, and Federal regulations. A joint-use agreement would be developed between the oil and gas operators and the solar operator. If access roads are modified by design plans, new access routes would be built and maintained for access to the oil and gas facilities. Therefore, no adverse direct, indirect, or cumulative impacts to mineral extractions are anticipated.

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**Land use:** The Proposed Action is consistent with the JAN's goals for the area and has been supported for development by the JAN. Therefore, no adverse direct, indirect, or cumulative impacts to land use are anticipated. The Proposed Action would provide a minor beneficial impact to land use by implementing a part of the JAN's renewable energy goals.

**Transportation networks:** Construction and operation of the project would not require the construction of new roads. The Applicant would coordinate with JAN Tribal Transportation/BIA to avoid existing roads as design progresses to maintain access to transportation routes within the area, in particular Indian Service Route 6, which passes through the project property. The project is in a rural area, and existing roads do not experience heavy use or traffic. Vehicles and haul trucks required for construction would result in a minor increase in traffic, but not to the extent to cause traffic congestion or delays to local users. All vehicles would be required to stay on existing roads and roads would be maintained to existing conditions. Construction, O&M, and decommissioning of the Proposed Action would be consistent with the BIA roads program and would not result in impacts to transportation networks.

There are no other developments proposed for the proposed project area. Any future development would be subject to the same coordination efforts with the JAN as implemented by the Applicant. Impacts associated with another solar development would be expected to be of a similar nature and scale. If additional solar projects are installed within the special use area, they would likely have additive impacts to wildlife habitat for elk and mule deer but would likely have similar minor negative impacts. Effects of the Proposed Action, when combined with past, present, and future actions, would have a minor contribution to the cumulative effects to hunting and gathering within the cumulative effects analysis area.

### **3.6.3. Impacts of Alternative B – No-Action Alternative**

The No-Action Alternative would not result in any direct, indirect, or cumulative impacts on resource use patterns.

## ***3.7. Other Values – Hazardous Materials***

### **3.7.1. Affected Environment**

**Hazardous materials:** A Phase I Environmental Site Assessment was conducted on the site in December 2022 to identify potential RECs at the project site. An REC is the presence or likely presence of any hazardous substance or petroleum product in, on, or at a property (1) due to any release to the environment, (2) under conditions indicative of a release to the environment, or (3) under conditions that pose a material threat of a future release to the environment. The Phase I Environmental Site Assessment did not identify any RECs on the project site (Tetra Tech 2022) (see Attachment 4). There is one canceled oil and gas well, one active oil and gas well, and three plugged oil and gas wells located on the site and two aboveground storage tanks. There are no brownfields, cleanup sites, landfills, leaking tanks, or Superfund sites located in the proposed project area (Tetra Tech 2022).

### **3.7.2. Impacts of Alternative A – Proposed Action**

**Hazardous materials:** Project design and construction would avoid all oil and gas facilities located within the proposed project area. Design features include procedures for suspected hazardous materials if encountered during construction or if a spill occurs due to an unforeseen circumstance,

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such as an equipment malfunction. Construction practices would adhere to the JAN Solid Waste Management Ordinance. The Applicant would maintain a safety plan to minimize ongoing risks related to fire and public safety. Therefore, no significant adverse impacts related to exposure of the public to hazardous materials are anticipated from the construction, O&M, or decommissioning of the Proposed Action.

### **3.7.3. Impacts of Alternative B – No-Action Alternative**

The No-Action Alternative would result in no changes to site use and, therefore, no adverse impacts or cumulative impacts related to hazardous materials or public health and safety would occur.

## **3.8. Visual Resources**

### **3.8.1. Affected Environment**

The proposed project area is in a remote, undeveloped area of the JAN. The terrain is flat to gently sloping up to the east-northeast, with little topographical relief, and dominant vegetation includes big sagebrush and other low-stature shrubs, grasses, and cacti. Approximately 3 miles to the east, the terrain rises to about 200 feet to form a series of low hills. Existing human-made visual elements on the proposed project area include dirt roads, electric utility poles, oil and gas facilities, and other solar facilities occurring in the distance. Overall, the scenic value of the project area is not distinct from the surrounding area in terms of landforms or vegetation. The other solar fields, substations, and other energy-related developments in the area are prominent disturbances that attract attention away from the natural landscape.

### **3.8.2. Impacts of Alternative A – Proposed Action**

Installing the solar facilities would introduce additional human-made visual elements to the overall landscape that are already found in other parts of the landscape. The solar arrays stand approximately 6 feet tall and would not obscure the views of the distant hills. The proposed fencing and O&M building would appear to alter the landscape and would be visually prominent in the foreground and middleground. These features would introduce modifications that are visually discordant and contrast with other elements and patterns in the landscape. Their spatial prominence and the uniform, rectangular form and color of the panels would attract attention. The new access road would be similar to existing features within the project area and would not attract attention. These elements, while common in the area, would notably change the existing landscape character and lower the scenic quality by increasing the spatial dominance of the solar arrays in the area.

Although the Proposed Action is in an area designated for wind and solar development, construction and O&M of the Proposed Action would result in a moderate negative impact to the overall visual character of the landscape. Decommissioning of the solar field would result in a positive impact as the proposed project area would be returned to a more natural, preconstruction condition.

There are no other developments currently planned for the proposed project area or adjacent areas. Any future development would be subject to the same regulatory review as implemented by the Applicant. Impacts associated with another solar development would be expected to be of a similar nature and scale. Effects of the Proposed Action, when combined with past, present, and future actions, would continue to change the existing landscape character and lower the scenic quality by increasing the spatial dominance of the Proposed Action in the area, resulting in a minor contribution to the cumulative effects for visual resources within the cumulative effects analysis area.

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### **3.8.3. Impacts of Alternative B – No-Action Alternative**

The No-Action Alternative would result in no changes to the visual character of the proposed project area; therefore, no adverse impacts or cumulative impacts related to visual resources would occur.

## **3.9. *Socioeconomics***

### **3.9.1. Affected Environment**

Socioeconomics describes the economic and social levels of populations based on income, education, demographics, and occupation. Executive Order 12898 addresses disproportionately high and adverse human health or environmental effects on minority and low-income populations (environmental justice communities). The population of Rio Arriba County is 40,363 people, with approximately 20.1% people being American Indian or Alaskan Native. Approximately 19.7% of the population of Rio Arriba County lives below the poverty level (U.S. Census Bureau 2020). According to the U.S. Census Bureau's American Community Survey (U.S. Census Bureau 2021b), the JAN has a population of 3,103, with the majority living in Dulce, New Mexico. The median household income for the JAN is \$46,681, with 20.7% living below the poverty level. The land comprising the proposed project area is held by the JAN and is not owned by individuals.

### **3.9.2. Impacts of Alternative A – Proposed Action**

The vast open spaces on the JAN, abundant solar resources, and relatively moderate summer temperatures make the area very attractive for solar PV energy generation. Although power generated from the Proposed Action would not be used on the JAN, this project is part of a strategy to develop an economic engine to drive the JAN forward. The Proposed Action provides direct long-term, positive economic benefits to the JAN in the form of ongoing lease payments throughout project operations, as well as fees to the JANPA to support electric infrastructure buildout for solar in the area. Construction employment and spending would provide a short-term positive impact to the local economy.

During O&M, expenditures on materials and supplies would generate tax revenues for Rio Arriba County over the operational lifespan of the Proposed Action. Payroll taxes during O&M would also generate revenue for Federal, State, and local treasuries. The potential effects on Tribal and public revenues from decommissioning would be similar to those from construction. These activities would provide a short-term stimulus to the local economy. Following decommissioning, the proposed project area would become available for other uses, including the historic, traditional use of the properties under Tribal stewardship.

Overall, the Proposed Action would have a minor, short-term, beneficial impact on Tribal and public revenues during construction and decommissioning. During O&M, the Proposed Action would have a long-term, major, beneficial impact on Tribal revenues, and a long-term, negligible, beneficial impact on public revenues in the surrounding region.

### **3.9.3. Impacts of Alternative B – No-Action Alternative**

The JAN would not benefit economically from the lease income and sale of other materials that would be generated by the Proposed Action. There would be no increase in employment and income on the JAN or in Rio Arriba County, and no additional tax revenues would be generated. Therefore, the No-Action Alternative would have no effect on socioeconomics for the JAN.

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### ***3.10. Living Resources – Terrestrial Vegetation***

#### **3.10.1. Impacts of Alternative A – Proposed Action**

According to the Biological Assessment that was completed for the Proposed Action (see Attachment 3) the area is part of the Great Basin Conifer Woodland biotic community. Two tree species characteristic of the Great Basin Conifer Woodland, one-seed juniper and pinyon pine, were observed in the northern and northeastern portions of the proposed project area. Dominant vegetation observed in the overall project area included big sagebrush, nodding buckwheat (*Eriogonum cernuum*), broom snakeweed (*Gutierrezia sarothrae*), flaxflowered ipomopsis (*Ipomopsis longiflora*), blue grama (*Bouteloua gracilis*), and James' galleta (*Hilaria jamesii*). This biotic community supports a variety of wildlife species, including a large variety of bird species, reptiles, small to medium-sized mammals, and large game species. Wild horses and cattle were also noted.

Additionally, several potential weed species were identified within the proposed project area (redstem stork's bill [*Erodium cicutarium*], mustard [*Brassica* sp.], burning bush [*Kochia scoparium*], and pepperweed [*Lepidum* sp.]). These are considered noxious/invasive in some areas and are non-native species.

#### **3.10.2. Impacts of Alternative A – Proposed Action**

Construction of the Proposed Action would require grading up to 25 acres and mowing, trimming, or compacting 1,000 acres of the 1,500-acre site. The undisturbed acreage represents avoidance areas for cultural resources and existing oil and gas operations. Grading would occur for the construction of building foundations and access roads. Mowing, trimming, or compacting vegetation would occur in the laydown areas and array fields. Construction activities could introduce or spread existing noxious or invasive weed species. Design features have been incorporated into the Proposed Action to minimize or otherwise eliminate potential for the introduction and spread of noxious or invasive weed species. These features include cleaning all construction equipment prior to entering the construction area. Additionally, disturbed areas would be reseeded after construction. Reseeding with native species can greatly reduce the potential for invasive species to take hold and spread. After construction, the disturbed areas would be returned to a natural grade and reseeded with native, low-stature plants. Fencing of the site would restrict the movements of some medium-sized mammals and game species. Birds, reptiles, and small mammals would still be able to utilize the area. Decommissioning of the site would remove all fencing and structures, and the site would be returned to a more natural state. Therefore, construction, O&M, and decommissioning of the Proposed Action would have a minor, adverse, short- and long-term impact on ecosystems and habitats within the proposed project area.

There are no other developments proposed for the proposed project area or in adjacent areas. Any future development would be subject to the same regulatory review as implemented by the Applicant. Impacts associated with another solar development would be expected to be of a similar nature and scale, such as additional vegetation compaction, trimming, and mowing. Effects of the Proposed Action, when combined with past, present, and future actions, would result in a minor contribution to the cumulative effects for vegetation from the preference for native low-stature plants and the exclusion of grazing activities within the lease boundaries.

#### **3.10.3. Impacts of Alternative B – No-Action Alternative**

The No-Action Alternative would result in no changes to the terrestrial vegetation that occurs across the proposed project area; therefore, no adverse impacts or cumulative impacts related to these resources would occur.

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## 4. CONSULTATION AND COORDINATION

Table 3 lists all individuals that were consulted or coordinated with during the development of this EA. Table 4 lists the preparers of this EA.

**Table 3. List of Individuals Consulted**

| <b>Name</b>        | <b>Title/Affiliation</b>   |
|--------------------|--|
| Kurt Sandoval      | Realty Specialist/BIA Jicarilla Agency   |
| Marlena Martinez   | Realty Specialist/BIA Jicarilla Agency   |
| Donna K. Kraidy    | DESCRM Supervisory Regional Environmental Scientist/BIA, Southwest Regional Office |
| Patricia Mattingly | NEPA DESCRM/BIA Southwest Regional Office  |
| Erin Laughlin      | Archaeologist/BIA Southwest Regional Office  |
| Jeff Blythe        | Tribal Historic Preservation Officer/Jicarilla Apache Nation                       |
| Kyle Tator         | Wildlife Biologist/Jicarilla Apache Nation   |
| Charlie Ferrell    | Jicarilla Apache Nation Power Authority  |
| Nann Winter        | General Council/Jicarilla Apache Nation Power Authority                            |

*Key:* BIA = Bureau of Indian Affairs; DESCRM = Division of Environmental, Safety, and Cultural Resources Management; NEPA = National Environmental Policy Act.

**Table 4. List of Preparers**

| <b>Name</b>       | <b>Title</b>   | <b>EA Section Contribution</b> |
|-------------------|--|--------------------------------|
| Allison Getty     | Senior Environmental Planner/<br>Environmental Compliance Lead | All Sections                   |
| Jennifer Jennings | Senior Environmental Planner/<br>Environmental Compliance Lead | All Sections                   |
| Bruce Pavlick     | Senior Biologist/NEPA Planner                                  | Biological Resources           |
| Trisha Rude       | Principal Investigator   | Cultural Resources             |
| Ali Talbot        | GIS Specialist   | All Sections                   |
| Moriah Sargent    | Technical Editor   | All Sections                   |

*Key:* EA = Environmental Assessment; GIS = geographic information system; NEPA = National Environmental Policy Act.

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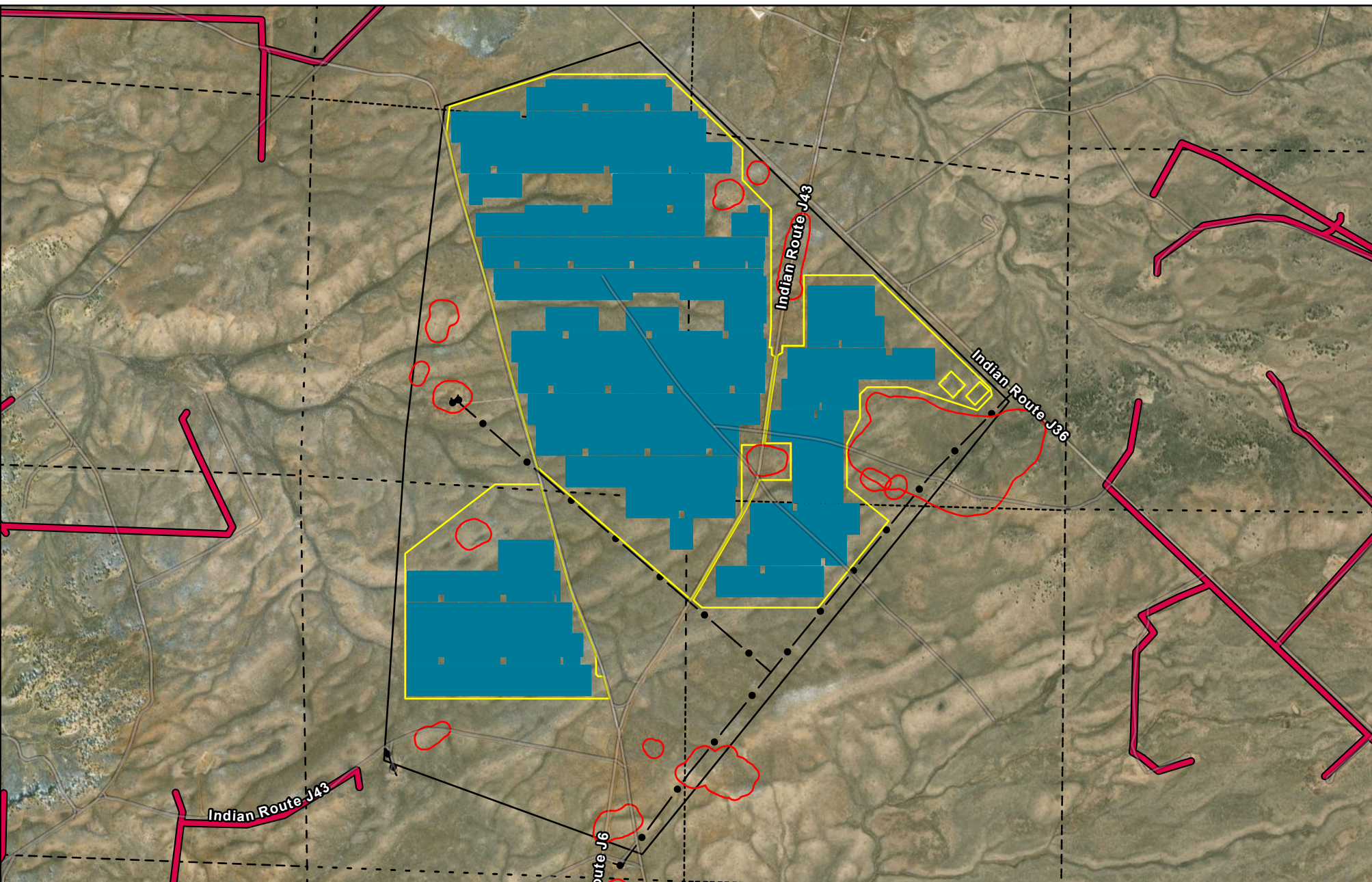


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## ATTACHMENT 1. SITE PLAN

National Renewable Solutions\Drmt - Documents\Drmt Projects\Solar\Utility\Shallow Basket Energy\SBE\12 Maps\SBE Project Overview 11022023.pdf

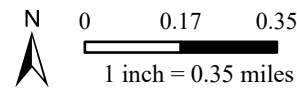
Data Sources: Bureau of Land Management (Accessed 2022), Esri, Gridworks



Date: 11/2/2023  
Created By: Dayton Fancher  
Spatial Reference:  
NAD 1983 StatePlane New Mexico  
Central FIPS 3002 Feet



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National Renewable Solutions, LLC



# Shallow Basket Solar

## Rio Arriba County, NM

### Legend

- |                          |                  |
|--------------------------|------------------|
| Cultural Avoidance Areas | Energy Pipelines |
| Fence                    | Gas Lines        |
| PV Modules               | Sections         |
| Project Footprint        |                  |

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## **ATTACHMENT 2. BIOLOGICAL ASSESSMENT**

# **Biological Assessment for the Proposed Affordable Solar Jicarilla Solar Energy Center 1 Project on Jicarilla Apache Nation Lands, Rio Arriba County, New Mexico**

*Prepared by:*

Jennifer N. Smith, Senior Biologist, M.A.

*Prepared for:*

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Jicarilla Agency Superintendent  
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*and*

Jicarilla Apache Game and Fish Department  
Attn: Kyle Tator, Wildlife Biologist  
P.O. Box 313  
Dulce, New Mexico 87528

*On behalf of:*

Affordable Solar  
Attn: Kevin Bassaleck  
4840 Pan American East Freeway NE  
Albuquerque, New Mexico 87109

Tierra Project No. 21TE00-487.01  
August 16, 2022



Tierra Right of Way Services, Ltd.  
1575 East River Road, Suite 201  
Tucson, Arizona 85718

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## ABSTRACT

|                             |  |
|-----------------------------|--|
| PROJECT TITLE:              | Biological Assessment for the Proposed Affordable Solar Jicarilla Solar Energy Center 1 Project on Jicarilla Apache Nation Lands, Rio Arriba County, New Mexico  |
| LAND STATUS:                | Jicarilla Apache Nation  |
| PROJECT DESCRIPTION:        | A Biological Assessment of a proposed solar facility study area was conducted by Tierra Right of Way Services, Ltd. (Tierra), to determine whether any Federally listed Threatened or Endangered species would be impacted by the proposed project.  |
| FIELDWORK DATES:            | June 1–7, 2022   |
| AREA SURVEYED:              | Approximately 607 ha (1,500 acres)   |
| MANAGEMENT RECOMMENDATIONS: | <p>No Federally listed Threatened or Endangered species were observed in the project area at the time of the field survey. It was further determined that the project area does not contain suitable habitat for any of the seven Federally listed species assessed in this report.</p> <p>Tierra recommends that a “no effect” determination is appropriate for the project regarding its potential impacts to species listed under the Endangered Species Act.</p> |



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## 1.0 INTRODUCTION

At the request of Affordable Solar, Tierra Right of Way Services, Ltd. (Tierra), performed a biological reconnaissance survey of an approximately 607-ha (1,500-acre) study area for a proposed 150 MW solar electrical power generation facility located on Jicarilla Apache Nation (JAN) lands in Rio Arriba County, New Mexico. Affordable Solar, the project proponent, is providing design and engineering services for the project and would own and operate the solar facility. The purpose of Tierra's survey was to record wildlife, native plants, and noxious weeds and to assess the project area for any potential impacts to U.S. Fish and Wildlife Service (FWS)–listed Threatened and Endangered species or their habitats that may result from the proposed development.

This Biological Assessment includes a description of the project area, the proposed project, survey methods, existing conditions, listed species and findings, and Tierra's recommendations.

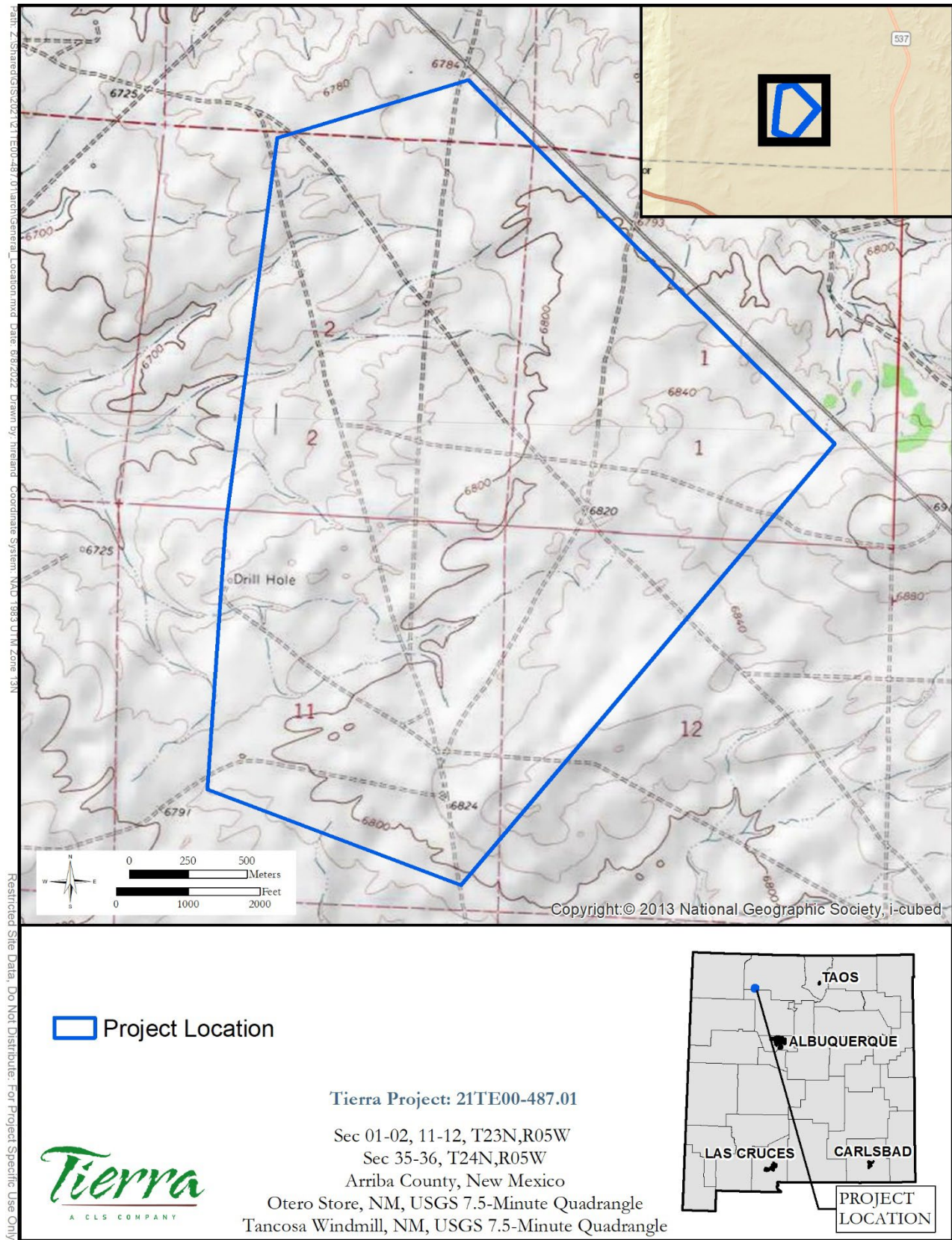
### 1.1 *Project Location*

The study area is in northwestern New Mexico, just west of New Mexico Highway 537, approximately 8 km (5 miles) north of U.S. Highway 550, and approximately 19.0 km (11.8 miles) east of Counselor, New Mexico. The northeastern portion of the project area parallels Indian Service Route J36 and there are several unnamed dirt roads located throughout the project area. A partially constructed solar facility is located approximately 2.4 km (1.5 miles) southeast. Specifically, the study area is located in Sections 1–2 and 11–12, Township 23 North, Range 5 West and Sections 35–36, Township 24 North, Range 5 West, New Mexico Principal Meridian, as depicted on the Otero Store and Tancosa Windmill, New Mexico, 7.5-minute U.S. Geological Survey quadrangles (Figure 1).

### 1.2 *Project Description*

The proposed project includes the development of a solar electrical power generation facility on approximately 607 ha (1,500 acres) of Tribal land with 150 MW alternating current (AC) of ground-mounted photovoltaic arrays and a 40 MW/160 MWh battery energy storage system that will connect to an existing JAN Power Authority (JANPA) and Public Service Company of New Mexico substation via a new 345 kV transmission tie line. The tie line will be constructed and permitted by JANPA and is not considered part of the project. Approximately 330,000 modular photovoltaic panels will be installed on racks mounted on driven piles within the project footprint. The panels will be connected to 1,500 direct current/3,510 kW alternating current (DC/AC) inverters installed at the end of panel rows and to a single step-up transformer, placed in a central location, that would boost the AC voltage produced by the inverters up to the 345 kV required by the transmission tie line. The proposed facility will also include 40 MW of battery storage to allow the facility to generate electrical power at night and during inclement weather conditions. The facility will be fenced following construction, but access will be maintained from Indian Service Route J36. Construction of the solar facility will include permanent ground and vegetation disturbance up to the entire extent of the 607-ha (1,500-acre) site. A 3.7-m-wide (12.0-foot-wide) access road will be located within the project area to provide construction access and future maintenance of the facility.

Affordable Solar is requesting a 20-year term, and the facility would be used year-round. Construction is anticipated in 2023 and would take approximately 10–12 months.



**Figure 1. Project location.**



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## 2.0 METHODS

Prior to conducting the biological evaluation survey, Tierra Senior Biologist Jennifer Smith, M.A., reviewed the FWS Information Planning and Conservation System Official List of Threatened and Endangered species for the project vicinity in Rio Arriba County to obtain information on biological resources that may be present in the project area. After compiling a list of species potentially occurring in the project area, Ms. Smith conducted reconnaissance surveys of the project area June 1–7, 2022. During the surveys, the solar site was divided into four quadrants based on the locations of existing roads that diagonally cross the site, and looping transects were walked in each quadrant. Special status species listed in section 4.1 were assessed for their potential to occur in the project area based on the existing characteristics of the area. Project area photographs can be found in Appendix A.

## 3.0 DESCRIPTION OF EXISTING CONDITIONS

### 3.1 General Overview

The project area consists of rangeland with interspersed oil and gas development. The topography of the solar site is relatively flat with a slight western aspect, but it also crosses gently rolling terrain. The elevation of the overall project area ranges from approximately 2,042 to 2,195 m (6,700 to 7,200 feet) above mean sea level (AMSL).

### 3.2 Climate

The National Oceanic and Atmospheric Administration records seasonal climatic data at the Lybrook weather station, located approximately 27 km (17 miles) west of the project area at a similar elevation. Data summarized in the Period of Record Monthly Climate Summary from 1991 to 2020 include average maximum temperature, average minimum temperature, and average total precipitation (NOAA 2020). The average annual maximum temperature within the project area is 61.5°F, the hottest month of the year being July, with an average maximum temperature of 84.1°F. The average minimum temperature within the project area is 35.4°F, with December having the coldest average temperature of 15.5°F. The project area receives average annual precipitation of 26.1 cm (10.3 inches), with August having the highest average rainfall of 5.0 cm (1.9 inches).

### 3.3 Biotic Community

The project area is located within the Great Basin Conifer Woodland biotic community, as described and mapped by Brown (1994). Great Basin Conifer Woodland is structurally one of the simplest communities in the Southwest, with two dominant conifers: juniper (*Juniperus* sp.) and Pinyon Pine (*Pinus edulis*). Pinyon-juniper woodland covers extensive areas ranging from 1,050 to 2,700 m (3,450 to 8,850 feet) AMSL with an average elevation of 1,500–2,300 m (4,900–7,550 feet) AMSL. Common juniper species found in this biotic community include Rocky Mountain Juniper (*Juniperus scopulorum*) within the higher and colder woodlands and Oneseed Juniper (*Juniperus monosperma*) in the central and more southern portions of New Mexico. Junipers are often found at lower elevations than Pinyons, and normally appear within sites having deeper soil and elevations below 2,680 m (8,800 feet) AMSL. Typically, the understory consists of subshrubs such as snakeweed (*Gutierrezia* sp.) and Threadleaf Groundsel (*Senecio longilobus*), and grasses such as James' Galleta (*Hilaria jamesii*), Indian Ricegrass (*Oryzopsis hymenoides*), Western Wheatgrass (*Agropyron smithii*), muhley (*Muhlenburgia* spp.), dropseed (*Blepharoneuron* spp.), and Prairie Junegrass (*Koeleria cristata*). Other plant species found in Great Basin Conifer Woodland include Cliffrose (*Cowania stansburiana*), Apache Plume (*Fallugia paradoxa*), ephedra

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(*Ephedra* spp.), barberry (*Mahonia* spp.), Four-wing Saltbush (*Atriplex canescens*), Buffaloberry (*Shepherdia canadensis*), Antelope Bitterbrush (*Purshia tridentata*), penstemons (*Penstemon* spp.), lupines (*Lupinus* spp.), bromes (*Bromus* spp.), hedgehog cactus (*Echinocereus* spp.), prickly pear cactus (*Opuntia* spp.), and cholla cactus (*Cylindropuntia* spp.) (Brown 1994).

Wildlife species endemic to Great Basin Conifer Woodland include the Pinyon Mouse (*Peromyscus truei*), Pinyon Jay (*Gymnorhinus cyanocephalus*), Gray Flycatcher (*Empidonax wrightii*), woodrat (*Neotoma* sp.), Gray Vireo (*Vireo vicinior*), Black-throated Gray Warbler (*Dendroica nigrescens*), Scott's Oriole (*Icterus parisorum*), and Plateau Whiptail (*Cnemidophorus velox*). More widely distributed animals include Rocky Mountain Elk (*Cervus elaphus*) and Mule Deer (*Odocoileus hemionus*) (Brown 1994).

### **3.4 Vegetation in the Project Area**

Two tree species characteristic of the Great Basin Conifer Woodland, Oneseed Juniper and Pinyon Pine, were observed during the surveys only in the northern and northeastern portions of the solar site. Dominant vegetation observed in the overall project area included Big Sagebrush (*Artemisia tridentata*), Nodding Buckwheat (*Eriogonum cernuum*), Broom Snakeweed (*Gutierrezia sarothrae*), Flaxflowered Ipomopsis (*Ipomopsis longiflora*), Blue Grama (*Bouteloua gracilis*), and James' Galleta. Other plant species observed included Greasewood (*Sarcobatus vermiculatus*), Prairie Sagewort (*Artemisia frigida*), Longflower Rabbitbrush (*Chrysothamnus viscidiflorus*), Plains Prickly Pear (*Opuntia polyacantha*), Spiny Star (*Escobaria vivipara*), Winterfat (*Krascheninnikovia lanata*), Indian Ricegrass, and Desert Wheatgrass (*Agropyron desertorum*). A complete list of plants identified in the project area can be found in Appendix B.

### **3.5 Invasive, Non-Native Plant Species**

No plant species appearing on the U.S. Department of Agriculture Federal Noxious Weed List were identified in the project area at the time of the surveys.

### **3.6 General Wildlife in the Project Area**

Wildlife observed in the project area at the time of the surveys included American Kestrel (*Falco sparverius*), Horned Lark (*Eremophila alpestris*), Mountain Bluebird (*Sialia currucoides*), Western Meadowlark (*Sturnella neglecta*), Common Raven (*Corvus corax*), Black-tailed Jackrabbit (*Lepus californicus*), Western Hognose snake (*Heterodon nasicus*), and Domestic Cattle (*Bos taurus*). Animal signs observed during the surveys included Ord's Kangaroo Rat (*Dipodomys ordii*) burrows and raceways, Botta's Pocket Gopher (*Thomomys bottae*) mounds, woodrat middens, and Coyote (*Canis latrans*), Eastern Cottontail (*Sylvilagus floridanus*), Black-tailed Jackrabbit, cattle, and Horse (*Equus caballus*) scat.

The entire solar site was found to exhibit extensive use by Pronghorn (*Antilocapra americana*), Mule Deer, and Elk (*Cervus canadensis*), as evidenced by the presence of scat and tracks of all three species. Mule Deer and Elk are managed as big game species by the Jicarilla Apache Game and Fish Department (JAGFD), and they are likely using the proposed solar site for migration, foraging, and possibly cover habitat.

### **3.7 Waterways**

There are no perennial or intermittent waterways in the project area; however, ephemeral waterways are present within the solar site.

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## 4.0 FINDINGS

### 4.1 *Listed Species*

Listed species were determined through a review of the FWS official list of Threatened and Endangered species for the project vicinity in Rio Arriba County, New Mexico (Appendix C). The FWS lists seven wildlife species (two Endangered, three Threatened, and two Candidate), no flowering plant species, and no critical habitats for the project area in Rio Arriba County.

The determinations of a listed wildlife species' potential for occurring in the project area was performed after the field survey by analyzing four aspects of what constitutes suitable habitat. Suitable habitat can contain one or more of the following: foraging habitat, residential habitat, resting habitat, and mating habitat. Foraging habitat for a species contains food items, such as prey species and plants, and can also contain a water source. Residential habitat is a species' home, such as a burrow, nest, or some other form of shelter. Resting habitat can include temporary shelters, such as shade under a tree, shrub, or rock, and for bird species, perches for roosting or casual use. Mating habitat can be as simple as an area where other same-species individuals can be found, or can be more complex, such as a lekking area or other space used for mating displays.

Suitable habitat for plant species is determined by whether a suitable combination of soils, moisture, exposure, elevation, and other factors required by a given plant species is present within the area of concern. The biotic community of an area in question is also important; for example, a desert obligate plant is extremely unlikely to occur in a Petran Montane Conifer Forest biotic community.

### 4.2 *FWS-listed Species Assessment*

FWS-listed species were assigned to one of three categories of possible effect following FWS recommendations. The FWS recommends the following effects determinations:

- “*May affect, is likely to adversely affect*”—The project is likely to adversely affect a species if the species is known to occur in the project area, and project activities would disturb areas or habitat elements known to be used by the species or would directly affect an individual.
- “*May affect, is not likely to adversely affect*”—The project is not likely to affect a species if the species may occur, but its presence has not been documented, and project activities would not result in disturbance to areas or habitat elements known to be used by the species.
- “*No effect*”—The project will have no effect on a species if the species is considered unlikely to occur because the known range, vegetation type, etc. are inappropriate, and the species or its sign was not observed during surveys of the project area.

After analysis of the data, all seven listed species were removed from further consideration either because the project area is outside their known range or because suitable habitat is not present in the project area. Justification for the exclusion of these species can be found in Appendix D.

Tierra recommends that a “no effect” determination is appropriate for the project regarding its potential impacts to species listed under the Endangered Species Act.

### 4.3 *Migratory Birds and Raptors*

Migratory bird species occur in the project area. While no nests were observed during the surveys, the potential for undiscovered nests in the project area exists, and new nests could be built in the

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vegetation present in the project area prior to construction. The proposed project has the potential to have an adverse impact on individual birds, eggs, young, or the nesting habitat of both tree- and ground-nesting birds. These potential impacts can be avoided if construction occurs outside the spring-to-mid-summer migratory bird breeding season.

No raptor species were observed in the proposed solar site at the time of the surveys. The project area does not contain trees of sufficient size or cliffs that would provide nesting habitat for these species and other raptors; however, the area does contain foraging habitat supporting abundant prey species for raptors, including Black-tailed Jackrabbit and Eastern Cottontail.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

No Federally listed Threatened or Endangered species were observed in the project area at the time of the field survey. It was further determined that the project area does not contain suitable habitat for any of the seven special status species assessed in this report.

Tierra recommends that a “no effect” determination is appropriate for the project regarding its potential impacts to species listed under the Endangered Species Act.

Construction of the solar facility would remove up to 607 ha (1,500 acres) of foraging habitat supporting prey species for raptors and suitable and occupied habitat for two big game species managed by the JAGFD, Elk and Mule Deer. This amount of habitat removal would be minor in relation to the approximately 348,330 ha (860,000 acres) of potentially available habitat for these species within the JAN.

## **6.0 CERTIFICATION**

Tierra believes that the proposed project would not violate any of the provisions of the Endangered Species Act of 1973, as amended. Conclusions are based on pre-field visit research and the field visit.

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## 7.0 REFERENCES

- Brown, David E. (editor)  
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- NOAA (National Oceanic and Atmospheric Administration)  
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