



Sienna Solar and Storage Project

Visual Resources Assessment

prepared for

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1 Introduction and Setting

1.1 Project Description Summary

The proposed Sienna Solar and Storage Project (Project) is a 525-megawatt (MW) utility-scale solar farm with 525-MW battery storage located in unincorporated San Bernardino County. The site is located east of Barstow Road/State Route (SR) 247 roughly between Northside Road and Wilshire Road, northeast of the community of Lucerne Valley. The Project consists of the installation of a photovoltaic (PV) solar facility, Battery Energy Storage System (BESS), project substation, Operations and Maintenance building(s), underground collection system, and a 230-kV generation-interconnect (gen-tie) line. The Sienna Project will interconnect at the SCE Calcite Substation (currently pending environmental clearance and construction) via a proposed overhead and/or underground 230-kV gen-tie line in addition to other ancillary facilities utilizing private and potentially public ROWs. The Project area encompasses approximately 1,854 acres with an additional 77-acre substation site. Approximately 39 miles of collector lines and gen-tie alternatives will be analyzed in this Assessment, although not all routes will be developed.

1.2 Project Location and Environmental Setting

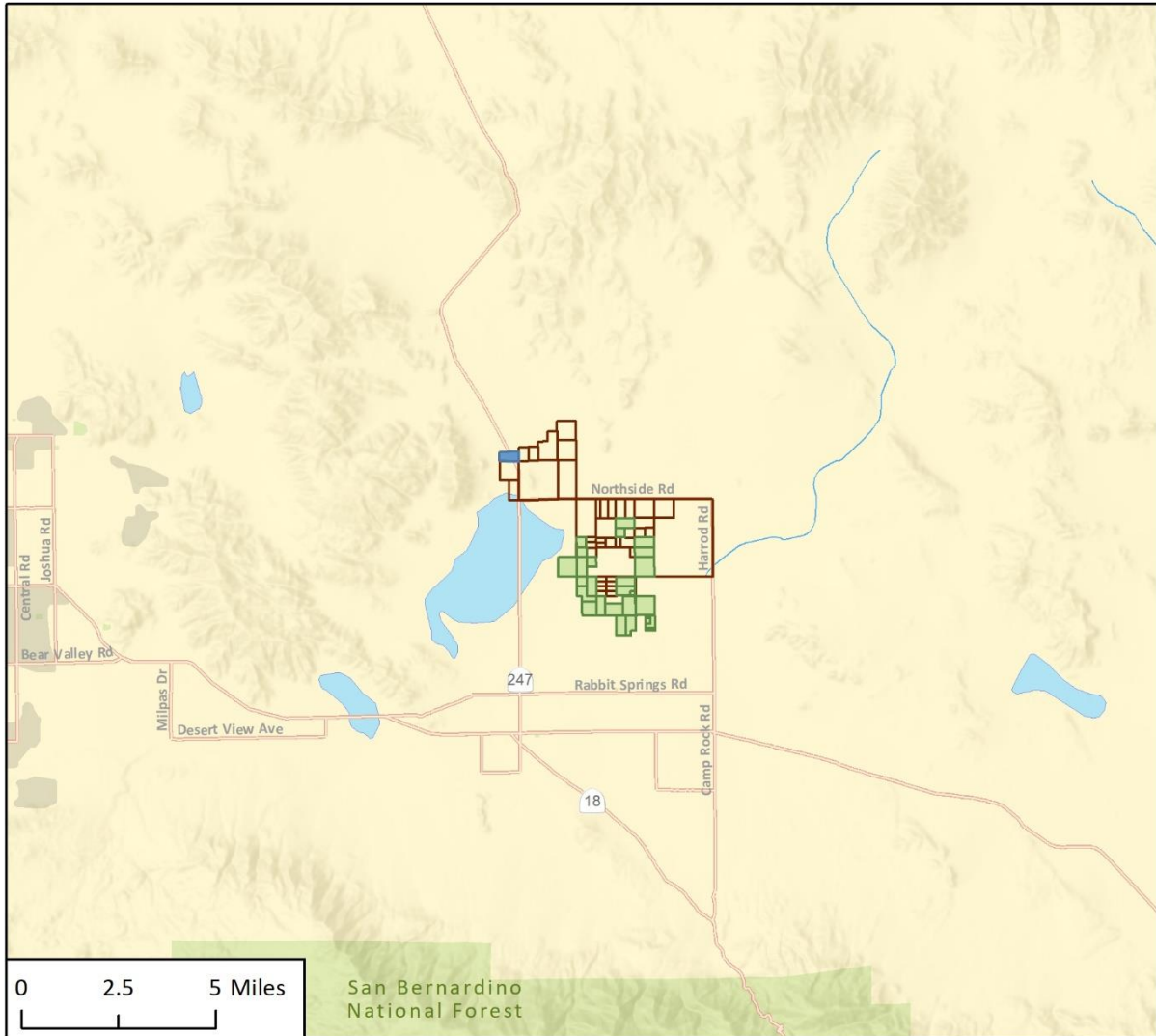
The approximately 1,854-acre Project area is located in the southwestern portion of Mojave Desert in and near Lucerne Dry Lake, in unincorporated San Bernardino County, California. The Project is predominately located east of State Route 247 (Barstow Road), north of the unincorporated community of Lucerne Valley, with portions of the gen-tie alternative corridors that include possible connections along Haynes Road, Huff Road, and Northside Road to the east of Barstow Road. It is generally located approximately 35 miles south of the City of Barstow, 45 miles northwest of the town of Yucca Valley, 15 miles southeast of the town of Apple Valley, and 20 miles north of the City of Big Bear Lake. Barstow Road would provide primary access to the project area. Land uses in the area are primarily rural residential, recreation, farmland, open space, and transportation corridors.

Figure 1 shows the regional location of the Project area, while Figure 2 depicts the regional landscape setting.

1.2.1 Regional Character

San Bernardino County contains three distinct geographic regions: the Mountain Region, the Valley Region, and the Desert Region. The project area and surrounding vicinity are in the Desert Region, which is visually characterized by its arid landscape, consisting of desert plains, sparsely vegetated mountain ranges, and broad valleys with expansive alluvial fans and scattered dry lakes. The Project area is primarily located on the floor of the Lucerne Dry Lake, and along its eastern and northern margins. Topography is mostly flat to gently sloped along the dry lake margins. Elevation of the Project area ranges between 2,850 and 2,910 feet above mean sea level. The Granite Mountains and White Horse Mountain are west of the Project area, and Peterman Hill is within the overall Project footprint, east of Barstow Road. The Ord Mountains, a weathered rugged volcanic range, trending east-west with a peak elevation of 6,309 feet above mean sea level, are approximately 10 miles to the northeast. The mountain ranges surrounding the valley rise approximately 2,300 to 3,400 feet above the valley floor, and the silhouette of ridgelines dominates the viewshed.

Figure 1 Regional Location Map



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- Project Site
- Proposed SCE Calcite Substation
- Gen-tie Line and/or Collector Line Alternatives

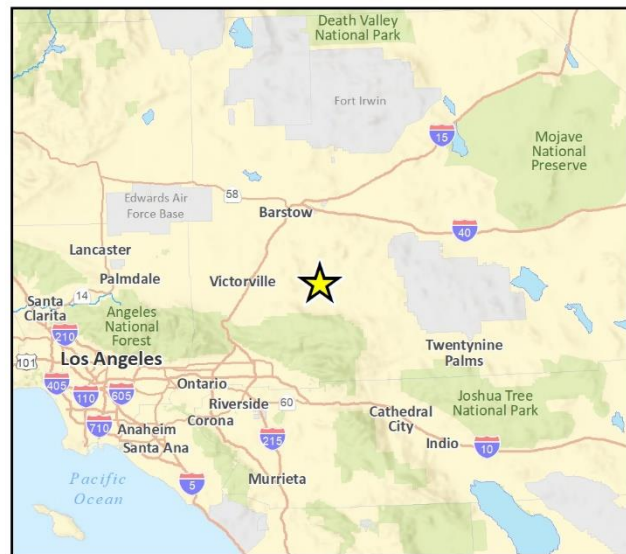
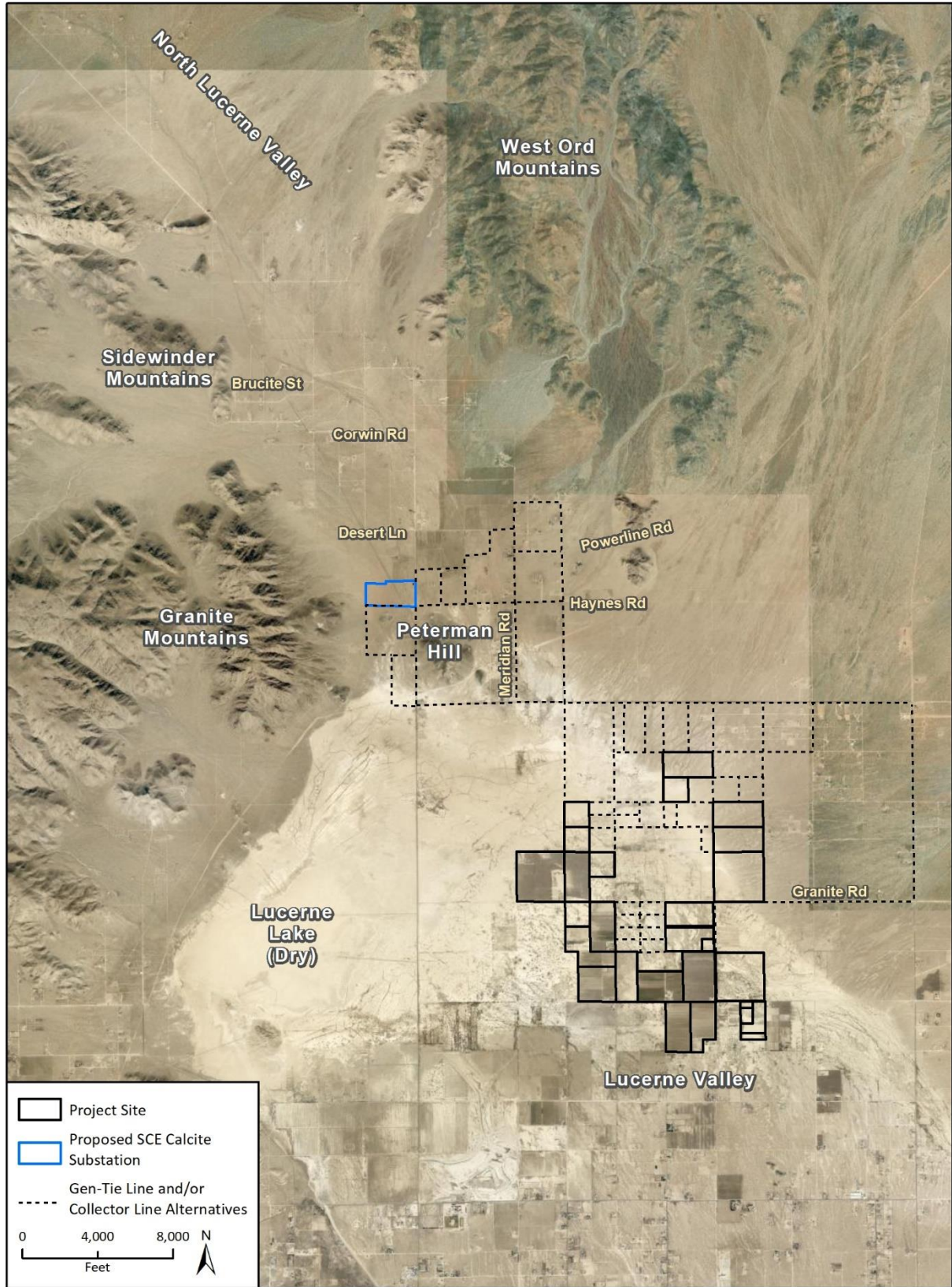


Fig 1 Regional Location

Figure 2 Regional Landscape Setting



Sienna Solar and Storage Project

The dry lakebed is heavily used for recreational activities, including off highway vehicle (OHV) travel (including racing) and assorted day use and camping activities. The Rocketry Organization of California (ROC) uses the dry lake as one of its designated launch sites, with scheduled launches occurring monthly throughout the year. Additionally, areas outside the dry lake within the Project area are also subject to various ongoing disturbances related to road maintenance, utility activities (electrical transmission towers and lines; underground gas pipeline), recreation, OHV travel, and illegal dumping.

1.2.2 Surrounding Land Uses

The Project area includes areas zoned as Lucerne Valley/Resource Conservation (LV/RC), Lucerne Valley/Rural Living (LV/RL), and Lucerne Valley/Agriculture (LV/AG) (San Bernardino County 2016). Portions of the gen-tie corridor routes are also in areas zoned as Lucerne Valley/Rural Living – 5 Acre Minimum (LV/RL-5) and Lucerne Valley/Agriculture- 40 acre minimum (LV/AG-40). Primary uses in and immediately surrounding the Project area are rural residential, recreation, open space, and transportation corridors.

1.2.3 Project Setting

The natural landscape of the Project area consists of a generally land surface, sloping up to craggy mountains in the distance in all directions, with intervening small rocky hills. The landscape is characterized by bare tan soil or low golden grasses punctuated by low, mounded olive or dark green shrubs.

The built environment of the Project vicinity is dominated by a lattice of paved and dirt roads extending from SR 247, which runs generally north-south to the west of the project area. Several large regional power lines supported by tall steel lattice towers run east-west in the project vicinity. Low wood post and wire fences are present throughout the project vicinity, as are small, single-story residences dotting the landscape, some of which have substantial stands of trees planted, serving as visual screening. Also present and visible are the wood poles of local electrical distribution lines providing service to the residences.

The visual character of the Project area and vicinity is illustrated and described in Figure 3 and Figure 4.

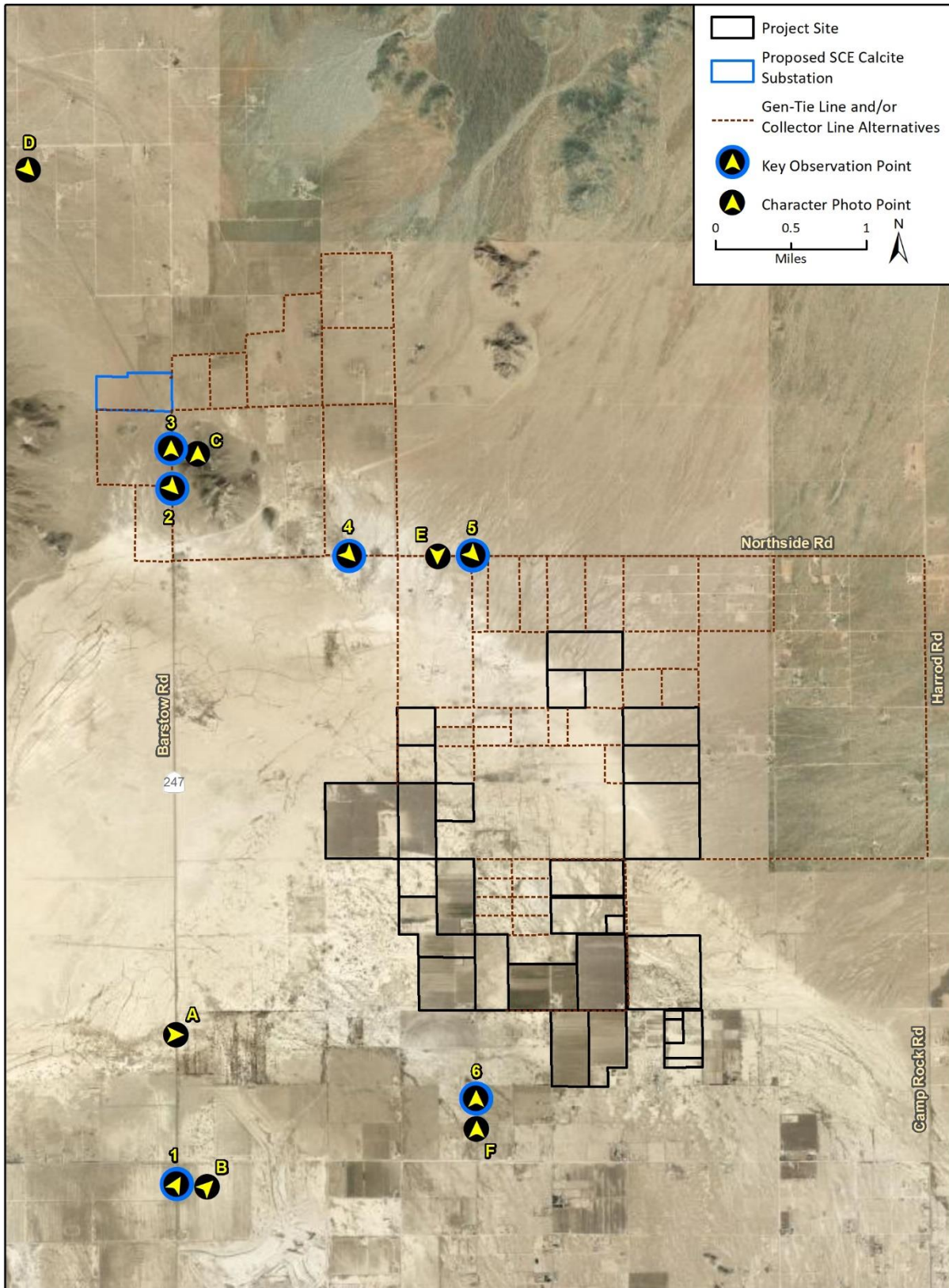
1.2.4 Scenic Routes

SR 247 and SR 28 are eligible for California State Scenic Highway Designation (Caltrans 2018). The County of San Bernardino has also designated SR 247 in the Project vicinity as a Scenic Route (County of San Bernardino 2020).

1.2.5 Vista Points

There are no Department of Transportation (DOT) vista points on state highways within the Project vicinity. The nearest vista point identified by Caltrans is the Bear Valley Dam Vista Point in the San Bernardino Mountains, approximately 20 miles south of the Project area. The Project area is not visible from this vista point (Caltrans 2015).

Figure 3 Photo Point Locations



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Fig 3 Photo Point Locations 20230306

Figure 4 Project Area Character Photographs



Photograph A. View looking east from SR 247 toward the southernmost extent of the Project area, approximately 1.6 miles distant. Photograph A is representative of views for motorists on SR 247. The Project area is generally flat, sloping up to the craggy mountain in the distance. The landscape is characterized by bare tan soil punctuated by low, mounded olive-green shrubs. A large regional power line supported by tall steel lattice towers that run east-west is visible on the right-hand side of the photograph.



Photograph B. View looking northeast from SR 247 toward the center of the Project area. Photograph B is representative of views for motorists traveling north on SR 247. A deteriorated low wood post and wire fence is located adjacent to SR 247 and is characteristic of fences throughout the Project vicinity. Low golden grasses dominate the view, with sparse dark green shrubs in the middleground and mountains in the distance.



Photograph C. View to the north from SR 247 at Fern Road toward the northern extent of the Project area. Photograph C is representative of views for motorists traveling north on SR 247. The near and middleground land surface is generally level, sloping up to the mountain range in the background, approximately 8 miles from the viewing location. Tan soils and low shrubby olive-green vegetation characterize the landscape. A major transmission line corridor with different types of lattice steel structures extends west to east across the view.



Photograph D. View to the southeast from SR 247 toward the northern portion of the Project area. Photograph D is representative of views for motorists traveling south on SR 247. The landscape is dotted with sparse low vegetation and remote single-story rural residences. The wood poles of local electrical distribution lines paralleling dirt roads are visible in the middleground view. Small rocky hills punctuate the center of the view, while the San Bernardino Mountains are distantly visible in the right-hand side of the view.



Photograph E. View to the south from Northside Road toward the Project area. Photograph E is representative of project views for area residents. Exposed tan soils and sparse, low, dusty-green shrubs dominate the landscape. Small, single-story residences dot the landscape, some of which have substantial stands of trees planted, serving as visual screening. Also visible are the wood poles of local electrical distribution lines providing service to the residences. The visible landscape is generally flat, before sloping up into the San Bernardino Mountains, 12 to 15 miles distant.



Photograph F. View to the northeast from Locust Avenue, at the southernmost extent of the Project area. Except for the rocky mountains in the distance, the landscape is generally flat, with exposed tan soils and golden grasses, except where taller green vegetation in the middleground identifies residential areas. The lattice steel towers of a high-voltage powerline are visible in the middleground, as are the wood poles associated with local electrical distribution lines.

2 Methodology

The initial step in the evaluation process was the review of planning documents applicable to the Project area to gain insight into the type of land uses intended for the general area, and the guidelines given for the protection or preservation of visual resources. Consideration was then given to the existing visual setting within the Project viewshed, which is defined as the geographical area in which the Project can be seen. A desktop analysis was conducted to identify the areas from which the proposed Project will have the potential to be visible. Site reconnaissance was conducted to view the Project area and surrounding vicinity, identify potential Key Observation Points (KOPs), and take representative photographs of existing visual conditions. Photographs from the site reconnaissance were selected to represent the “before” conditions from each of the potential KOPs. Within the viewshed area, seven KOPs were selected to be used as the basis for analysis of the proposed Project’s visual effects. An effort was made to identify sensitive receptors¹ and viewing areas that would be the most sensitive to the proposed Project’s potential visual impacts. Three of the selected KOPs are locations along SR 247, a County-designated scenic highway. These KOPs present representative views for both local residents and local or transient recreationists. The other three KOPs were selected to be representative views for local residents.

To provide a basis for evaluating the visual effect of the proposed Project on these views, visual simulations were produced to illustrate the “after” visual conditions from each of the KOPs. The proposed facilities were modeled based on design information provided by 99MT 8me, LLC and included both the solar array as well as gen-tie lines.

One proposed gen-tie route was selected for the simulations to be representative of the different gen-tie route alternatives. This route extends from the solar array at Watking Road, north along Huff Road to Haynes Road, and then west to the proposed 230-kV substation. Single-circuit tubular steel poles (TSPs) at 1,000-foot spacing were assumed, each 88 feet tall, with a 5-foot base diameter. The collector lines connecting the solar arrays will be buried and are therefore not shown in the simulations.

The simulations were produced from photography of the Project area and 3D modeling of a typical solar array design. For purposes of the simulations, the panel array is assumed to consist of an 8-foot fixed panel on a 20-foot tall post, with a 10-foot access lane between rows of panels. The perspective and lighting of each KOP view was matched to the 3D model and the proposed views were rendered. Foreground elements in the photographs were masked out and the 3D rendering was composited with the background. Atmosphere, noise, and blur was added to the 3D rendering to match the photography.

At each KOP, the existing visual conditions were compared to those under the development of the Project area, based on the visual simulations. The comparison, included in Section 3, considers the existing quality of scenic backdrops, background vistas, and foreground views across the Project area and the Project’s alteration of these scenic views.

¹ Typically, residents and recreationists are considered to be sensitive receptors to change in the landscape. This is because of the potential for effects to their long-term views or their enjoyment of a particular landscape or activity.

3 Key Observation Points and Anticipated Visual Effects

3.1 KOP Evaluation

Figure 3 shows the location of the six KOPs that were selected to be used as the basis for analysis of the proposed Project's visual effects. A discussion of the existing view and the anticipated visual effect of the proposed Project at each of these KOPs is provided below. A comparison of the existing view and the simulated with-Project view for each KOP is used as the basis for the evaluation.

3.1.1 KOP 1

Figure 5, Photograph 1 documents the existing north-northeastern view toward the Project area from SR 247 near its intersection with Holmes Road, and Figure 5, Photograph 2 shows a simulation of the view as it will appear after construction. The existing view to motorists on SR 247 includes deteriorated low wood post and wire fencing, as well as wood post distribution lines paralleling the roadway. Low golden grasses dominate the view, with sparse dark green shrubs in the middleground and mountains in the distance.

As shown in the simulated view, the solar array presents as an indistinct horizontal linear feature in the middleground of the view, beyond the dotting of low shrubs. The existing high voltage transmission line remains the most visible man-made structure in the middleground of the view. From KOP 1, the proposed Project is not identifiable as a new feature in the landscape and would not introduce an impact to visual resources.

3.1.2 KOP 2

Figure 6, Photograph 1 documents the existing southeast view toward the Project area from SR 247 near Peterman Hill, and Figure 6, Photograph 2 shows a simulation of the view as it will appear after construction. The existing view for southbound motorists on SR 247 includes a landscape dotted with low vegetation. The distant San Bernardino Mountains dominate the view.

As shown in the simulated view, the solar facility is nearly imperceptible when viewed from the roadway and would likely be go unobserved by motorists traveling on SR 247. From KOP 2, the proposed Project is not identifiable as a new feature in the landscape and would not introduce an impact to visual resources.

3.1.3 KOP 3

Figure 7, Photograph 1 documents the existing northern view toward the Project area from SR 247 near Peterman Hill, and Figure 7, Photograph 2 shows a simulation of the view as it will appear after construction. The existing view to northbound motorists on SR 247 includes generally flat land surfaces in the near and middleground, dipping down then sloping up to the mountain range in the background. Tan soils and low shrubby olive-green vegetation characterize the landscape, and a major transmission line corridor with different types of lattice steel structures extends west to east across the view.

As shown in the simulated view, new tubular steel poles associated with the 230- kV gen-tie line would be visible, along with the new 230-kV substation². From KOP 3, the proposed Project would bring a new industrial character to the view, but the proposed infrastructure is consistent with the existing high-voltage transmission infrastructure and the mountains to the north remain the most prominent visual feature.

3.1.4 KOP 4

Figure , Photograph 1 documents the existing southeast view toward the Project area from Northside Road between Meridian Road and Huff Road, and Figure , Photograph 2 shows a simulation of the view as it will appear after construction. Multiple rural residences are located nearby, and residents would experience similar views. The existing view includes an extremely flat landscape with exposed tan soils and sparse, low, dusty-green shrubs and golden grasses in the middleground. White-tarped hoop houses contrast with the darker, mountain backdrop. Short fencing with wooden post and thin wire mesh line Northside Road, and distribution lines are strung along the roadway.

As shown in the simulated view³, the solar facility would introduce larger-scale utilities to the landscape. From KOP 4, the proposed Project would introduce a new industrial character to the view. In particular, new 230-kV TSPs associated with the gen-tie line are skylined⁴ above the hills and mountains in the distance, emphasizing their introduction to the landscape. As a result, the proposed Project introduces a moderate amount of visual contrast to the view from KOP 4.

3.1.5 KOP 5

Figure , Photograph 1 documents the existing southeast view toward the Project area from Northside Road near the intersection of Logoo Street and Locust Avenue, and Figure , Photograph 2 shows a simulation of the view as it will appear after construction. The existing view includes an extremely flat landscape with exposed tan soils and sparse, low, dusty-green shrubs and golden grasses in the middleground. Distribution lines are strung along Northside Road.

As shown in the simulated view⁵, the solar facility would be faintly visible as a linear feature. The new 230-kV TSPs associated with the gen-tie line are not visible in the with-Project view from KOP 5, leaving the hills and mountains in the distance as the most prominent visual features in the landscape.

3.1.6 KOP 6

Figure , Photograph 1 documents the existing northern view toward the Project area from Locust Avenue, between Sunswept Drive and Wilshire Road, and Figure , Photograph 2 shows a simulation of the view as it will appear after construction. The existing view includes a generally flat landscape,

² The simulated view shows the solar facility as a linear feature in the middleground. This portion of the solar array has been removed from the proposed Project and will not be present after Project construction.

³ The visual simulation for KOP 4 includes a portion of the solar array that has been removed from the proposed Project. As such, the proposed Project would be less visible than shown in Figure 8, Photograph 2.

⁴ When a transmission tower or conductor is located above background terrain or the horizon and extends into the viewed sky, it is said to be skylined or silhouetted.

⁵ The visual simulation for KOP 5 includes a portion of the solar array that has been removed from the proposed Project. As such, the proposed Project would be less visible than shown in Figure 9, Photograph 2.

with exposed tan soils and golden grasses, except where taller green vegetation in the middleground identifies residential areas. The lattice steel towers of a high-voltage powerline are visible in the middleground, as are the wood poles associated with local electrical distribution lines, with prominent rocky mountains in the distance.

As shown in the simulated view, the solar array presents as an indistinct horizontal linear feature in the middleground of the view. The existing high voltage transmission tower and wooden distribution lines remain the most visible man-made structure in the middleground of the view along Locust Avenue, and the distant mountains remain the most prominent visual features in the landscape.

3.2 Summary of Anticipated Visual Effects

As described above and illustrated in Figures 5 through 10, in most views, the proposed Project is minimally discernable in the landscape. When visible, the proposed Project solar array adds an industrial character to the landscape, but the degree of contrast introduced to the view is low. The proposed 230-kV substation and 230-kV gen-tie line also add industrial character, especially in views where the associated transmission structures are skylined, but the structures are similar in form to existing electrical infrastructures in the Project vicinity. Overall, the Project would not substantially degrade the existing visual character or quality of public views of the Project area and its surroundings.

Figure 5 KOP 1



Photograph 1. Existing view looking north-northeast toward the Project area from SR 247 near Holmes Road.



Photograph 2. Simulated view after construction of the proposed Project.

Figure 6 KOP 2



Photograph 1. Existing view looking southeast toward the Project area from SR 247 near Wilderness Road.



Photograph 2. Simulated view after construction of the proposed Project.

Figure 7 KOP 3



Photograph 1. Existing view looking north toward the Project area from SR 247 near Haynes Road.



Photograph 2. Simulated view after construction of the proposed Project.

Figure 8 KOP 4



Photograph 1. Existing view looking southeast toward the Project area from Northside Road between Meridian Road and Huff Road.



Photograph 2. Simulated view after construction of the proposed Project.

Figure 9 KOP 5



Photograph 1. Existing view looking southeast toward the Project area from Northside Road near Locust Avenue.



Photograph 2. Simulated view after construction of the proposed Project.

Figure 10 KOP 6



Photograph 1. Existing view looking north toward the Project area from Locust Avenue between Sunswep Drive and Wilshire Road.



Photograph 2. Simulated view after construction of the proposed Project.

4 References

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