

# Visual Resource Analysis for Solar Energy Zones in the San Luis Valley

## Final Report

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**VISUAL RESOURCE ANALYSIS FOR SOLAR ENERGY ZONES  
IN THE SAN LUIS VALLEY**

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## Executive Summary

This report summarizes the results of a study conducted by Argonne National Laboratory's (Argonne's) Environmental Science Division for the U.S. Department of the Interior Bureau of Land Management (BLM). The study analyzed the regional effects of potential visual impacts of solar energy development on three BLM-designated solar energy zones (SEZs) in the San Luis Valley (SLV) in Colorado, and, based on the analysis, made recommendations for or against regional compensatory mitigation to compensate residents and other stakeholders for the potential visual impacts to the SEZs. The analysis was conducted as part of the solar regional mitigation strategy (SRMS) task conducted by BLM Colorado with assistance from Argonne.

Two separate analyses were performed. The first analysis, referred to as the *VSA Analysis*, analyzed the potential visual impacts of solar energy development in the SEZs on nearby visually sensitive areas (VSAs), and, based on the impact analyses, made recommendations for or against regional compensatory mitigation. VSAs are locations for which some type of visual sensitivity has been identified, either because the location is an area of high scenic value or because it is a location from which people view the surrounding landscape and attach some level of importance or sensitivity to what is seen from the location. The VSA analysis included both BLM-administered lands in Colorado and in the Taos FO in New Mexico.

The second analysis, referred to as the *SEZ Analysis*, used BLM visual resource inventory (VRI) and other data on visual resources in the former Saguache and La Jara Field Offices (FOs), now contained within the San Luis Valley FO (SLFO), to determine whether the changes in scenic values that would result from the development of utility-scale solar energy facilities in the SEZs would affect the quality and quantity of valued scenic resources in the SLV region as a whole. If the regional effects were judged to be significant, regional compensatory mitigation was recommended. VRI data was not available for the Taos FO and it was not included in the SEZ analysis; the SEZ analysis includes BLM-administered lands in Colorado only.

### VSA Analysis Procedures and Results Summary

Four types of VSAs were included in the VSA analysis:

- *Communities* – Areas where people live and work;
- *Specially designated areas (SDAs)* – Areas that have received some level of designation by national, state, or local government for scenic values or scenic purposes, or have a non-scenic designation but are valued for their scenic resources;
- *Area of cultural importance to tribes* – Areas identified in ethnographic studies as containing landscape features important to one or more tribes in the region and having a visual setting component; and

- *Points of interest*; other areas with scenic importance or sensitivity not falling into the above categories.

VSAs within the SLV identified by BLM Colorado included those for which visual impacts were assessed in the BLM and the U.S. Department of Energy's *Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States* (Solar PEIS), and others identified by BLM staff as being potentially important to SLV residents and other stakeholders. Geographic information system (GIS)-based viewshed analysis was used to ensure that solar development within the SEZs would be at least theoretically visible from candidate VSAs. A total of 25 VSAs for which theoretical visibility of the SEZs was identified were included in the Colorado SRMS VSA impact and mitigation analysis.

The VSA impact and mitigation analysis was conducted in accordance with detailed instructions provided by BLM. Study activities consisted of compiling VSA background information, such as the visual sensitivity and human activities within each VSA; field observations of the SEZs from the VSAs; and office-based data processing and analysis tasks.

The field observations included photography, description of the viewed landscape using various data collection forms, and completion of a BLM Visual Contrast Rating form to predict the likely levels of visual contrast that viewers within the VSA would be exposed to as a result of the operation of photovoltaic and parabolic trough solar facilities within the SEZs, assuming the same 80% development scenario utilized for the Solar PEIS. The impact analysis considered the predicted contrast ratings but also the type, estimated numbers, and sensitivity of potential viewers of solar development; the length of time the projects would likely be viewed; the likelihood of glare and other transitory visual effects, the presence of existing human-made development in the view; and the compatibility of solar facilities with the existing landscape character.

Significant findings from the analysis include the following:

- Regional compensatory visual impact mitigation was recommended for the following community VSAs:
  - Moffat, to compensate for potential visual impacts from solar energy development in the De Tilla Gulch SEZ.
  - Romeo, to compensate for potential visual impacts from solar energy development in the Los Mogotes East SEZ.
- Regional compensatory visual impact mitigation was recommended for the following SDAs:

- Cumbres & Toltec Scenic Railway (a National Historic Landmark), to compensate for potential visual impacts from solar energy development in the Antonito Southeast SEZ.
- The Old Spanish National Historic Trail, to compensate for potential visual impacts from solar energy development in the De Tilla Gulch SEZ.
- Rio Grande del Norte National Monument, to compensate for potential visual impacts from solar energy development in the Antonito Southeast SEZ.
- Regional compensatory visual impact mitigation was recommended for the following points of interest:
  - U.S. Highway 285, to compensate for potential visual impacts from solar energy development in the De Tilla Gulch, Los Mogotes East, and Antonito Southeast SEZs.
  - The “Welcome to Colorful Colorado” Sign at New Mexico-Colorado state line, to compensate for potential visual impacts from solar energy development in the Antonito Southeast SEZ.
  - The West Fork of the North Branch of the Old Spanish Trail, to compensate for potential visual impacts from solar energy development in the Los Mogotes East and Antonito Southeast SEZs.

Potential visual impacts and mitigation recommendations for the VSAs are presented in Table ES-1.

Regional compensatory mitigation was not recommended for the remaining VSAs, primarily because the impact analysis predicted weak visual contrasts from solar development in the SEZs for the VSA in question, or because the estimated number of likely viewers of the SEZ from within the VSA was too low to classify the associated visual impact as substantial enough to warrant regional compensatory mitigation. It should be noted that for three areas of cultural importance to tribes (the Los Mogotes peaks, San Antonio Mountain, and Ute Mountain), despite the analysis predicting moderate or strong visual contrasts from solar development in the SEZs, and the likely sensitivity of some viewers, the estimated visitation to these VSAs was too low to classify the associated visual impact as substantial enough to warrant regional compensatory mitigation. However, the potential sensitivity of the area to tribes, and the sensitivity of tribal viewers could not be judged without more information than was available for the impact analysis. If these sensitivities are large, they potentially could justify regional compensatory mitigation. Similarly, Ute Mountain has been proposed for Congressional designation a wilderness area. If this designation occurs, the visual sensitivity of Ute Mountain will increase, potentially justifying regional compensatory mitigation.

**Table ES-1 VSA Visual Impact and Mitigation Summary**

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
Antonito	Community	Antonito Southeast	1.6	Weak	High	Moderate (residents), Moderate (vehicles)	Long (residents), Short (vehicles)	No	Overall visual contrast is weak because of extensive screening of SEZ by vegetation and structures.
Black Canyon WSA	SDA	De Tilla Gulch	9.7	Weak	High	Low	Long	No	Overall visual contrast is weak.
Center	Community	De Tilla Gulch	24.1	N/A	N/A	N/A	N/A	No	Field analysis indicates no visibility of SEZ from Center because of distance and screening by vegetation and structures.
Cerro de la Olla	Area of Tribal Importance within SDA	Antonito Southeast	17.1	Weak	High	Low	Long	No	Overall visual contrast is weak, and the estimated visitation to the VSA is too low to constitute significant visual impact.
Cumbres and Toltec Scenic Railroad	SDA	Antonito Southeast	1.5	Strong	High	High	Intermittent short-duration views during travel; extended views at KOP.	Yes	Strong contrasts for sensitive viewers seeking scenic views from nationally- and agency- designated scenic and historic resource.

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
La Jara	Community	Los Mogotes East	5.2	Weak	High (residents), Low to high (vehicles)	Moderate (residents), Very high (vehicles)	Long (residents), Short (vehicles)	No	Overall visual contrast is weak; view is screened from much of the community.
Liberty Trail	SDA	De Tilla Gulch	22.8	Weak	High	Moderate to high	Long	No	Overall visual contrast is weak.
Los Caminos Antiguos Scenic and Historic Byway	SDA	Los Mogotes East, Antonito Southeast	2.6 (Los Mogotes East), 1.6 (Antonito Southeast)	Weak to Moderate	Low to High	Very high	Short	No	Most stretches of Byway subject to weak or no contrasts, in part because of screening by vegetation and structures. Views with moderate contrasts would be short duration.

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
Los Mogotes Peaks	Area of Tribal Importance within SDA	Los Mogotes East, Antonito Southeast	8.4 (Los Mogotes East), 9.5 (Antonito Southeast)	Moderate (Los Mogotes East), Strong (Antonito Southeast)	High	Very low	Long	No	Despite moderate to strong visual contrast, and sensitivity of some viewers, the estimated visitation to the VSA is too low to constitute significant visual impact. However, the potential sensitivity of the area to tribes, and the sensitivity of tribal viewers cannot be judged without more information. If these sensitivities are large, they potentially could justify regional compensatory mitigation.
Manassa	Community	Los Mogotes East	5.1	Weak	High (residents), Low to high (vehicles)	Moderate (residents), Very high (vehicles)	Long (residents), Short (vehicles)	No	Overall visual contrast is weak; view is screened from much of the community.

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
Moffat	Community	De Tilla Gulch	7.7	Moderate	High (residents), Low to high (vehicles)	Low (residents), Very high (vehicles)	Long (residents), Short (vehicles)	Yes	Moderate contrasts in long-duration views for sensitive viewers (residents) in mostly natural-appearing landscape. Limited screening in community.
Old Spanish Trail	SDA	De Tilla Gulch	0.4	Strong	High	Low	Long	Yes	Strong contrasts for sensitive viewers on long stretch of nationally designated historic trail.
Rio Grande Del Norte NM	SDA	Antonito Southeast	<0.1	Strong	High	Low	Long	Yes	Strong contrasts for sensitive viewers in largely natural appearing landscape in northern portion of national monument. Limited screening.
Romeo/Veterans' Memorial	Community; Point of Interest	Los Mogotes East	2.9	Moderate	High (residents), Low to high (vehicles)	Moderate (residents), Very high (vehicles)	Long (residents), Moderate (vehicles)	Yes	Moderate contrasts in short-distance, long-duration views for sensitive viewers (residents); increased likelihood of glare.

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
San Antonio Mountain	Area of Tribal Importance	Antonito Southeast	9.5 (Antonito Southeast), 20.2 (Los Mogotes East)	Assumed strong at peak and on northeast-facing mountain slopes based on Google Earth analysis and comparison with Ute Mountain.	High	Low	Long	No	Despite strong contrast and high sensitivity of some viewers, the estimated visitation is too low to constitute significant visual impact. However, the potential sensitivity of the area to tribes, and the sensitivity of tribal viewers cannot be judged without more information. If these sensitivities are large, they potentially could justify regional compensatory mitigation.
San Antonio WSA	SDA	Antonito Southeast, Los Mogotes East	1.6 (Antonito Southeast), 11.1 (Los Mogotes East)	Strong	High	Very Low	Long	No	Estimated less than 12 visitors/year; too low to constitute significant visual impact.
San Antonio Mountain Wildlife Viewing Area	Point of Interest within SDA	Antonito Southeast	9.4	Weak	Low to High	High	Long	No	Overall visual contrast is weak. Most of the SEZ is screened by topography.

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
Sanford	Community	Los Mogotes East	7.3	Weak	High (residents), Low to high (vehicles)	Moderate (residents), Very high (vehicles)	Long (residents), Short (vehicles)	No	Overall visual contrast is weak.
San Luis Hills ACEC	SDA	Los Mogotes East, Antonito Southeast	9.5 (Los Mogotes East), 6.8 (Antonito Southeast)	Moderate to Strong	High	Very Low	Short to Moderate	No	Estimated less than 12 viewers/year; too low to constitute significant visual impact.
San Luis Hills WSA	SDA	Antonito Southeast, Los Mogotes East	6.2 (Antonito Southeast), 8.9 (Los Mogotes East)	Moderate	High	Very Low	Short to Long	No	Estimated less than 12 viewers/year; too low to constitute significant visual impact.
U.S. Highway 285	Major Highway with Portions in SDA	De Tilla Gulch, Los Mogotes East, Antonito Southeast	0.2 (De Tilla Gulch), 2.7 (Los Mogotes East), 0.0 (Antonito Southeast)	Strong	Low to High	Very High	Short to Long	Yes	Strong contrasts for two SEZs, moderate for the third. US285 passes through Antonito SE SEZ, and has very short distance views of De Tilla Gulch. Major highway through SLV, and major gateway to both ends of SLV.

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
Ute Mountain	Area of Tribal Importance within SDA	Antonito Southeast	11.3 (from Ute Mountain peak). 9.1 mi from substitute KOP.	Moderate to strong contrast as measured at KOP at base of mountain; assumed strong at peak and on northwest-facing mountain slopes.	High	Low	Long	No	Despite strong contrast and high sensitivity of some viewers, the estimated visitation is too low to constitute significant visual impact. However, the potential sensitivity of the area to tribes, and the sensitivity of tribal viewers cannot be judged without more information. If these sensitivities are large, they potentially could justify regional compensatory mitigation.
Valley View Hot Springs/Orient Land Trust	Community	De Tilla Gulch	9.7	Weak	High (residents), Low to high (vehicles)	High	Long	No	Overall visual contrast is weak.

VSA/KOP	VSA/KOP Type	Potentially Impacting SEZ(s)	Shortest Distance (Mi)	Overall Contrast Rating	Relative Viewer Sensitivity	Relative Viewer Numbers	Relative View Duration	Mitigation Recommended?	Rationale
“Welcome to Colorful Colorado” Sign at New Mexico-Colorado State Line	Point of Interest	Antonito Southeast	11.0 (Los Mogotes East), < 0.1 (Antonito Southeast)	Strong	Low to High	Very High	Moderate to Long	Yes	Strong contrasts in very short distance view, with SEZ stretching across most of view. The Colorado welcome sign is a popular tourist destination for brief stops. KOP is also sensitive because it is where a large number of visitors form their first visual impression of both Colorado and the SLV.
West Fork of the North Branch of the Old Spanish Trail	Point of Interest	Los Mogotes East, Antonito Southeast	0.3 (Los Mogotes East), 0.3 (Antonito Southeast)	Strong	High	Low	Long	Yes	Strong contrasts from short-distance views of two SEZs, large cumulative impacts. Current use very low, but assuming that designation would increase the number of sensitive viewers substantially, mitigation is recommended.

## SEZ Analysis Procedures and Results Summary

As directed by detailed instructions provided by BLM, four separate evaluations were conducted as part of the SEZ analysis:

1. The general regional condition and trends of the visual resource within the region (as reflected in the visual resource inventory) were determined, and the changes in visual values for each SEZ were evaluated in the context of the regional condition and trend;
2. The relative scarcity of scenic quality and scenic quality component scores in the region was assessed, and the changes in visual values for each SEZ resulting from solar development were evaluated in the context of the scarcity of scenic quality in the region as a whole;
3. The resilience of the visual resource within the region was identified; and
4. The compatibility of solar development in the SEZs with the land use planning objectives for the SEZ areas, as expressed by the visual resource management classes (VRM classes) identified for the areas, was determined.

A finding that the changes to the visual values for the SEZs, as determined by items 1, 2, *or* 4, are significant on a regional basis would indicate potential warrant for regional compensatory mitigation, with item 3 (resilience) informing the analysis. Warrant for regional compensatory mitigation was determined for each SEZ separately.

The results of the SEZ analysis can be summarized as follows:

**Regional visual resource condition and trend:** The current condition of both BLM and non-BLM lands in the SLV indicates substantial degradation of scenic quality in the region, and the expected trend is toward further development, indicating greater losses to visual resources in the SLV in the future.

**Regional scenic quality scarcity:** High scenic quality is considered very scarce within the inventoried portion of the region, while moderate and low scenic quality is common.

**Regional sensitivity scarcity:** The majority of the region was determined to have high sensitivity.

**Regional distance zone scarcity:** Nearly all inventoried lands (90%) are within the BLM foreground-middleground zone of 0-5 mi.

**Resilience:** Resilience of the SEZ landscapes is low. Because of the open and treeless nature of the SEZs and their relatively uniform colors and textures, visual absorption capability is also low.

Regional and SEZ-specific analysis results and regional compensatory mitigation recommendations are as follows:

**De Tilla Gulch SEZ:** In light of the substantial current loss and the likely continued loss of the remaining scenic values of the SLV, as well as the likely non-conformance with the visual management objectives for the De Tilla Gulch SEZ area in the former Saguache FO RMP (now contained within the SLFO), the changes to visual values of the De Tilla Gulch SEZ are judged to be regionally significant, and regional compensatory mitigation is recommended.

**Los Mogotes East SEZ:** In light of the substantial current loss and the likely continued loss of the remaining scenic values of the SLV, as well as the likely non-conformance with the visual management objectives for the Los Mogotes East SEZ area in the La Jara FO RMP (now contained within the SLFO), the changes to visual values of the Los Mogotes East SEZ are judged to be regionally significant, and regional compensatory mitigation is recommended.

**Antonito Southeast SEZ:** In light of the substantial current loss and the likely continued loss of the remaining scenic values of the SLV, the changes to visual values of the Antonito Southeast SEZ are judged to be regionally significant, and regional compensatory mitigation is recommended.

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## 1 INTRODUCTION

### 1.1 Need and Purpose for Analysis

Recent years have seen the rapid development of energy facilities in the western United States, especially utility-scale renewable energy projects and associated electric transmission lines, that because of their size and unique visual characteristics may cause large visual impacts at long distances (Sullivan and Abplanalp 2013; Sullivan et al. 2012a, 2012b; Sullivan et al. 2014). In some instances, renewable energy and transmission projects may cause large impacts to high-value scenic resource areas such as national parks, and other visually sensitive areas, such as residential areas and other communities. However, visual impacts from renewable energy and transmission projects are not limited to scenic resources. Renewable energy projects and transmission lines have been built, or are proposed to be built, in or near lands with visually sensitive cultural resources, which in some cases could be subjected to large visual impacts as a result.

The Solar Energy Development Programmatic Environmental Impact Statement (Solar PEIS) developed by the U.S. Department of Energy (DOE) and the U.S. Department of the Interior Bureau of Land Management (BLM) established that utility-scale solar energy development on BLM-administered lands could potentially result in large visual impacts to nearby communities, tribal lands, specially designated areas, and other visually sensitive areas (VSAs) from which there may be views of solar development (DOE and BLM 2012). The PEIS stated that while visual impact mitigation actions and best management practices could reduce the visual impacts from solar energy development, because of large size and unique visual characteristics of utility-scale solar energy facilities, strong visual contrast may be caused by these facilities regardless of mitigation, and unavoidable adverse impacts could result. The PEIS further noted that offsite mitigation may be appropriate in some circumstances.

The Secretary of the Interior has issued various orders requiring development and application of a landscape-scale approach to land management for Federally-managed lands within the Department. As part of their response to the requirements in these orders, the BLM has developed a protocol for determining if regional compensatory mitigation is required in response to potential environmental impacts (including visual resource impacts) from utility-scale solar energy development on certain BLM-administered lands (solar energy zones, or SEZs) in the western U.S. (BLM 2014a). This protocol is applied as part of what is referred to as a solar regional mitigation strategy (SRMS).

This report describes the visual resource analysis conducted by Argonne National Laboratory's (Argonne's) Environmental Science Division for the purpose of identifying regional

compensatory mitigation potentially required for solar energy development within three solar energy zones (SEZs) in the San Luis Valley in south central Colorado.

Visual impact includes both the change to the visual qualities of the landscape resulting from the introduction of visual contrasts, and the change to the human visual experience of the landscape that results from viewing the contrasting elements in the landscape setting (Sullivan and Meyer 2014). Visual impact assessment identifies the effects of the predicted visual contrasts on the visual qualities and character of the landscape and the perceptions of viewers likely to see the project. Therefore, there are two visual impact components to assess when identifying residual impacts to visual resources resulting from solar energy development in the SEZs:

1. Potential visual impacts on views from communities, tribal lands, specially designated areas, and other visually sensitive areas (VSAs) from which there may be views of solar development within the SEZ; and
2. The potential reduction of visual resource values within the boundary of the SEZ (referred to in this report as the SEZ analysis).

Visual impacts of either type may warrant regional offsite mitigation, and both types of potential visual impacts must be assessed in order to determine if offsite regional mitigation is warranted, and to determine the nature and extent of offsite mitigation if it is required (BLM 2014a).

## **1.2 Scope**

This report describes the VSA and SEZ analyses conducted for the De Tilla Gulch, Los Mogotes East, and Antonito Southeast SEZs in the San Luis Valley in Colorado.

The VSA section of the report (Sections 1-3) discusses potential visual impacts to 22 VSAs identified by BLM staff, on the basis of viewshed analyses conducted by Argonne, as discussed in Section 2.2. Potential impacts to selected other areas within the San Luis Valley are discussed in Appendix C, and also in the Solar PEIS.

Potential visual impacts were analyzed for solar photovoltaic (PV) and parabolic trough facilities only, as per direction from BLM. As for the Solar PEIS, the impact analysis assumed an 80% development scenario for the SEZs, i.e., 80% of the area of the SEZ would be occupied by solar facilities. Based on research conducted for the Solar PEIS, a maximum structure height for PV facilities was assumed to be 7.4 m (24.6 ft), and for parabolic trough facilities, a maximum structure height was assumed to be 11.6 m (38 ft).

The SEZ section of the report (Section 4) discusses the warrant for regional compensatory mitigation for negative effects on the visual resources of the SLV region, based on the potential

visual impacts of solar energy development that would occur within the three Colorado SEZs themselves. Data that would be required for the SEZ analysis were not available for the Taos FO, thus the Taos FO portion of the SLV region was not included in the SEZ analysis.

### **1.3 Intended Use and Users**

This report is intended to inform the BLM and other SLV stakeholders of potential visual impacts resulting from changes in visual values resulting from solar development within the SEZs. The results of the analysis will inform the BLM's decisions with respect to the warrant for, and potentially the nature and location of, regional compensatory mitigation that may be found to be appropriate.

### **1.4 Document Organization**

Sections 1-3 discuss the VSA Analysis methods and results. After briefly describing the approach used for analyzing impacts and determining if regional offsite visual impact mitigation is required, the discussion focuses on potential impacts to each of the VSAs. The VSA impact analyses are generally organized by the relevant SEZ, i.e., the SEZ where solar development could potentially impact the VSA, in the following order: De Tilla Gulch SEZ, Los Mogotes East SEZ, and Antonito Southeast SEZ.

Section 4 discusses the SEZ analysis methods and results.

Appendices provide the following:

1. Visual Contrast Rating forms for the contrast ratings conducted as part of the VSA analysis (Appendix A);
2. Visual contrast rating degree of contrast criteria and environmental factors descriptions considered in the contrast rating for the VSA analysis (Appendix B); and
3. Additional informal visual impact information relevant to potential solar development in the San Luis Valley of Colorado (Appendix C).

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## 2 VSA ANALYSIS METHODOLOGY

### 2.1 General Methodology

The VSA analysis uses methods similar to those used in standard visual impact analyses for utility-scale energy projects on federally managed lands in the United States (Sullivan and Meyer 2014). Detailed direction and methods specification for the VSA analysis are contained in Appendix F of the BLM's *Draft Procedural Guidance for Developing Solar Regional Mitigation Strategies* (BLM 2014a), but are summarized as follows:

1. Identifying and selecting for analysis VSAs within the viewshed of the SEZ that may be affected by solar energy development within the SEZ;
2. Identifying and describing likely viewers of solar development within the SEZ, that is, describing the types of people who would likely be in each VSA;
3. Identifying and describing key observation points (KOPs) within each VSA from which people would be likely to view the proposed project;
4. Describing the visual properties of the solar development within the SEZ, and the types and sources of visual contrast associated with the development that are predicted to be observed by viewers within the VSA ;
5. Preparing a visual simulation of the proposed project (in this case a simplified visualization of multiple models of solar facilities within the SEZ using Google Earth software);
6. Describing the effects of the visual contrasts of the project on the view from the KOP or KOPs within the VSA;
7. Describing the potential impacts of the changed view on viewers within the VSA, considering the magnitude of the change to the view, the numbers and sensitivity of the viewers, and the likely duration of the views. This is the final determination of visual impact from the project on the visually sensitive area;
8. Discussing potential cumulative visual impacts for those VSAs with views of more than one SEZ; and
9. On the basis of the impact analysis, recommending whether or not regional compensatory mitigation is warranted.

### 2.2 VSA Identification and Selection

GIS-based viewshed analyses were conducted for each SEZ, assuming a solar technology height of 11.6 m (38 ft.), the assumed approximate maximum height of structures associated with solar parabolic trough facilities, the taller of the two solar technologies for which impacts were analyzed in the VSA Analysis. Viewshed analysis distance limits were set to 25 mi (40 km), consistent with the distances used in the Solar PEIS.

The viewshed analyses identified lands from which there potentially would be views of solar development within the SEZ. Based on their knowledge of the area and available GIS data showing the locations of potential VSAs, BLM renewable energy staff and subject matter experts identified VSAs for inclusion in the VSA analysis, and selected KOPs within or near the VSAs to serve as points from which to judge the likely visual contrast levels that would be expected for viewers within the VSA.

In some cases, specific locations were identified within the VSA where people were known to congregate and from where viewers would likely see solar development within the SEZ; these KOPs are referred to in this report as *critical KOPs*. In other cases, no specific points within the VSA where people might congregate were known, for example, in the Flat Top Area of Critical Environmental Concern (ACEC), and in these cases a *representative KOP* was identified for the analysis; these points were selected to be representative of the general view of solar development within the SEZ as it would be seen by viewers in the VSA.

After identifying the KOPs, the KOP locations were exported to a GIS software package, *GIS Pro* (from Garafa Inc.), available on an Apple iPad mobile device. *GIS Pro* was used for navigation, distance determination, and data recording in the field.

### **2.3 Field Assessment: Landscape Description and Visual Contrast Assessment**

Field assessments were conducted in August and October 2014 for the purpose of assessing potential visual contrasts that would be predicted for each KOP. For the August fieldwork, observations were made by a three person team consisting of a local BLM renewable energy staff member and two visual resource analysts from Argonne. The BLM staff member had received BLM VRM training. The Argonne visual resource analysts are trained in data collection for visual resource analysis studies using the various data collection forms employed for this study, which are discussed below. For the August fieldwork, a total of 18 observations were conducted between August 11th and August 14<sup>th</sup>. For the October fieldwork, a total of 6 observations were made between October 6<sup>th</sup> and October 10<sup>th</sup>. It should be noted that visibility conditions during the October fieldwork were sometimes poor, because of forest fires near the SLV.

After driving or hiking to each KOP using its pre-determined coordinates for navigation purposes, the analysts determined the actual coordinates used for the observation using the iPad's global positioning system (GPS) positioning capability. At each KOP, two data collection forms were used to record study data: a description of the landscape containing the SEZ was recorded using a National Park Service (NPS) Scenery Conservation System (SCS) *View Description and Scenic Quality Form*, and the observed visual contrast was recorded using a BLM *Visual Contrast Rating Worksheet*. Copies of the completed forms for the SRMS project are available from BLM upon request.

#### *View Description and Scenic Quality Form*

The *View Description and Scenic Quality Form* is a form used by NPS to inventory scenic resource using a view-based approach. Because the SRMS visual analysis concerns impacts to specific views from KOPs, the *View Description and Scenic Quality Form* is well suited to describing visible landscape elements and other descriptive data that are relevant to the SRMS visual resource analysis.

Data recorded on the *View Description and Scenic Quality Form* included weather conditions; KOP name; data recorder names; GPS coordinates for the KOP; observer position with respect to the SEZ (vertical angle of view); view direction and bearing; horizontal width of field for the view; a record of photographs taken; landscape view type (panoramic, feature, etc.); landscape character type (natural appearing, agricultural, rural etc.); distance zones; visible landforms, land cover, land uses, and structures; prominent design elements (forms, lines, colors, and textures); a view description; and a scenic quality rating, based on three factors: landscape character integrity, vividness, and visual harmony. *GIS Pro* software (discussed above) was used to record the KOP location in a GIS application, and the iPhone/iPad app *Theodolite Pro* (Hunter Research and Technology) was used to determine approximate bearings of views toward the SEZ.

#### *BLM Visual Contrast Rating Worksheet*

BLM *Visual Contrast Rating Worksheets* were completed for the views from the KOPs toward the SEZs. The BLM's visual contrast rating system is a systematic process used to analyze potential visual impact of proposed projects and activities on BLM-administered lands (BLM 1986). Using procedures established by BLM, the team predicted the degree of contrast between the solar facilities in the SEZs (assuming 80% buildout) and the existing landscapes as *strong*, *moderate*, *weak*, or *none* for each of four design elements: form, line, color, and texture. Printouts of Google Earth views of the SEZs with wireframe models of hypothetical solar facilities at various locations in the SEZ were used in the field to simulate views from the KOPs, as visualization aids. While they were not photorealistic renderings of solar facilities, the Google Earth views helped the analysts to understand the potential size and angle of view to the hypothetical solar facilities as they might appear for viewers at the KOP. As an additional visualization aid in the field, printed photographs of real solar facilities at various distances

angles of view were used to help the analysts understand how distance, lighting, and viewing angles would affect the appearance of real solar facilities in the SEZ.

In addition to recording data on the various study forms, each observation included photography of the facility and its surroundings. At each daytime observation point, a series of panoramic photos were taken using an iPhone, and the panoramic photos were stitched into a single panoramic image “on the fly” using *Autostitch* (Cloudburst Research Inc.), a photography app available for the iPhone. In addition, a series of single-frame high-resolution photos were taken of the facility using a Nikon D7000 digital single lens reflex camera with an 18–300 mm zoom lens.

## **2.4 Impact Assessment and Regional Compensatory Mitigation Recommendation**

The contrast rating was the primary (but not the sole element) influencing the decision to recommend compensatory offsite mitigation. If a contrast rating did not predict at least moderate levels of contrast from solar facilities within the SEZ, regional compensatory offsite mitigation was not recommended; however, several factors besides visual contrast were considered in predicting the visual impact to the VSA from solar facilities in the SEZ. As per the BLM VCR Manual (BLM 1986), the impact analysis considered multiple factors, including consideration of the following ten visibility factors:

- Distance,
- Angle of observation,
- Length of time the project is in view,
- Relative size or scale,
- Season of use,
- Light conditions,
- Recovery time,
- Spatial relationships,
- Atmospheric conditions, and
- Motion.

In addition, as per the BLM SRMS guidance (BLM 2014a), the amount of the SEZ that would be visible from the VSA, the amount of the VSA that would have views of the SEZ, the importance of the potentially affected area of the VSA, the number of potential viewers at the KOP or within the affected areas of the VSA, the types of activities they would be engaged in in the affected area of the VSA, and their likely level of sensitivity to the visual impacts of the solar facilities were also considered in the impact assessment. The recommendation for regional compensatory mitigation was a professional judgement made by the analyst in consideration of all of the factors analyzed in the impact assessment.

### 3 VSA ANALYSES

#### 3.1 Community of Center

##### 3.1.1 VSA Description

*VSA Type:* Community

*Potentially Impacting SEZ:* De Tilla Gulch SEZ

*Distance from SEZ to Affected Area within VSA:* Approx. 24.1 mi from closest point in VSA to closest point in the SEZ. Approx. 26.1 mi from closest point in VSA to farthest point in the SEZ. See Figure 3.1-1.

*Affected Area within the VSA:* The SEZ is located on a slight southeast-facing slope, northeast of Center. Without screening by vegetation and structures, solar facilities within the SEZ could theoretically be visible from any location within or near Center; however, a field visit in August 2014 showed there is no view of the SEZ from Center or nearby locations due to screening by vegetation<sup>1</sup> and structures north of Center.

*Estimated Annual Visitation/Usage in VSA:* The population of Center is 2,230 people (US Census 2010). In addition, large numbers of persons pass through Center while driving. CDOT (2013) estimates that up to 4,500 vehicles per day travel through Center on CO 112A. At an average of 1.55 persons/vehicle<sup>2</sup>, total annual views of the SEZ from vehicles are approximately 2.5 million, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

*Types of Activities within the Affected Area:* Driving, walking, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that 4,500 vehicles per day travel on CO 112A through Center. The population of Center is 2,230 people (US Census 2010). Thus, the vast majority of viewers would be in vehicles.

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<sup>1</sup> The amount of screening provided by deciduous trees and shrubs varies seasonally, and is typically reduced when these plants do not have leaves (referred to as “leaf-off” conditions), i.e., in late fall, winter, and early spring. In some locations, such as in riparian areas, vegetation density may be sufficient to provide screening even during leaf-off conditions.

<sup>2</sup> 2011 average vehicle occupancy of 1.55 persons per vehicle. (University of Michigan, Center for Sustainable Systems).

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* No master plan was found for Center. Currently, the affected area of Center is in residential use.

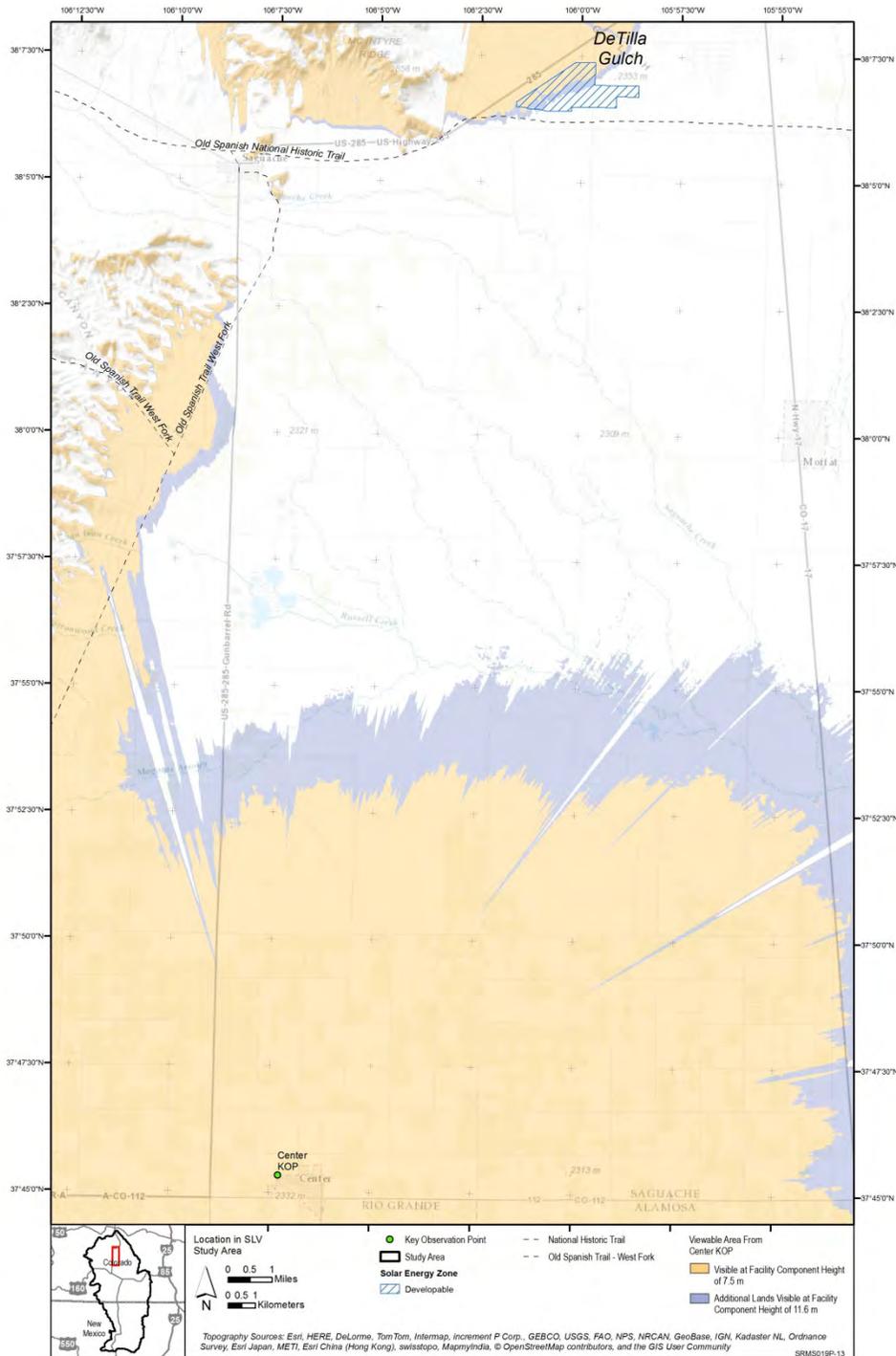


Figure 3.1-1: Viewshed from Community of Center KOP Including De Tilla Gulch SEZ

### 3.1.2 KOP Description

*KOP Name:* Center

*KOP Location:* The Center KOP is located near the intersection of 1<sup>st</sup> Street and Washington Way. See Figure 3.1-1.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* Representative view towards De Tilla Gulch SEZ from Center and nearby areas.

*KOP Access Modes:* Automobile, truck, and foot.

### 3.1.3 Visual Context

*General Description:* Looking northeast towards De Tilla Gulch SEZ from the northern edge of Center, onto a panoramic view of the northern portion of the San Luis Valley. View of an agricultural/pastoral landscape with scattered ranches and trees, with a mountain ridge in the distant background. See Figure 3.1-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes and other community buildings, farm structures, fences, agricultural fields, roads, utility lines, ditches, road signage.

*Direction of View toward SEZ:* Northeast

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Less than 1%. Scattered ranches and vegetation screen views of the De Tilla Gulch SEZ from Center. See Figure 3.1-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* Regardless of screening by vegetation and structures, views of the southeastern portion of the SEZ from Center would be screened by topography. The northwestern portion of the De Tilla Gulch SEZ is within the theoretical GIS-calculated viewshed of the KOP; however, scattered trees and shrubs screen views between Center and the SEZ.

*Orientation of the solar energy development within the field of view:* The SEZ is not visible from the KOP.



**Figure 3.1-2 Photograph of Existing Landscape from Center KOP Looking toward De Tilla Gulch SEZ. Note Distortion from Extremely Wide Angle of View.**



**Figure 3.1-3 Google Earth Schematic Visualization of De Tilla Gulch SEZ as Seen from Center KOP**

### 3.1.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation and Closest VRM Class:* During the field visit to the Center KOP, it was determined that the SEZ was not visible from the KOP or nearby areas, thus a BLM visual contrast rating could not be conducted.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* **NOTE:** The August 2014 field visit showed no visibility of the SEZ from Center because of screening by vegetation and structures. During “leaf off” periods (late fall – early spring) it is theoretically possible that solar facilities within the SEZ would be visible from Center, but it would be very unlikely, because of screening by structures and the woody portions of deciduous vegetation, as well as the leaves of evergreen vegetation. Nonetheless, because of the theoretical possibility of visibility during leaf-off conditions, the following discussion of visibility factors assumes that there would be visibility of solar facilities within the SEZ.

- **Distance.** Solar development within the SEZ could theoretically be visible between 24 and 26 miles from Center. At this distance, even without the screening that is present, any visible facilities within the SEZ would be very small in apparent size, with no surface details visible, and under normal lighting conditions would be very difficult to distinguish from background elements.
- **Angle of Observation.** The SEZ is on a slight slope that rises toward the northwest, such that the northwestern edge is tilted slightly upward toward the viewer. Without screening, this would slightly increase visibility of solar facilities within the SEZ; however, the angle of view is still very low. Because of the distance and low angle of view, even without the screening that is present, persons not familiar with the nature of the SEZ and its location would not recognize it as consisting of solar facilities.
- **Length of Time the Project Is In View.** Without the screening from vegetation and structures between Center and the SEZ, for residents and visitors to Center, views could be extended; for residents, solar developments in the SEZ would be visible on a daily basis, in some cases from resident’s yards, and from some streets in town. For persons driving local roads, visibility would be brief, typically a few minutes, depending on route and location.
- **Relative Size or Scale.** Even without the screening that is present, buildings within the SEZ would be far enough away that they would blend very well with existing structures and could not be distinguished as separate structures. Because of the very low viewing angle, the apparent size of the SEZ would be greatly reduced, and it would spread across a very small portion of the horizontal field of view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, the color of solar facilities within the SEZ would contrast

strongly with existing vegetation (generally tan or green depending on season) regardless of season of use; however, even without the screening that is present, at a distance of 24-26 mi, the color contrast would not likely be visible. Contrast might be stronger when snow is on the ground, particularly for PV facilities, which have black panels, but again, the perceived contrast would be minimal at 24-26 mi. Because of the open nature of the landscape between Center and the SEZ, the presence of structures, and because some foreground vegetation is evergreen, defoliation of trees in the fall is not likely to reveal solar development in the SEZ, but it is possible that screening might be sufficiently reduced to allow partial visibility of solar facilities within the SEZ. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially, but at the very long distance between Center and the SEZ, if plumes were visible above the screening, they would be very small in apparent size and very difficult to see.

- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because Center is south of the SEZ, without the screening that is present, there might sometimes be glare visible from solar facilities within the SEZ, but at a distance of 24-26 mi, would not likely be perceived as annoyingly bright.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. At a distance of 24-26 mi, facility lighting would be faint, and would likely blend in very well with existing lights visible in areas near the SEZ.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** If there were no screening elements between Center and the SEZ, solar facilities within the SEZ would be observed from a very low vertical angle of view across the base of a very distant low ridge. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ. Because of the

long distance between Center and the SEZ, atmospheric haze could sometimes be a significant factor in obscuring visibility of facilities within the SEZ, even if there were no screening elements between Center and the SEZ.

- **Motion.** The motion of water vapor plumes from parabolic trough facilities could increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low. There is a slight chance residents may see glare or plumes associated with solar development above the existing screening elements, but they likely would be very difficult to distinguish at a distance of 24-26 mi.

### 3.1.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Center is a small community in a rural area with substantial views of largely rural and natural-appearing landscapes. If screening between Center and the SEZ were absent, residents of Center could potentially see solar development within the SEZ or plumes associated with cooling mechanisms, or would be subject to glare, anytime they look to the northeast from the northern edge of Center or drive through the local area. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Some residents might find the view of industrial-scale solar facilities unattractive and inappropriate.

*Summary of level of visual exposure based on the representative VRM class objective:* If there were no screening between Center and the SEZ, solar development in the SEZ would be visible to persons in the northern portions of Center with unobstructed views looking directly at the SEZ, but because of the distance to the SEZ, the very small apparent width of the SEZ, the low height of the facilities, the very low angle of view, the facilities would almost certainly be missed by most casual observers. This would particularly be true if development was limited to PV facilities, but still likely if parabolic trough facilities were located within the SEZ. With the existing screening, it is very unlikely that the SEZ would be visible at all.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* The residents of Center would be considered to be sensitive viewers; however, because of the distance to the SEZ, the partial visibility of the SEZ, the very small apparent size of the SEZ, and the low viewing angle, even without the screening elements (structures and vegetation) between Center and the SEZ, solar facilities within the SEZ would be very difficult to see under normal viewing conditions. Expected visual contrast would be weak. With the existing screening, it is very unlikely that the SEZ would be visible at all from Center, and expected visual contrast would be negligible, as it would likely be limited to very small and faintly visible plumes visible under certain atmospheric conditions.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Because Center does not have an unobstructed view of either the Antonito Southeast or Los Mogotes East SEZs, no cumulative visual impacts from solar development within these SEZs is anticipated for viewpoints in or near Center.

### **3.1.6 Regional Compensatory Mitigation Recommendation**

Because of screening by buildings and vegetation, solar energy development in the De Tilla Gulch SEZ would not likely be visible from Center, except possibly for very small plumes faintly visible at certain times. Solar development in the De Tilla Gulch SEZ would be expected to create negligible visual contrasts overall. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur in the community of Center as a result of solar development in the De Tilla Gulch SEZ.

## 3.2 De Tilla North KOP (Representative KOP for U.S. 285)

### 3.2.1 VSA Description

*VSA Type:* Point of Interest

*Potentially Impacting SEZ:* DeTilla Gulch SEZ

*Distance from SEZ to Affected Area within VSA:* The De Tilla North KOP is located approximately 0.4 mi north of the northeastern corner of the De Tilla Gulch SEZ. It is approximately 2.1 mi from the KOP to the farthest point in the SEZ.

*Affected Area within the VSA:* Approximately 6.5 mi of U.S. 285 are within the GIS-calculated viewshed of the SEZ.

*Estimated Annual Visitation/Usage in VSA:* CDOT estimates that as many as 1,600 vehicles travel on U.S. 285 past the De Tilla Gulch SEZ every day. There are also numerous local roads in the area. At an average of 1.55 persons/vehicle, total annual views of the SEZ from vehicles travelling on U.S. 285 are approximately 1.6 million, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

*Types of Activities within the Affected Area:* Driving, ranching, farming, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that as many as 1,600 vehicles travel on U.S. 285 past the De Tilla Gulch SEZ every day. Therefore, more than 99% of viewers would be drivers or passengers in vehicles travelling through the area on U.S. 285. The remainder would primarily be permanent residents or farm or ranch hands, or others traveling local roads.

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* U.S. 285 is a major travel route through the SLV, and at the northern end of the valley it serves as a “gateway” to the SLV. Many visitors to the SLV enter the valley on U.S. 285, and the view from U.S. 285 is where their first visual impressions of the SLV are formed.

### 3.2.2 KOP Description

*KOP Name:* De Tilla North

*KOP Location:* The De Tilla North KOP is located at mile marker 95 on U.S. 285. The KOP is near the point of closest approach of U.S. 285 to the SEZ. Approximately 6.5 mi of U.S. 285 are within the GIS-calculated viewshed of the SEZ, and the majority of this stretch of the highway is north and northeast of the SEZ, as shown in Figure 3.2-1.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The De Tilla North KOP is a representative viewpoint for assessing the impact of the closest approach of U.S. 285 to the De Tilla Gulch SEZ. It offers an unobstructed panoramic view of the De Tilla Gulch SEZ from a high point overlooking the San Luis Valley to the south.

*KOP Access Modes:* Automobile and truck.

### 3.2.3 Visual Context

*General Description:* Representative view of drive along U.S. 285 and other roads in the vicinity of the De Tilla Gulch SEZ. De Tilla North KOP offers a panoramic view of San Luis Valley, looking out onto a southern sloping valley floor with a mix of agricultural and pastoral uses, bounded by mountains to the east and west. See Figure 3.2-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, fences, agricultural fields, grazing land, transmission lines, roads, and a landfill.

*Direction of View toward SEZ:* South

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* 102° See Figure 3.2-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire De Tilla Gulch SEZ is within the GIS-calculated viewshed of the KOP.

*Orientation of the solar energy development within the field of view:* The De Tilla Gulch SEZ would be seen close to the southern side of U.S. 285 for travelers on U.S. 285; on the left side of the highway for southbound travelers, and on the right side of the highway for northbound travelers. It occupies the center of the view toward the south, a common viewing direction for southbound travelers as they round a bend in the highway, opening up expansive view of the San Luis Valley previously screened from view by the foothills of the San Juan Mountains.

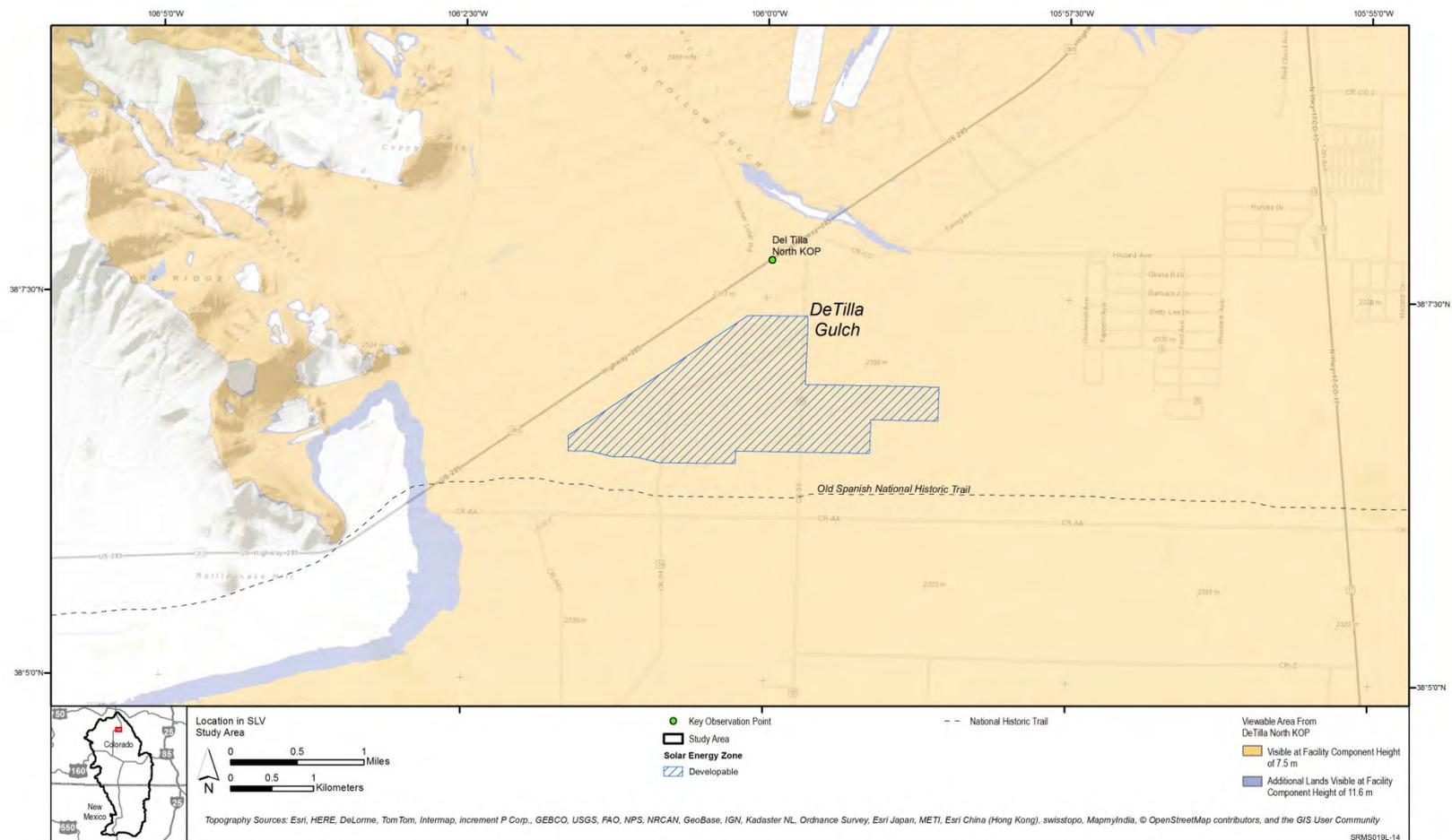


Figure 3.2-1 Viewshed from the De Tilla North KOP and De Tilla Gulch SEZ



**Figure 3.2-2 Photograph of Existing Landscape from De Tilla North KOP Looking toward De Tilla Gulch SEZ. Note Distortion from Extremely Wide Angle of View.**



**Figure 3.2-3 Google Earth Schematic Visualization of De Tilla Gulch SEZ as Seen from De Tilla North KOP. Because of Relatively Short Distance to SEZ, Only a Portion of the SEZ Is Visible.**

### 3.2.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation and Closest VRM Class:* A BLM visual contrast rating was conducted for the De Tilla North KOP on August 14, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.2-1.

**Table 3.2-1 Visual Contrast Rating for De Tilla North KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√	√				√			
	Line				√	√				√			
	Color				√	√				√			
	Texture				√	√				√			

The overall contrast rating for the De Tilla North KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast demands attention, will not be overlooked, and is dominant in the landscape.*” This corresponds most closely to the VRM Class IV objective, under normal lighting circumstances, regardless of solar technology type. The VRM Class IV objective from Manual 8431 is “*...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.*”

The presence of parabolic trough facilities within the SEZ would result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources, as they would be relatively close to the viewer and visually prominent.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the De Tilla Gulch SEZ would be visible between 0.4 mi and 2.1 mi from the De Tilla North KOP. This distance is within the BLM foreground-middleground distance zone and is close enough that the surface details of structures within the SEZ would be visible. Solar collector/reflectors would be seen as individual elements in the immediate foreground and as a block of color nearing the middleground.
- **Angle of Observation.** The KOP (and U.S. 285 generally) is slightly elevated with respect to the SEZ, which would make the size and artificial-appearing geometry of solar facilities more apparent. Because of the relatively short distance between the highway and the SEZ, the slight elevation difference has a more pronounced effect than at longer distances.
- **Length of Time the Project Is In View.** For residents in the vicinity, solar development in the SEZ would be visible on a daily basis. For persons driving in either direction on U.S. 285, development within the SEZ would be visible for up to approximately 6 ½ minutes. Northbound travelers would have the SEZ within view for about 3 ½ minutes before passing it, while southbound travelers would have the SEZ in view for about 5 ½ minutes. For persons travelling on other local roads, visibility would be brief, typically a few minutes depending on route and location.
- **Relative Size or Scale.** Because of the relatively short distance between the KOP (and U.S. 285 generally within the viewshed), the solar array for either PV or parabolic trough facilities would be seen as a very large, visually complex surface that would be out of scale with other objects in the view, and would extend across nearly the entire view looking south from U.S. 285. Cooling towers, steam turbine generators, and other structures associated with parabolic trough facilities could appear to be taller and larger than other structures in the area, which generally appear small in size.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Because of the open nature of the landscape between U.S. 285 and the SEZ, defoliation of trees in the fall would have no effect on views of solar development in the SEZ. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Because of the close approach of U.S. 285 to the SEZ, the appearance of the facilities within the SEZ would change dramatically as travelers approached and then passed the SEZ, with the visual patterns, apparent colors, and reflectivity of facility surfaces subject to large changes in the space of a few seconds.

Solar facilities can and routinely do cause glare that may be visible for very long distances. Because U.S. 285 is north of the SEZ, incidence of glare from the collector array would be substantially reduced for PV facilities, but might still be observed from parabolic trough arrays. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause strong visual contrasts at night.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZ would be viewed at short distance from a slightly elevated position. They would typically be viewed off to the side of the roadway from a vehicle moving at high speed. The viewing angle would change rapidly over the space of a few minutes, causing noticeable changes in the appearance of facilities within the SEZ.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ. However, atmospheric conditions are not expected to greatly affect facility visibility for persons travelling on U.S. 285 or local roads in the immediate vicinity because of the short distance to the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities could increase facility visibility under certain atmospheric conditions, particularly when air temperatures are low.

### 3.2.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the VSA:* U.S. 285 is a major thoroughfare through the SLV, and while it is traveled by a wide variety of people for various practical and recreation purposes, it is a primary route for tourists entering the SLV from the north. For visitors entering the SLV from the north on U.S. 285, the area around the SEZ is sensitive because it is located just at the point where an expansive view of the SLV opens up. In effect, this is where some of the visitors' first impressions of the landscape character of the SLV are formed. While there is some limited development visible in the viewshed, the landscape character is agricultural/pastoral, with a wide view of an open, generally uncluttered, and vast shrubland. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Tourists, other SLV visitors, and residents might find the "close-up" view of industrial-scale solar facilities to be unattractive, and feel that it creates an inappropriate impression of the SLV's character.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar facilities within the SEZ could not be missed by casual observers at the KOP or on the nearby stretch of U.S. 285, regardless of the type of solar technology. For the few minutes it would take to approach and pass the SEZ, it would dominate the view, attracting and holding visual attention. If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents could make them contrast more strongly than if only PV facilities were located in the SEZ.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Travelers on U.S. 285 in the vicinity of the De Tilla Gulch SEZ would include residents, tourists, and other visitors to the SLV who would vary widely in their sensitivity to the visual contrast of solar facilities within the SEZ, with tourists and residents likely to be more sensitive than others. Because the vast majority of viewers would be in vehicles traveling by the relatively small SEZ at high speed, the duration of views would typically be five minutes or less. The highway passes within 0.4 mi of the SEZ and is slightly elevated with respect to the SEZ. As a result, solar facilities within the SEZ would appear very large with respect to other objects visible in the landscape, and would occupy a large part of the field of view. The details of the complex but highly regular geometry of the solar array would be apparent, and would contrast strongly with the "organic" appearance of the surrounding existing shrub vegetation. Even with good mitigation for color contrasts, the black PV panels or silver surfaces of parabolic trough mirrors would contrast strongly with the grays, greens, tans, and other hues of the existing vegetation. As travelers passed the SEZ, the angles of view and lighting on solar facilities would change, and dramatic changes in the appearance of the facilities could occur very rapidly, adding to the overall contrast created by the facilities.

Glare events could occur, especially from parabolic trough facilities, and because of the short distance between the highway and the SEZ, could cause annoyingly bright reflections, though of short duration. At night, lighting associated with solar facilities within the SEZ would be visible, and for parabolic trough facilities, could be prominent, even with good mitigation.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* The De Tilla North KOP does not have an unobstructed view of either the Antonito Southeast or Los Mogotes East SEZs, therefore no cumulative visual impacts from solar development within these SEZs is anticipated for the De Tilla North KOP. However, U.S. 285 passes immediately adjacent to the Antonito Southeast SEZ, and less than three miles from the Los Mogotes East SEZ, and thus travelers on U.S. 285 are subject to cumulative visual impacts from the sequential viewing of these SEZs; however, given the long distance from the De Tilla Gulch SEZ to the other two SEZs, many travelers would turn off U.S. 285 before reaching those SEZs. Impacts to U.S. 285 in the SLV as a whole, including cumulative impacts are discussed in Section 3.21.

### **3.2.6 Regional Compensatory Mitigation Recommendation**

Several representative KOPs were used to analyze impacts to U.S. 285. The basis for deciding if regional compensatory mitigation for visual impacts to U.S. 285 is warranted would consider impacts to all of the representative KOPs and other points on U.S. 285 from which solar facilities in the SEZ would be visible, and the cumulative impacts of sequential or simultaneous views of solar facilities in the SEZs. Impacts to U.S. 285 in the SLV as a whole and the potential warrant for regional compensatory mitigation are discussed in Section 3.21.

### 3.3 De Tilla South KOP (Representative KOP for Old Spanish Trail)

#### 3.3.1 VSA Description

*VSA Type:* Specially Designated Area

*Potentially Impacting SEZ:* De Tilla Gulch SEZ

*Distance from SEZ to Affected Area within VSA:* The De Tilla South KOP is located at the intersection of County Road AA (CR-AA) and County Rd. 54, approximately 0.4 miles from the southern boundary of the western portion of the SEZ. The distance from the KOP to the farthest point in the SEZ is approximately 2.3 mi. See Figure 3.3-1.

*Affected Area within the VSA:* The SEZ is located on a slight southeast-facing slope, north of the North Fork of the Old Spanish Trail (OST). Early trails were not single-track routes, but rather travel corridors in which the route of travel varied due to the type of pack animal or vehicle used as well as weather conditions, and it is possible that one or more variants of the OST may have crossed the SEZ. The original boundary of the proposed SEZ was adjusted to maintain a ¼-mile buffer from the trail. The SEZ is in full view when travelling in either direction the entire 13-mile length of CR-AA; a total of approximately 30 mi of the OST is located within the GIS calculated viewshed of the SEZ.

*Estimated Annual Visitation/Usage in VSA:* Most of the use of this road is by local ranchers, people travelling from Saguache to Moffat or Crestone, and traffic to the local landfill. Annual visitation information for those specifically exploring the OST is not available.

*Types of Activities within the Affected Area:* Driving, ranching, farming, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* Vehicular travel estimates for CR-AA are not available, but much of the traffic in this area is local. It is likely that more than 99% of viewers would be drivers or passengers in vehicles travelling through the area. The remaining 1% would be permanent residents or farm workers or those specifically exploring the OST.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* The OST is a congressionally designated historic trail and is promoted as a tourist attraction by state and local Chambers of Commerce, tourist boards and the Old Spanish Trail Association. CR-AA is designated as a portion of the North Fork of the OST and is promoted through OST maps and literature. Development of the *Comprehensive Management Plan and Environmental Impact Statement for the Old Spanish National Historic Trail* is currently under way.

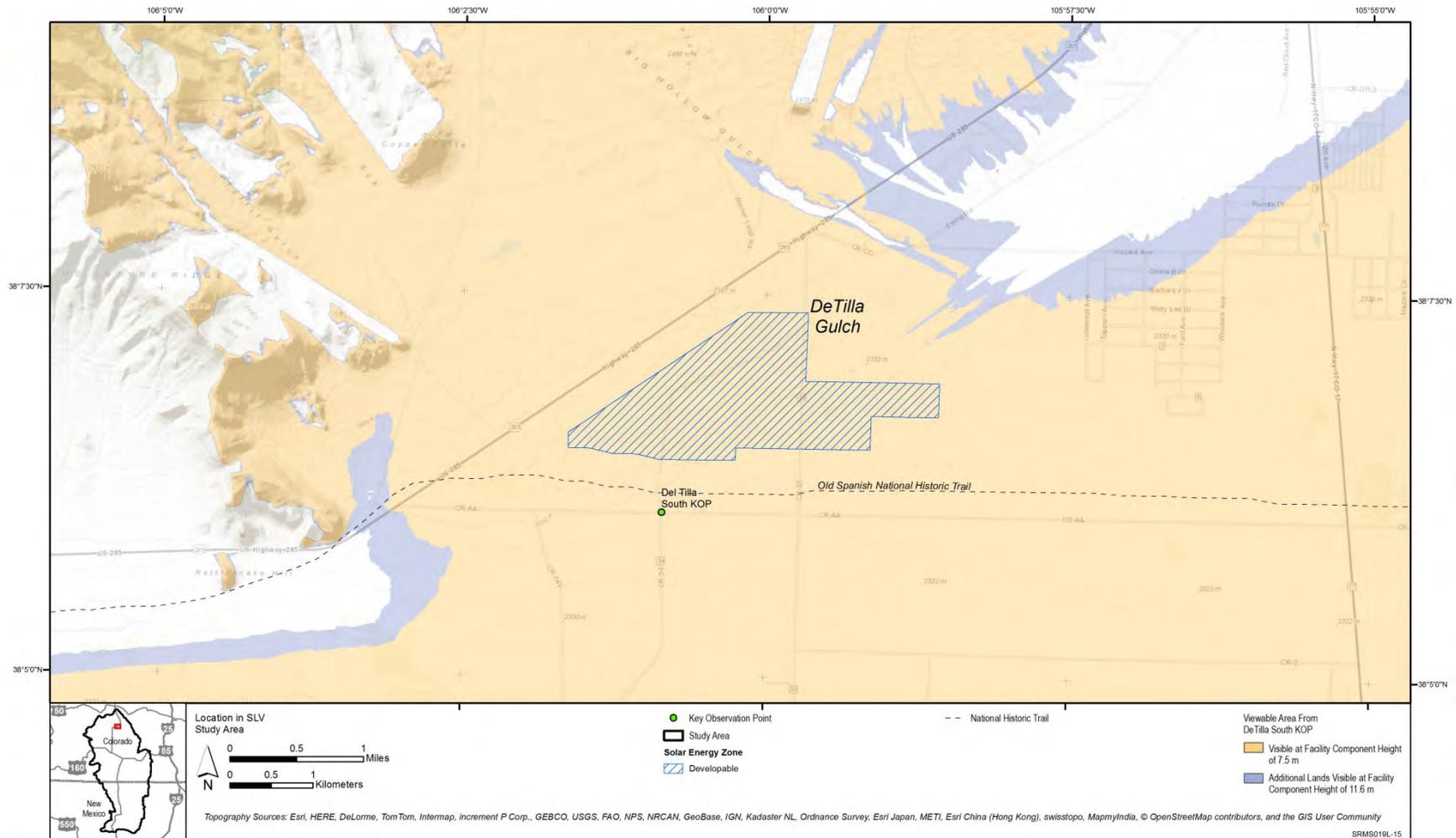


Figure 3.3-1 Viewshed from De Tilla Gulch South KOP, including Old Spanish Trail and De Tilla Gulch SEZ

### 3.3.2 KOP Description

*KOP Name:* De Tilla South

*KOP Location:* De Tilla South KOP is a point on or very near to the North Fork of the Congressionally Designated Old Spanish Trail. It is located south of the De Tilla Gulch SEZ at the intersection of County Road AA and County Road 54. See Figure 3.3-1.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The De Tilla South KOP is a representative viewpoint on or very near the congressionally designated route of the North Fork of the OST at the point of closest approach of the trail to the SEZ. The KOP offers an unobstructed panoramic view of the De Tilla Gulch SEZ.

*KOP Access Modes:* Automobile and truck.

### 3.3.3 Visual Context

*General Description:* Looking up a gentle slope from the southern side of the De Tilla Gulch SEZ onto an enclosed view of the northern portion of the valley floor which slopes slightly upwards towards the foothills of the San Juan Mountains. The Sangre de Cristo Mountains are located in the background to the east and the San Juan Mountains in the background to the west. Traffic on U.S. 285 approximately 1.1 mi northwest of the KOP crosses the view and is frequently visible. See Figure 3.3-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, fences, agricultural fields, grazing land, transmission lines, roads, and a landfill.

*Direction of View toward SEZ:* North

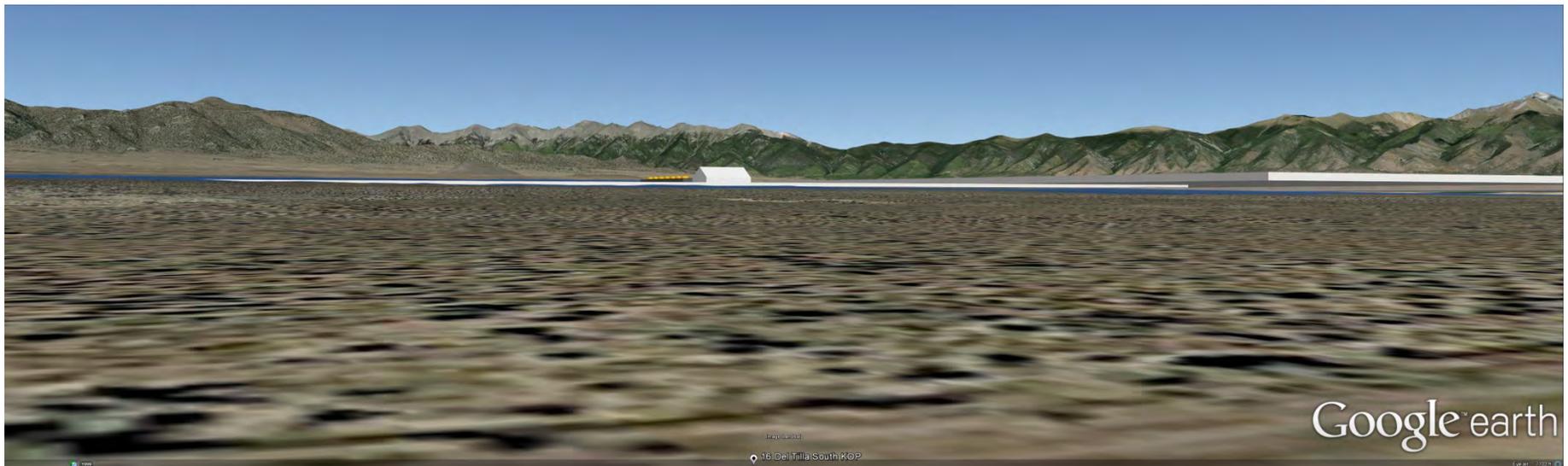
*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* 129° See Figure 3.3-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire De Tilla Gulch SEZ is within the GIS-calculated viewshed of the KOP.

*Orientation of the solar energy development within the field of view:* The De Tilla Gulch SEZ would be seen on the left side of the CR-AA for eastbound travelers and on the right side of the highway for westbound travelers. The De Tilla Gulch SEZ occupies the center of view looking north toward the foothills of the San Juan Mountains.



**Figure 3.3-2 Photograph of Existing Landscape from De Tilla South KOP Looking toward De Tilla Gulch SEZ. Note Distortion from Extremely Wide Angle of View.**



**Figure 3.3-3 Google Earth Schematic Visualization of De Tilla Gulch SEZ as Seen from De Tilla South KOP. Because of Relatively Short Distance to SEZ, Only a Portion of the SEZ Is Visible.**

### 3.3.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the De Tilla South KOP on August 14, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.3-1.

**Table 3.3-1 Visual Contrast Rating for De Tilla South KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√	√				√			
	Line				√	√				√			
	Color				√	√				√			
	Texture				√	√				√			

The overall contrast rating for the De Tilla South KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being *“The element contrast demands attention, will not be overlooked, and is dominant in the landscape.”* This corresponds most closely to the VRM Class IV objective, under normal lighting circumstances, regardless of solar technology type. The VRM Class IV objective from Manual 8431 is *“...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”*

The presence of parabolic trough facilities within the SEZ would result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources, as they would be relatively close to the viewer and visually prominent.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the De Tilla Gulch SEZ would be visible between 0.4 and 2.3 mi from the De Tilla South KOP. This distance is within the BLM foreground-middleground distance zone and is close enough that the surface details of structures within the SEZ would be visible. Solar collector/reflectors would be seen as individual elements in the immediate foreground and as a block of color nearing the middleground.
- **Angle of Observation.** The KOP (and the OST generally within the immediate vicinity of the KOP) is roughly equal to or slightly lower in elevation than the SEZ. The lower elevation of the viewpoint will cause the solar array to be seen more edge on, causing the solar array to appear as a horizontal band rather than a large area. Depending on their location within the SEZ, taller structures, such as cooling towers, steam turbine generators and other structure might be visible projecting above the solar collector/reflector arrays.
- **Length of Time the Project Is In View.** CR-AA is a designated segment of the Old Spanish Trail. For persons driving east on CR-AA, development within the SEZ will be visible for approximately 6 minutes until the SEZ was passed (assuming driving speed of 40 mph). For those driving west, solar development within the SEZ could be visible for about 17 minutes, depending on where the vehicle enters CR-AA. For those exploring the trail by other means (i.e. horseback, foot, bicycle) visibility will vary depending on mode of transportation and activities being conducted, but would be much longer, and could be an entire day for persons hiking the OST from the eastern edge of the SEZ viewshed. For persons travelling on other local roads, visibility would be brief, typically a few minutes depending on route and location. For residents/workers in the vicinity, solar development in the SEZ would be visible on a daily basis.
- **Relative Size or Scale.** Because of the relatively short distance between the KOP (and CR-AA and the OST generally in the immediate vicinity of the KOP), the solar array for either PV or parabolic trough facilities would be seen as a large, visually complex surface that would be out of scale with other objects in the view, and would extend across nearly the entire view looking north from the KOP. Cooling towers, steam turbine generators, and other structures associated with parabolic trough facilities could appear to be taller and larger than other structures in the area, which appear generally small in size.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless

of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Because of the open nature of the landscape between the KOP and the SEZ, defoliation of trees in the fall would have no effect on views of solar development in the SEZ. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Because of the close approach of CR-AA and the OST to the SEZ, the appearance of the facilities within the SEZ could change dramatically as travelers approached and then passed the SEZ, with the visual patterns, apparent colors, and reflectivity of facility surfaces subject to large changes in the space of a few seconds for those traveling by automobile, but more slowly for hikers, bikers, etc.

Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP, CR-AA, and the OST (in the immediate area) are south of the SEZ, incidence of glare from the solar reflector/collector array would likely occur at times. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. There are relatively few lights in the area, though there is light from moving vehicles on U.S. 285. Therefore, lighting from solar facilities would likely be prominent.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZ would be viewed at short distance from a position slightly lower in elevation. The lower elevation of the viewpoint would result in solar arrays being seen as a horizontal band across the view, but with structures potentially projecting above the arrays. Solar facilities in the SEZ would typically be viewed off to the side of the roadway from a vehicle, but more directly for hikers and

other travelers using slower modes of transportation. The viewing angle would change as travelers passed by the SEZ, causing noticeable changes in the appearance of facilities within the SEZ.

- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ. However, atmospheric conditions are not expected to greatly affect facility visibility on most days along the portion of CR-AA that runs parallel to the SEZ, or other local roads in the immediate vicinity because of the short distance to the SEZ. Haze, smoke, and dust could reduce contrast from solar facilities as seen from the more distant locations on CR-AA or the OST east of the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities could increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.3.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* CR-AA is the approximate location of the North Fork of the Old Spanish Trail (OST) in the vicinity of the KOP; although the majority of activity in the area consists of farming and ranching. Therefore, it is likely that most human use of the area will be from local residents tending their farms and ranches and travelling through the area by vehicle, foot, or potentially horseback. Industrial development is inconsistent with the rural visual character of the surrounding landscape, and with the historic character of the OST. Sensitive viewers might find the view of industrial-scale solar facilities unattractive or feel they are inconsistent with the expected character of this part of the SLV and/or the OST. Local residents would likely be relatively sensitive to solar facilities in SEZ; non-resident workers less so. Those exploring the trail are likely seeking recreational, educational, and relaxation opportunities, and would likely be sensitive to the presence of an industrial facility in plain view of the OST.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar facilities within the SEZ could not be missed by casual observers at the KOP or on the nearby stretch of CR-AA and the OST, regardless of the type of solar technology. Solar facilities in the SEZ would dominate the view, attracting and holding visual attention. If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents would likely make them contrast more strongly than if only PV facilities were located in the SEZ.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Travelers on CR-AA and the OST in the vicinity of the De Tilla Gulch

SEZ would include residents, tourists, and other visitors to the Valley who would vary widely in their sensitivity to the visual contrast of solar facilities within the SEZ, with tourists and residents likely to be more sensitive than others. While most viewers would be in vehicles traveling by the relatively small SEZ at high speed, and thus would have views of brief duration, a small percentage of viewers would be exploring the OST, or traveling through the area more slowly, and could have extended views. The OST passes within 0.4 mi of the SEZ and in this immediate area is slightly lower in elevation than most of the SEZ. Solar facilities within the SEZ would appear very large with respect to other objects visible in the landscape, and would occupy a large part of the field of view. The details of the complex but highly regular geometry of the solar array would be apparent, and would contrast strongly with the “organic” appearance of the surrounding existing shrub vegetation. Even with good mitigation for color contrasts, the black PV panels or silver surfaces of parabolic trough mirrors would contrast strongly with the grays, greens, tans, and other hues of the existing vegetation. As travelers passed the SEZ, the angles of view and lighting on solar facilities would change, and dramatic changes in the appearance of the facilities could occur, adding to the overall contrast created by the facilities.

Glare events could occur, especially from parabolic trough facilities, and because of the short distance between the KOP and the SEZ, could cause annoyingly bright reflections, though generally of short duration. At night, lighting associated with solar facilities within the SEZ would be visible, and for parabolic trough facilities, could be prominent, even with good mitigation.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* The De Tilla South KOP does not have an unobstructed view of either the Antonito Southeast or Los Mogotes East SEZs, therefore no cumulative visual impacts from solar development within these SEZs is anticipated for the KOP. Farther south in the San Luis Valley, the OST may have direct views of portions of the Antonito Southeast SEZ and the Los Mogotes East SEZ; however, if these views exist, given the long distance from the OST to the other two SEZs, no non-negligible cumulative visual impacts from solar facilities within the SEZs would be expected. Impacts to the OST in the San Luis Valley as a whole, including cumulative impacts, are discussed in Section 3.7.3.

### **3.3.6 Regional Compensatory Mitigation Recommendation**

Several representative KOPs were used to analyze impacts to the OST. The basis for deciding if regional compensatory mitigation for visual impacts to the OST is warranted would consider impacts to all of the representative KOPs and other points on the OST from which solar facilities in the SEZ would be visible, and the cumulative impacts of sequential or simultaneous views of solar facilities in the SEZs. Impacts to the OST in the San Luis Valley as a whole and the potential warrant for regional compensatory mitigation are discussed in Section 3.7.



### **3.4 Liberty Trail (Representative KOP: Liberty Trailhead; Also Representative KOP for Old Spanish Trail)**

#### **3.4.1 VSA Description**

*VSA Type:* Specially Designated Area

*Potentially Impacting SEZ:* De Tilla Gulch SEZ

*Distance from SEZ to Affected Area within VSA:* Approximately 22.8 miles from the closest point in the VSA to the closest point in the SEZ. Approximately 25.3 mi from the closest point in the VSA to the farthest point in the SEZ. See Figure 3.4-1.

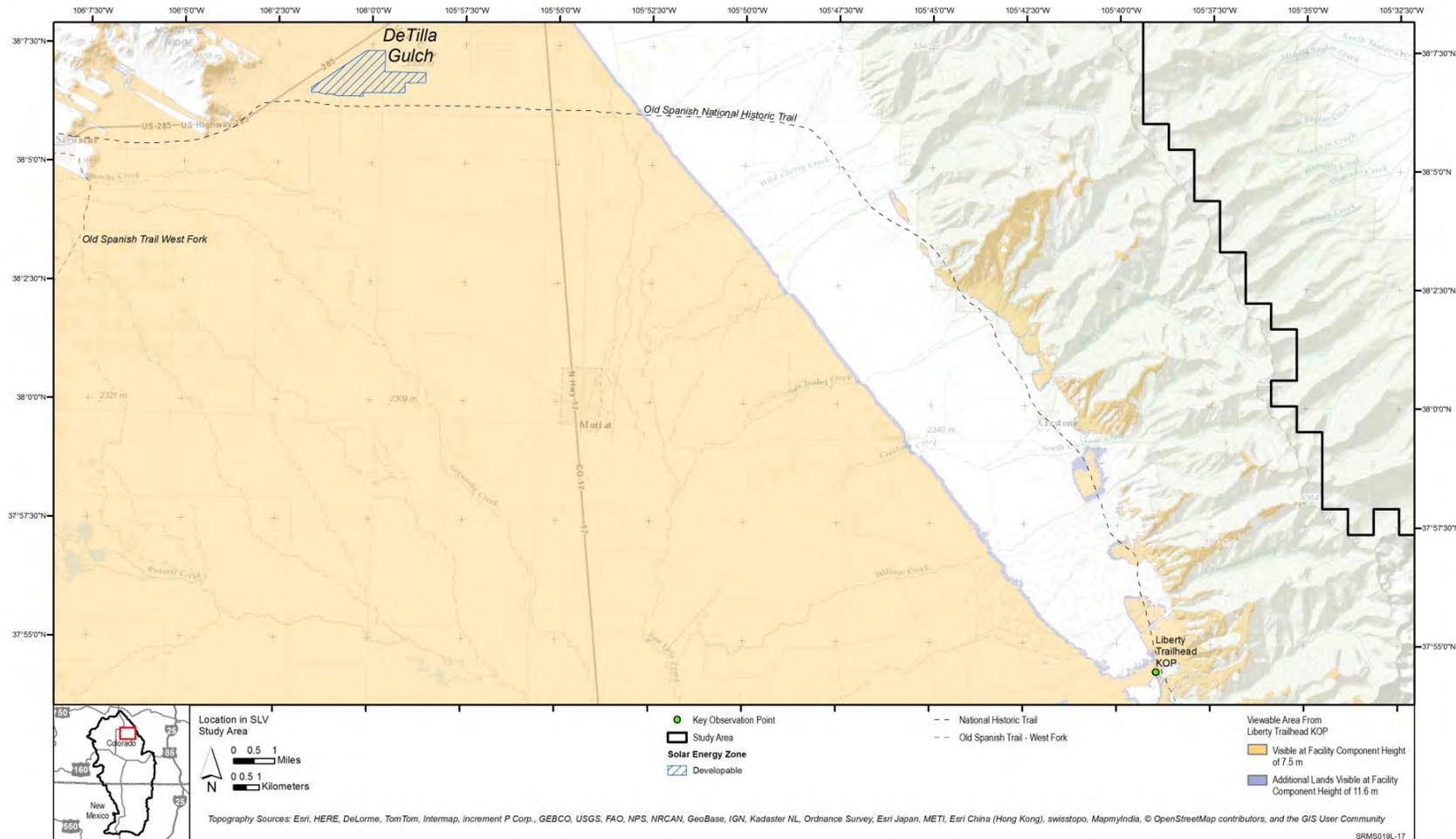
*Affected Area within the VSA:* The Liberty Trail follows the base of the Sangre de Cristo mountain range for roughly ten miles from Crestone to the northern border of Great Sand Dunes National Park (GSDNP), passing the ghost towns of Duncan and Liberty (Michalak 2012). The Liberty Trail also allows access to the GSDNP back country and is used by big game hunters. This is also the approximate location of the East Fork of the North Branch of the Old Spanish Trail (OST). Early trails were not single-track routes, but rather travel corridors in which the route of travel varied due to the type of pack animal or vehicle used as well as weather conditions. The SEZ is potentially in view when travelling north, returning from the Great Sand Dunes.

*Estimated Annual Visitation/Usage in VSA:* Visitor estimates are not available; however, BLM describes the trailhead as receiving “heavy recreational use” (Brown 2015a).

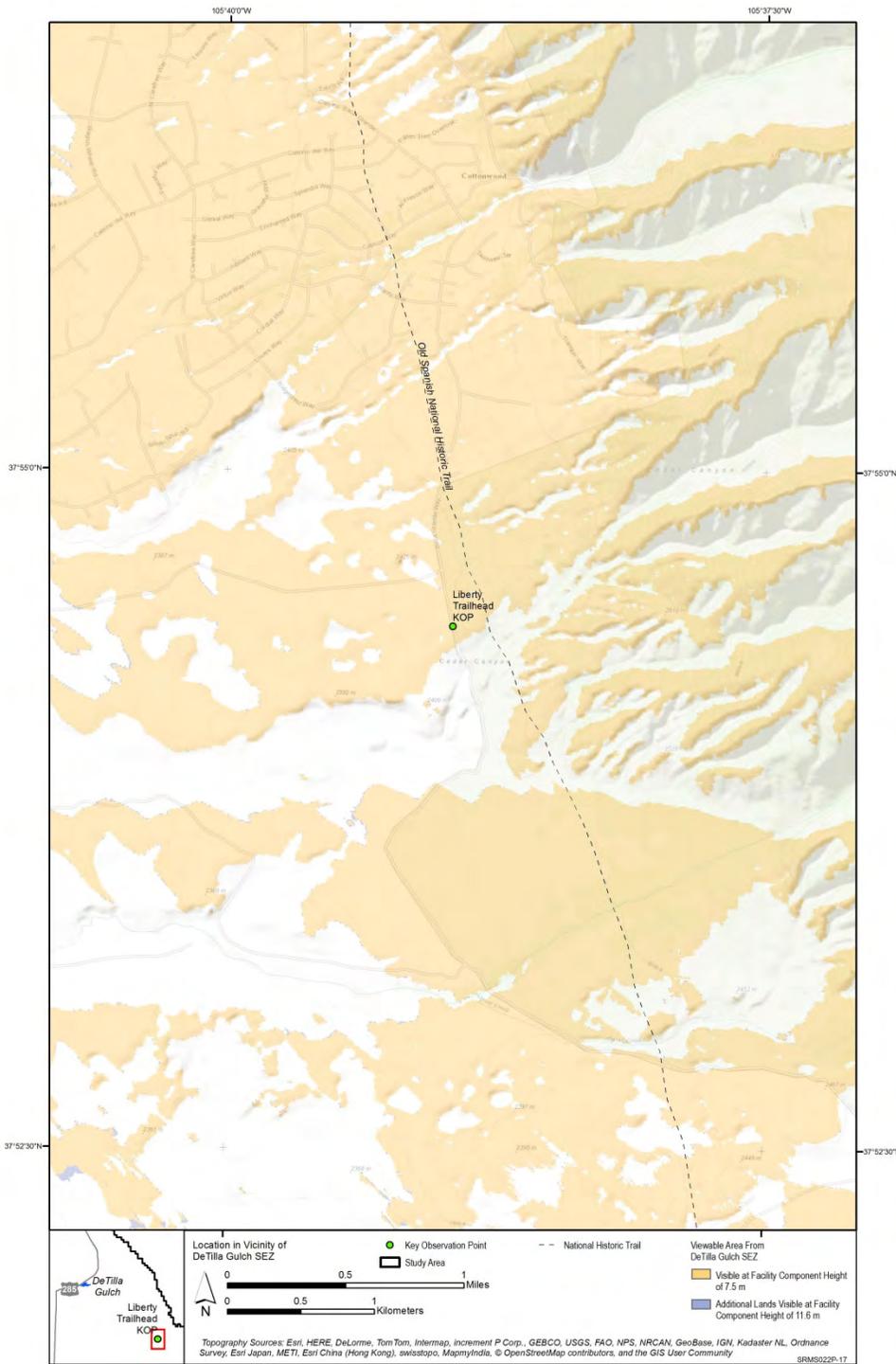
*Types of Activities within the Affected Area:* Horseback riding, photography, wildlife viewing, birding, big game hunting, hiking, exploring the OST.

*Estimated proportion of visitors conducting each major activity type:* The majority of the activity in this area is from local residents and tourists who are conducting one of the activities listed above.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* The OST is a congressionally designated historic trail and is promoted as a tourist attraction by state and local Chambers of Commerce, tourist boards and the Old Spanish Trail Association. The *Comprehensive Management Plan and Environmental Impact Statement for the Old Spanish National Historic Trail* is currently under development.



**Figure 3.4-1 Viewshed from Liberty Trailhead KOP, including East Fork of the North Branch of the Old Spanish Trail and De Tilla Gulch SEZ**



**Figure 3.4-2 Viewshed of the De Tilla Gulch SEZ, including East Fork of the Old Spanish Trail and the Liberty Trailhead/OST KOP**

### 3.4.2 KOP Description

*KOP Name:* Liberty Trailhead/OST

*KOP Location:* The Liberty Trailhead/OST KOP is located in the Liberty Trailhead parking lot, at a point on or very near to the East Fork of the North Branch of the Congressionally Designated Old Spanish Trail (OST). See Figure 3.4-2.

*Critical or Representative KOP:* Critical, also representative KOP for OST

*Critical Nature of Affected View (if applicable):* The trailhead and Liberty Trail is heavily used for recreational purposes, and is also located on or near the East Fork of the North Branch of the OST.

*Rationale for Selecting KOP:* The Liberty Trailhead is a critical viewpoint, and is also on or very near the Congressionally Designated route of the East Fork of the OST. This KOP offers an unobstructed view of the De Tilla Gulch SEZ .

*KOP Access Modes:* Automobile and foot.

### 3.4.3 Visual Context

*General Description:* Looking northwest onto a panoramic view of the northern San Luis Valley floor, with the San Juan Mountains in the distant background to the west and the foothills of the San Juan Mountains to the northwest . The Sangre de Cristo Mountains are visible to the north and northeast. See Figure 3.4-3.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, fences, agricultural fields, grazing land, and roads.

*Direction of View toward SEZ:* Northwest

*Horizontal Field of View (in degrees) Potentially Occupied by Solar Energy Development within the SEZ:* 5°. See Figure 3.4-4.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire De Tilla Gulch SEZ is within the GIS-calculated viewshed of the KOP.

*Orientation of the Solar Energy Development within the Field of View:* The De Tilla Gulch SEZ is to the far right of the center of view.



**Figure 3.4-3 Photograph of Existing Landscape from Liberty Trailhead/OST KOP Looking toward De Tilla Gulch SEZ**



**Figure 3.4-4 Google Earth Schematic Visualization of De Tilla Gulch SEZ as Seen from Liberty Trailhead/OST KOP**

### 3.4.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Liberty Trailhead/OST KOP on August 14, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned contrast rating form is available in Appendix A. The contrast rating is presented in Table 3.4-1.

**Table 3.4-1 Visual Contrast Rating for Liberty Trailhead/OST KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√				√				√
	Line				√				√			√	
	Color				√				√			√	
	Texture				√				√				√

The overall contrast rating for the Liberty Trailhead KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

The presence of parabolic trough facilities within the SEZ would be likely to result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources.

During glare incidents the degree of contrast could increase substantially; however, given the relatively long distance between the KOP and the SEZ (22.8-25.3 mi), and the very small apparent size of the SEZ as seen from the KOP, while the contrast might begin to attract attention, it would be too small in apparent size and likely too faint to begin to dominate the view. Thus even with glare, solar development within the SEZ would not likely cause *Moderate* contrast (as defined in the BLM Visual Contrast Rating Manual 8431) for viewers at the KOP and nearby locations.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the De Tilla Gulch SEZ would be visible between 22.8 miles and 25.3 mi from the Liberty Trailhead/OST KOP. This distance is within the BLM Seldom Seen distance zone. Solar collector/reflector arrays in the SEZ could potentially be seen as blocks of color but because of the distance would appear very small in size, would lack surface details, and might be difficult to distinguish from the background.
- **Angle of Observation.** The SEZ is on a slight slope that rises toward the northwest, such that the northwestern edge of the SEZ is tilted slightly upward toward the viewer, as seen from the Liberty Trailhead/OST KOP. This would slightly increase visibility of solar facilities within the SEZ. However, the KOP is approximately 200-300 ft higher in elevation than the SEZ, and because of the long distance between the KOP and the SEZ, the vertical angle of view is still very low. Solar facilities within the SEZ would be visible as a short thin line at the base of distant mountains. Because of the distance and low angle of view, solar facilities in the SEZ would be difficult to discern under normal lighting conditions, and it is very unlikely that persons not familiar with the nature of the SEZ and its location would recognize it as consisting of solar facilities.
- **Length of Time the Project Is In View.** The length of visibility would depend on the activity of the user. Solar facilities within the SEZ might be visible for several minutes when taking in the panoramic view of the San Luis Valley from the Liberty Trailhead parking lot. For persons hiking south on the Liberty Trail, the SEZ would be behind them and generally not in view. Solar facilities within the SEZ could be visible for extended periods for persons traveling northward on the Liberty Trail, but screening from foreground vegetation and the small apparent size of the SEZ would make it unlikely that people would notice the solar facilities within the SEZ.
- **Relative Size or Scale.** Because of the very low viewing angle, the apparent size of the SEZ would be greatly reduced, and it would spread across a very small portion of the horizontal field of view (approximately 5°). The SEZ is far enough away from the

Liberty Trailhead/OST KOP that solar facility structures would blend very well with existing structures in the view. They could not be distinguished as separate structures.

- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, the color of solar facilities within the SEZ would contrast strongly with existing vegetation (generally tan or green depending on season) regardless of season of use; however, at a distance of 23-25 mi, the color contrast would not likely be visible. Contrast might be stronger when snow is on the ground, particularly for PV facilities, which have black panels, but again, the perceived contrast would be minimal at 23-25 mi. Because of the open nature of the landscape between the KOP and the SEZ, and because some foreground vegetation is evergreen, defoliation of trees in the fall is not likely to change the views of solar facilities within the SEZ significantly. In certain conditions when air temperatures are low, the visibility of water vapor plumes from cooling towers and/or gas boilers at parabolic trough facilities could increase substantially, but at the very long distance between the KOP and the SEZ, if plumes were visible, they would be very small in apparent size, and might be difficult to see.
- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because Liberty Trailhead/OST KOP is south of the SEZ, there might sometimes be reflected light visible from solar facilities within the SEZ, but at a distance of 23-25 mi, it would not likely be perceived as annoyingly bright.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. At a distance of 23-25 mi, facility lighting would be faint, and would likely blend in very well with existing lights visible in areas near the SEZ.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZ would be observed from a very low vertical angle of view across the base of a distant mountain ridge. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape.

- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ. Because of the long distance between the Liberty Trailhead/OST KOP and the SEZ, atmospheric haze could sometimes be a significant factor in obscuring visibility of facilities within the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.4.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The Liberty Trail follows the base of the Sangre de Cristo mountain range for roughly ten miles from Crestone to the northern border of Great Sand Dunes National Park (GSDNP), passing the ghost towns of Duncan and Liberty (Michalak 2012). This is also the approximate location of the East Fork of the North Branch of the Old Spanish Trail (OST). Those using the trail are likely seeking recreational, educational, and relaxation opportunities such as horseback riding, photography, wildlife viewing, birding, big game hunting, hiking, exploring the Old Spanish Trail. Visitors could potentially see solar development within the SEZ while looking out onto the SLV from the Liberty Trailhead parking lot before they head out onto the trail, or while heading north, returning from the Great Sand Dunes.

The Liberty Trail also allows access to the GSDNP back country and is used by big game hunters. At higher elevations when looking to the north or west, individuals in the backcountry could potentially have a view of the SEZ.

Industrial development is inconsistent with the natural and rural visual character of the surrounding landscape. Some visitors might find the view of industrial-scale solar facilities unattractive.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be visible to persons at the Liberty Trailhead/OST KOP and on the Liberty Trail, but because of the distance to the SEZ, the very small apparent width of the SEZ, the low height of the facilities, and the very low angle of view, the facilities would be missed by most casual observers. This would particularly be true if development was limited to PV facilities, but still likely if parabolic trough facilities were located within the SEZ.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Users of the Liberty Trail would be considered to be sensitive viewers;

however, because of the distance to the SEZ, the very small apparent size of the SEZ, and the very low viewing angle, expected visual contrast would be weak, and impacts minor.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them unlikely to be noticed by casual observers. An exception would be when glare events occurred and caused bright reflections which might be noticed by casual observers; however, these events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, and cause very little light pollution.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night makes them substantially more visible than PV facilities. However, given the viewing angle, distance, and screening, having parabolic trough facilities in the SEZ would not likely cause moderate levels of visual contrast under normal viewing circumstances for viewers at the Liberty Trailhead/OST KOP and on the Liberty Trail.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* The Los Mogotes East and Antonito Southeast SEZs are located 51 and 62 mi from the Liberty Trailhead/OST KOP, respectively. The GIS viewshed analyses conducted for this visual impact analysis did not extend to these distances; however, map inspection shows that the Antonito Southeast SEZ would be mostly or completely screened from view from the KOP vicinity by hills south of Manassa, while the Los Mogotes SEZ is likely visible. However, even if clear lines of sight existed between the Liberty Trailhead/OST KOP vicinity and the Los Mogotes and Antonito Southeast SEZs, the SEZs are only a few hundred feet lower in elevation than the KOP, and because of the very low angle of view at the very long distances involved, it is extremely unlikely that solar development within the SEZs could be seen from the KOP vicinity. Therefore, no cumulative visual impacts from solar energy development within the Los Mogotes and Antonito Southeast SEZs are expected.

### **3.4.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the De Tilla Gulch SEZ would not likely be noticeable to casual observers at the Liberty Trailhead/OST KOP and on the Liberty Trail, except possibly for very small plumes faintly visible at certain times, and possibly minor glare incidents. Solar development in the De Tilla Gulch SEZ would be expected to create weak visual contrasts overall. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the Liberty Trailhead/OST KOP and the Liberty Trail as a result of solar development in the De Tilla Gulch SEZ.

### 3.5 Community of Moffat

#### 3.5.1 VSA Description

*VSA Type:* Community

*Potentially Impacting SEZ:* De Tilla Gulch SEZ

*Distance from SEZ to Affected Area within VSA:* Approx. 7.7 mi from closest point in VSA to closest point in the SEZ. Approx. 9.5 mi from closest point in VSA to farthest point in the SEZ. See Figure 3.5-1.

*Affected Area within the VSA:* The SEZ is located on a slight southeast-facing slope, northwest of Moffat. Visibility from “downtown” Moffat is intermittent due to screening by vegetation and structures. As a result, visibility from Moffat is better at the northern side of the community, though there could be intermittent views throughout Moffat. Local residents in these areas are most likely to be impacted by development in the De Tilla Gulch SEZ. The SEZ is visible when traveling north on CO-17 from Moffat or when travelling west on County Road T (CR-T) and other local roads from the Crestone area almost to Saguache, but may be intermittently screened by vegetation or structures.

*Estimated Annual Visitation/Usage in VSA:* The population of Moffat is 116 people (US Census 2010). In addition, large numbers of persons passing through Moffat would see the SEZ while driving. CDOT (2013) estimates that 1,300 vehicles per day travel on US-17 through Moffat. Estimated vehicle usage for CR-T is not available. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 735,000, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

*Types of Activities within the Affected Area:* Driving, walking, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that 1,300 vehicles per day travel on CO 17 through Moffat, some of which may be travelling to tourist destinations such as the Great Sand Dunes National Park or the Crestone area. The population of Moffat is 116 people (US Census 2010). Thus, more than 99% of viewers would be drivers or passengers in vehicles passing through the area. Less than 1% would be permanent residents of Moffat. A very small but unknown percentage of travelers through Moffat would likely stop in Moffat, and potentially be exposed to views of the SEZ during their visit.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* No master plan was found for Moffat. Currently, the affected area of Moffat is in residential use.

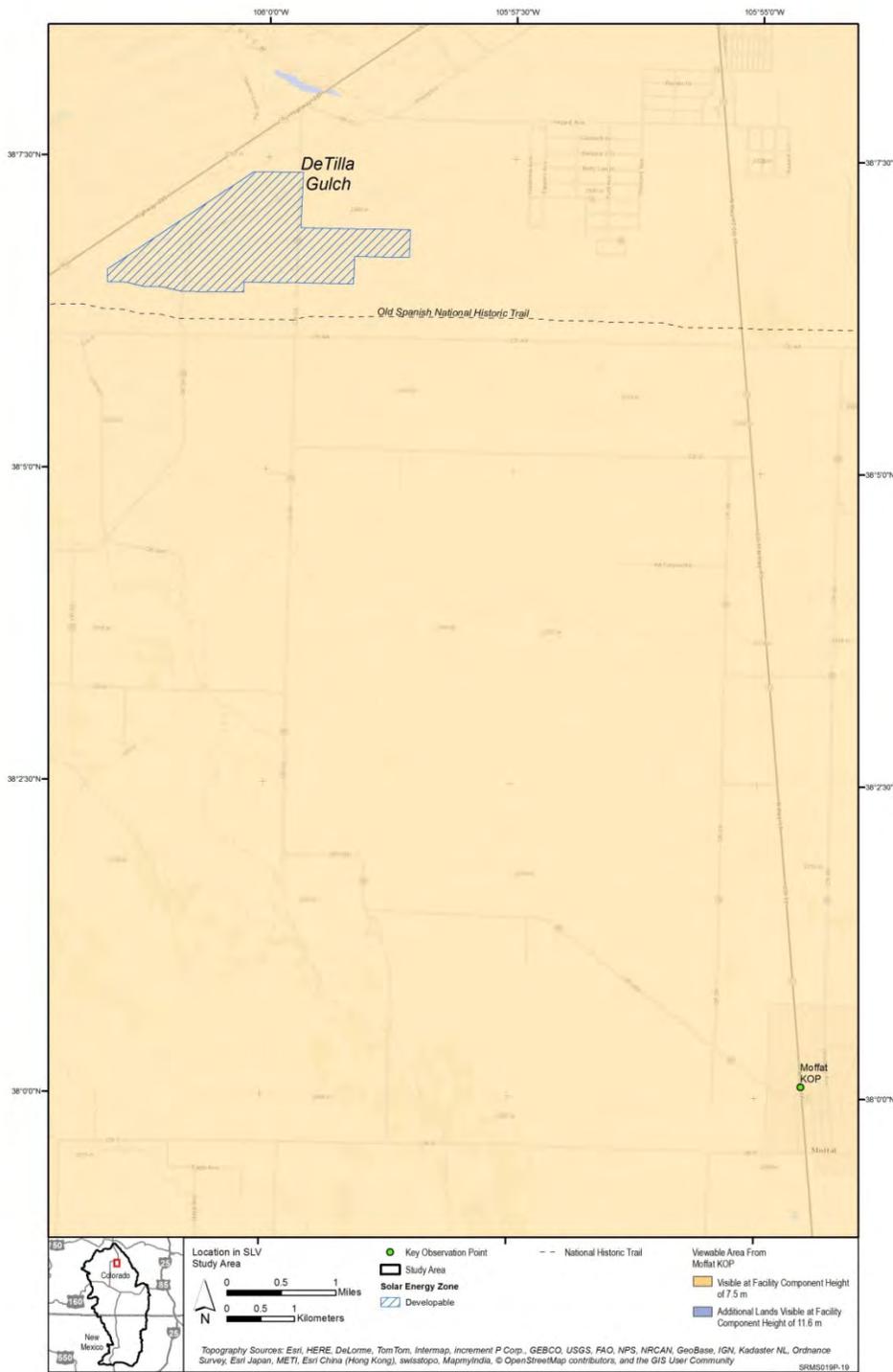


Figure 3.5-1: Viewshed from Moffat KOP, including De Tilla Gulch SEZ

### 3.5.2 KOP Description

*KOP Name:* Moffat

*KOP Location:* Representative KOP is located on CO-17, approximately 0.6 mi north of its intersection with County Road T, near the 38<sup>th</sup> parallel sign.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* Representative view towards De Tilla Gulch SEZ from Moffat and nearby areas.

*KOP Access Modes:* Automobile, truck, and foot.

### 7.1.3 Visual Context

*General Description:* Looking northwest towards De Tilla Gulch SEZ from the northern edge of Moffat. View of an agricultural/pastoral landscape with scattered ranches leading to a forested mountain ridge backdrop. See Figure 3.5-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes and other community buildings, farm structures, fences, agricultural fields, roads, utility lines, road signage.

*Direction of View toward SEZ:* NW

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approx. 18°. A few scattered trees and shrubs provide minor screening elements between Moffat and SEZ. See Figure 3.5-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire SEZ is within the GIS-calculated viewshed of the KOP; however, widely scattered trees and shrubs provide minor screening elements between Moffat and the SEZ.

*Orientation of the solar energy development within the field of view:* SEZ is to the left of approximate center of view.



**Figure 3.5-2 Photograph of Existing Landscape from Moffat KOP Looking toward De Tilla Gulch SEZ**



**Figure 3.5-3 Google Earth Schematic Visualization of De Tilla Gulch SEZ as Seen from Moffat KOP**

### 3.5.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Moffat KOP on October 6, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.5-1.

**Table 3.5-1 Visual Contrast Rating for Moffat KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√			√				√	
	Line				√			√				√	
	Color				√		√					√	
	Texture				√			√				√	

The overall contrast rating for the Moffat KOP is *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

During glare incidents, while contrasts would increase, potentially substantially, because of the distance to the facility the glare contrast would attract attention but would not be expected to dominate the view, and would be relatively brief in duration. Contrast would not be expected to rise above *Moderate*.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental

factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the De Tilla Gulch SEZ would be visible between 7.7 and 9.5 mi from the closest point in Moffat. This distance is in the BLM background distance zone; however, it is close enough that the shapes and colors of structures within the SEZ would be visible. Surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements.
- **Angle of Observation.** The SEZ is on a slight slope that rises toward the northwest, such that the northwestern edge of the SEZ is tilted slightly upward toward the viewer, as seen from Moffat. This would slightly increase visibility of solar facilities within the SEZ; however, the angle of view is still very low, and solar facilities would be visible as a very narrow band at the foot of a distant, low mountain ridge, with some slight screening by foreground vegetation. Because of the distance and low angle of view, though facilities within the SEZ would often be plainly visible, it is unlikely that persons not familiar with the nature of the SEZ would recognize it as consisting of solar facilities.
- **Length of Time the Project Is In View.** For residents and visitors to Moffat, views could be extended; for residents, solar developments in the SEZ would be visible on a daily basis, in some cases from resident's yards, and from some streets in town. For persons travelling north on CO-17 from Moffat, facilities within the SEZ would be in view for approximately 20 minutes. For person driving west on County Road T from Crestone to Moffat, facilities within the SEZ would be visible for up to 15 minutes. For those continuing to Saguache, facilities within the SEZ would likely be visible out the passenger window for another 10 minutes. For persons driving other local roads, visibility would be brief, typically a few minutes, depending on route and location.
- **Relative Size or Scale.** Solar facilities within the SEZ would be larger in horizontal extent than most other visible objects in the view. Because of the low viewing angle, the apparent size of the SEZ would be reduced, but would still spread across a substantial portion (18°) of the horizontal field of view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Because of the very open nature of the landscape between Moffat and the SEZ, defoliation of trees in the fall is not likely to change views of solar development in the SEZ substantially, but might slightly reduce screening of the SEZ by foreground vegetation. In certain conditions when air

temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because Moffat is southeast of the SEZ, glare might be observed from solar facilities in the SEZ. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view at the foot of a nearby mountain ridge that is a moderate focus of views in the general direction of the SEZ as seen from Moffat. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could sometimes reduce visibility of solar facilities within the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.5.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Moffat is a small community in a rural area with substantial views of largely natural-appearing landscapes. Residents of Moffat would be able to see industrial development

in the SEZ anytime they look to the northwest from the northern and western, and potentially northeastern portions of their community, and when driving through the local area. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Some residents might find the view of industrial-scale solar facilities unattractive and inappropriate.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be plainly visible to persons in Moffat with unobstructed views looking directly at the SEZ. The community of Moffat consists of relatively widely scattered buildings without dense vegetation, so views of solar facilities within the SEZ could exist throughout the community. There is relatively little screening vegetation between Moffat and the SEZ. If parabolic trough facilities were located in the SEZ, the height of the reflector array, various buildings and other structures, presence of plumes under some conditions, and likelihood of glare incidents would attract visual attention, and make them unlikely to be missed by a casual observer. PV facilities would be harder to see, and might be missed by some casual observers. Regardless of solar technology, during glare incidents, the bright reflected light would likely attract the attention of casual observers.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* The residents of Moffat would be considered to be sensitive viewers; persons driving through Moffat on average would be less sensitive, but would vary from low to high sensitivity. Solar development within the SEZ would be plainly visible to some residents on a daily basis and potentially for extended viewing periods. The other residents would likely view solar development in the SEZs briefly while driving to and from their homes. A very large number of persons would also see solar development in the SEZ very briefly while driving through Moffat.

As seen from Moffat, solar development in the De Tilla Gulch SEZ would appear as a horizontal band of dark or light color (depending on technology type and lighting) with the angular forms of buildings visible projecting above it at the base of the foothills of the San Juan Mountains. The thin band of the solar arrays would be minimally obscured by shrubs, small trees, and structures in the foreground of views from Moffat.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color (especially as seen from the north, where views would generally be looking at the shadowed backs of the solar arrays), and lack of visible water vapor plumes would make them less likely to be noticed by casual observers than the taller, more complex, and more reflective components of parabolic trough facilities. Glare events would likely be observed sometimes because Moffat is southeast of the SEZ and the PV panels in tracking systems would face southeast at some points in the day in some seasons of the year. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, causing very little light pollution, and thus causing minimal night sky impacts.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities, and they likely would be noticeable to casual observers. Considering the viewing angle, distance, and screening, parabolic trough facilities in the SEZ would likely cause moderate levels of visual contrast under normal viewing circumstances for viewers in Moffat.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Because Moffat does not have an unobstructed view of either the Antonito Southeast or Los Mogotes East SEZs, no cumulative visual impacts from solar development within these SEZs is anticipated for viewpoints in or near Moffat.

### **3.5.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the De Tilla Gulch SEZ would be visible from many locations in Moffat. Furthermore, the visual contrast rating for the Moffat KOP indicated that solar development in the De Tilla Gulch SEZ would create moderate visual contrasts overall, under normal viewing conditions. Higher levels of visual contrast could occur during glare incidents, and because Moffat is southeast of the SEZ, glare incidents would be expected to occur at certain times of the day/year, especially for persons driving local roads in the vicinity of Moffat. As a result, regional compensatory mitigation is recommended as compensation for potential visual impacts that might occur in the community of Moffat as a result of solar development in the De Tilla Gulch SEZ.

### 3.6 Valley View Hot Springs/Black Canyon WSA

#### 3.6.1 VSA Description

*VSA Type:* Community (Valley View Hot Springs) and Specially Designated Area (Black Canyon WSA)

*Potentially Impacting SEZ:* De Tilla Gulch SEZ

*Distance from SEZ to Affected Area within VSA:* Approximately 9.7 mi from closest point of the Valley View Hot Springs to the closest visible point in the De Tilla Gulch SEZ. Approximately 13 mi from the closest point in the Valley View Hot Springs to farthest visible point in the De Tilla Gulch SEZ.

Approximately 9.7 mi from closest point in the Black Canyon WSA to the closest point in the De Tilla Gulch SEZ. Approximately 12.2 mi from the closest point in the Black Canyon WSA to the farthest point in the De Tilla Gulch SEZ. See Figure 3.6-1.

*Affected Area within the VSA:* The SEZ is located on a slight southeast-facing slope, southwest of Valley View Hot Springs, which is part of the larger Oriental Land Trust (OLT). The OLT operates the Valley View Hot Springs Resort on its property as well as the Bat Cave at the Orient Iron Mine and Everson Ranch. These locations, as well as the two trail heads on either side of the OLT are popular recreation spots. Visibility of the De Tilla Gulch SEZ from the property is intermittent, due to screening by vegetation and structures, but the SEZ is in full view from locations along the western edge of the property. Partial views of the SEZ are available from hiking trails and soaking pools on the property. The SEZ is also visible when driving away from the property on County Road GG (CR-GG).

The total area within the Black Canyon WSA is 1,189 acres. The SEZ is potentially visible from 1,019 acres in the Black Canyon WSA, or approximately 86% of the WSA. Actual visibility of the SEZ is lower because of screening by vegetation within the WSA, which is dense in some parts of the WSA; however, some ridges are not forested (particularly on the south-facing slopes), and visitors in these areas would have elevated open views of the SEZ.

*Estimated Annual Visitation/Usage in VSA:* The OLT property is a popular recreation spot and the resort area is promoted as a tourist destination. Annual visitation numbers for the Oriental Land Trust are not readily available. However, the Valley View Hot Springs reservation calendar (available on their website at [www.olt.org](http://www.olt.org)) indicates limited vacancies and recommends reservations, suggesting the hot springs are a popular destination.

The Black Canyon WSA is adjacent to the Black Canyon WSA. It is likely that visitors to the WSA are participating in recreation activities such as hiking. Estimated annual visitation for the WSA is not available, but is assumed to be low because of the lack of roads with the WSA.

*Types of Activities within the Affected Area:* Valley View Hot Springs: Walking, hiking, camping, relaxation, seeking solitude, soaking in hot springs. Black Canyon WSA: Hiking, backpacking, camping, photography (BLM 2015).

*Estimated proportion of visitors conducting each major activity type:* It can be assumed that nearly 100% of the people visiting the Valley View Hot Springs and the rest of the OLT are participating in relaxation or recreation activities such as walking, hiking, camping, seeking solitude, and soaking in the hot springs.

Most visitors to the WSA would be participating in the recreation activities listed above; however percentages of people conducting each type of activity are not known.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* The OLT was created for the “protection of a vast, uninterrupted landscape against ever-increasing usage and development pressure, while preserving the natural, agricultural, and historic values of the land.” The OLT’s objectives, goals, and strategies for its entire property, (including the Valley View Hot Springs) include protecting the view, wildlife corridors, dark skies, and open space within the OLT’s area of geographic concern by utilizing appropriate conservation tools and promoting land stewardship among other visitor space protection, land conservation and preservation, research and education, and community relations goals (OLT 2015).

The Black Canyon WSA is managed to protect its wilderness characteristics.

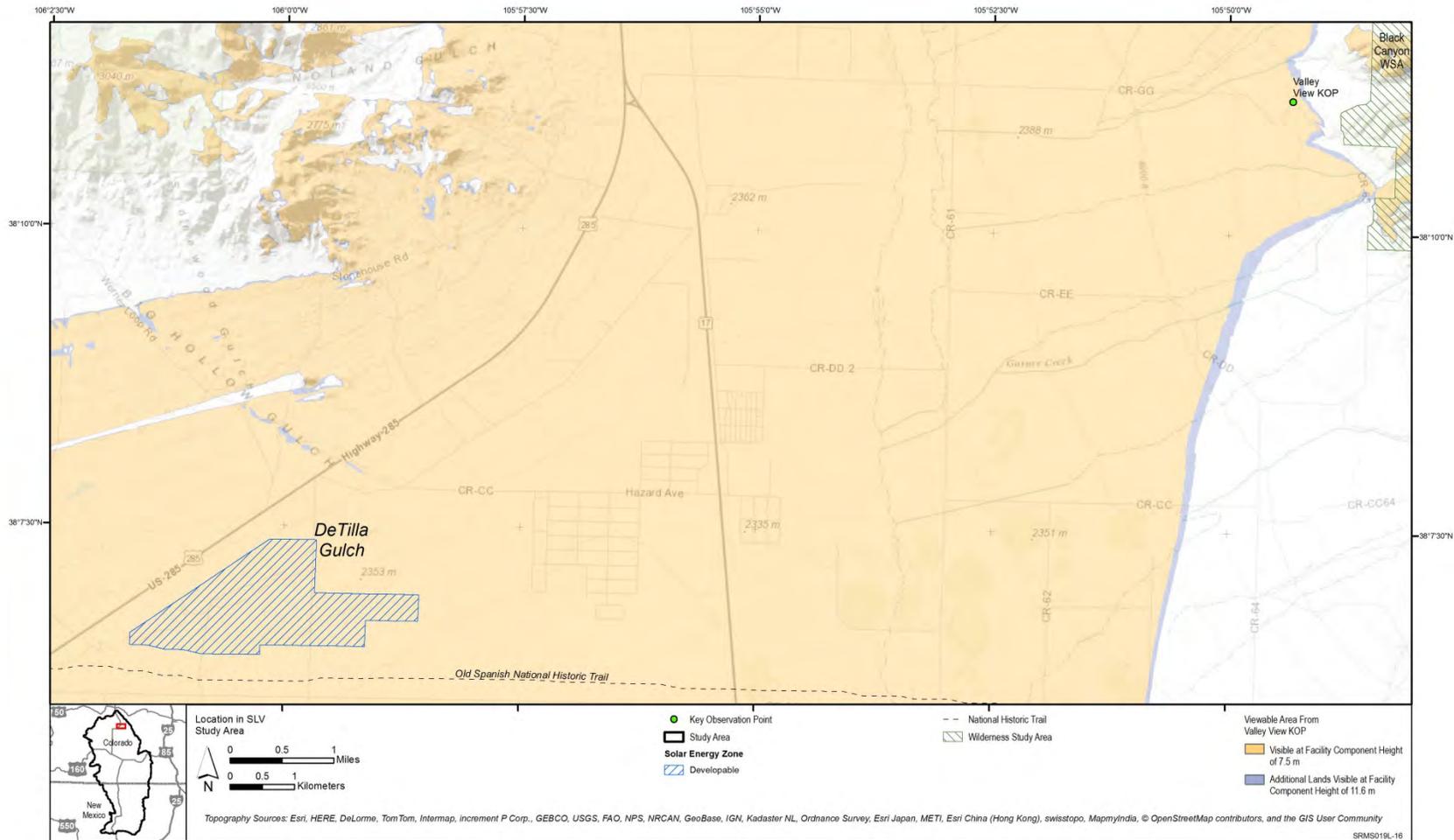


Figure 3.6-1: Viewshed from Valley View Hot Springs/Orient Land Trust, Black Canyon WSA KOP, Including De Tilla Gulch SEZ

### 3.6.2 KOP Description

*KOP Name:* Valley View

*KOP Location:* Representative KOP is located at the corner of CR-GG and CR-65, approximately 0.5 mi southwest of the OLT visitor office. See Figure 3.6-2.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* This KOP was selected as a representative view from the Black Canyon WSA and the OLT. Both VSAs are located on higher ground east of the De Tilla Gulch SEZ and have panoramic views to the west across the upper SLV, including the SEZ. The VSAs are in close proximity and have similar views.

*KOP Access Modes:* Primarily automobile and foot.

### 3.6.3 Visual Context

*General Description:* Looking west-southwest towards De Tilla Gulch SEZ from a high point on the eastern side of the valley. The Valley View KOP offers a panoramic view west across the SLV. Land uses on the valley floor include agricultural and pastoral uses, with scattered rural development and the small town of Moffat visible. The San Juan Mountains (to the west and north) serve as visual backdrops. Solar facilities within the northern part of the SEZ would be seen at the base of McIntyre Ridge. See Figure 3.6-3.

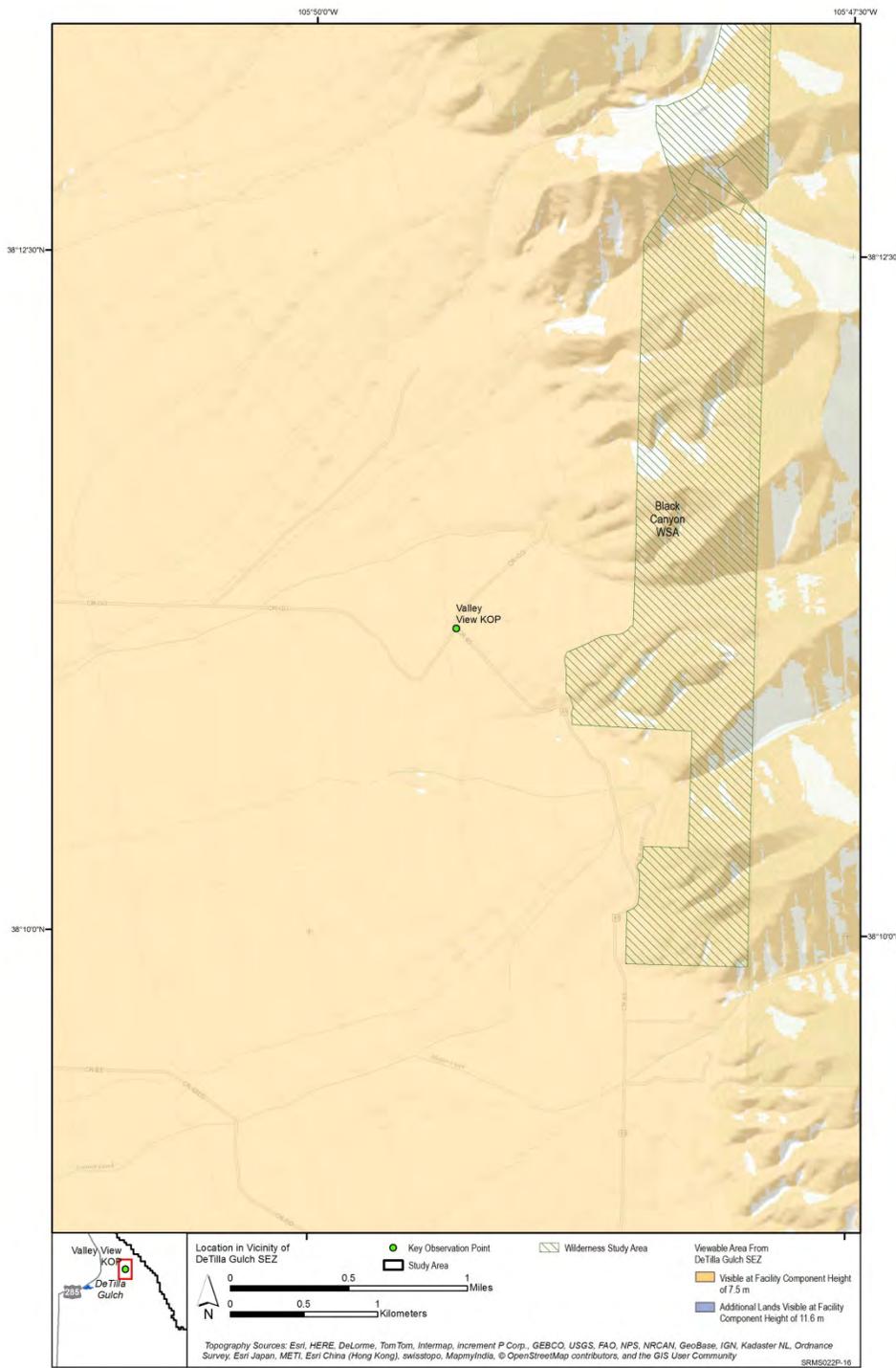
*Cultural Modifications Visible within the KOP Viewshed:* Homes and other community buildings, farm structures, agricultural fields, roads, road signage.

*Direction of View toward SEZ:* WSW

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approx. 9°. See Figure 3.6-4.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire De Tilla Gulch SEZ is within the GIS-calculated viewshed of the KOP.

*Orientation of the solar energy development within the field of view:* The De Tilla Gulch SEZ is to the left of approximate center of the view.



**Figure 3.6-2 Viewshed from De Tilla Gulch SEZ, including Valley View Hot Springs/Orient Land Trust, Black Canyon WSA KOP**



**Figure 3.6-3 Photograph of Existing Landscape from Valley View KOP Looking toward De Tilla Gulch SEZ**



**Figure 3.6-4 Google Earth Schematic Visualization of De Tilla Gulch SEZ as Seen from Valley View KOP**

### 3.6.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Valley View KOP on August 14, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.6-1.

**Table 3.6-1 Visual Contrast Rating for Valley View KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√				√				√
	Line				√				√			√	
	Color				√				√		√		
	Texture				√			√					√

The overall contrast rating for the Valley View KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

The presence of parabolic trough facilities within the SEZ would be likely to result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources.

During glare incidents the degree of contrast could be *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the De Tilla Gulch SEZ would be visible at a distance of 10 to 13 mi from the closest point on the OLT property and 9.7 to 12.2 mi from the closest point in the Black Canyon WSA. This distance is in the BLM background distance zone; however, it is close enough that the shapes and colors of structures within the SEZ would likely be visible. Surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements.
- **Angle of Observation.** The KOP is on a slope that rises toward the east, such that the KOP looks slightly downward to the SEZ. This would slightly increase visibility of solar facilities within the SEZ; however, the angle of view is still very low, and solar facilities would be visible as a very narrow band at the foot of, but extending beyond the end of McIntyre Ridge. Because of the distance and low angle of view, it is unlikely that persons not familiar with the nature of the SEZ and its location would recognize it as consisting of solar facilities, if it was noticed at all.
- **Length of Time the Project Is In View.** Development in the SEZ would be visible to anyone engaging in outdoor activities within the OLT or the Black Canyon WSA. For employees of the OLT, solar development in the SEZ would be visible on a daily basis, and for visitors, it might be visible during relaxation activities. For persons travelling by vehicle away from the hot springs or the WSA, development within the SEZ could be visible for approximately 5 to 8 minutes depending on route and speed.
- **Relative Size or Scale.** Buildings within the SEZ would be far enough away that they would blend well with existing structures with respect to size. Because of the low viewing angle and the orientation of the SEZ with respect to the KOP, the apparent size of the SEZ would be greatly reduced. The SEZ would occupy approximately 9° of the horizontal field of view.

- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Contrasts would likely be lower when vegetation was darker in color, especially for PV facilities. Because of the open nature of the landscape between the KOP and the SEZ, defoliation of trees in the fall is not likely to change views of solar development in the SEZ substantially; however, for other locations in OLT and the Back Canyon WSA, defoliation of trees in the fall may reduce screening of the SEZ by foreground vegetation. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.
- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP (and the VSAs for which the KOP was selected) is generally east of the SEZ, incidence of glare from both PV and parabolic trough collector/reflector arrays would be expected in the morning hours, and might be relatively common. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view across the base of (and extending beyond) a somewhat distant low mountain ridge, with other mountains visible in a wide, sweeping panorama from south to north across the valley floor. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape.

- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.6.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The Valley View Hot Springs and larger Orient Land Trust provide educational, recreational, and relaxation opportunities for its visitors, and have identified protection of views from development and preservation of existing landscape character as important goals. Visitors and employees would be able to see industrial develop anytime they looks southwest from the western edge of the property, while conducting relaxation and recreation activities, and when driving away from the property. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Some visitors and employees might find the view of industrial-scale solar facilities unattractive and inappropriate for the atmosphere.

The Black Canyon WSA is managed for its wilderness characteristics. There are no roads in the WSA, and individuals who have made the effort to visit the WSA will likely be seeking solitude in a more natural setting. They will likely be participating in relaxation and recreation activities such as hiking, wildlife viewing, backpacking, and photography (BLM 2015) and would be able to see industrial development anytime they look southwest from many places in the WSA. Industrial development is inconsistent with the natural-appearing visual character of the surrounding landscape and goals for wilderness experiences. Some visitors might find the view of industrial-scale solar facilities unattractive and out-of-place.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the De Tilla Gulch SEZ would be visible to persons in many locations within both OLT and Black Canyon WSA, with unobstructed views looking directly at the SEZ. Because of the low height of the facilities, and the low angle of view, the solar facilities could be missed by some casual observers; however, some casual observers would likely notice the contrasting color of the solar arrays. PV facilities in the SEZ would be less likely to be noticed than parabolic trough facilities.

If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents would make them likely to be noticed by a casual observer, but because of the small apparent size of the SEZ (9°) and the large expanse of the view, they would not “begin to dominate the view” which would constitute a *moderate* contrast level. Regardless of solar

technology, during glare incidents, the bright reflected light would likely attract the attention of casual observers.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions.* Visitors to the OLT and the Black Canyon WSA would be considered to be sensitive viewers; persons driving through the area on average would be less sensitive, but would vary from low to high sensitivity. Solar development within the De Tilla Gulch SEZ would be visible to OLT and the Black Canyon WSA on a daily basis and potentially for extended viewing periods.

As seen from the Valley View KOP, solar development in the SEZ would appear as a thin horizontal band of dark or light color (depending on technology type and lighting) with very small angular forms of buildings visible projecting slightly above it at the base of McIntyre Ridge, and extending slightly beyond the end of the ridge.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes, combined with the small size of the SEZ, would make them unlikely to be noticed by some casual observers, but the color contrast between the black PV panels would likely be noticed by some viewers. Glare events might be common in the mornings at certain times of the year, and the bright reflections would likely be noticed by casual observers. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, and would cause very little light pollution.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night makes them substantially more visible than PV facilities, and, they would likely be noticeable to casual observers. However, given the viewing angle, and small size of the SEZ as seen from the OLT and WSA, having parabolic trough facilities in the SEZ would not “begin to dominate the view” and would not likely cause *moderate* levels of visual contrast under normal viewing circumstances.

#### *Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:*

Because the OLT and WSA do not have an unobstructed view of either the Antonito Southeast or De Tilla Gulch SEZs, no cumulative visual impacts from solar development within these SEZs is anticipated for viewpoints in or near these areas.

### **3.6.6 Regional Compensatory Mitigation Recommendation**

The visual contrast rating for the OLT and Black Canyon WSA indicated that solar development in the De Tilla Gulch SEZ would clearly be visible, but would occupy only a small part of the view, and would create weak visual contrasts overall, under normal viewing conditions. Moderate levels of visual contrast could occur during glare incidents, which would be expected to occur in mornings at certain times of the year, but would be of relatively brief duration. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur in the OLT and Black Canyon WSA as a result of solar development in the De Tilla Gulch SEZ.

### **3.7 Old Spanish National Historic Trail (Representative KOPs: De Tilla Gulch South, Liberty Trailhead)**

#### **3.7.1 VSA Description**

**VSA Type:** Specially Designated Area

**Potentially Impacting SEZ:** De Tilla Gulch SEZ

**Distance from SEZ to Affected Area within VSA:** The North Fork of the Old Spanish Trail (OST) passes within approximately 0.4 miles of the southern boundary of the western portion of the SEZ. Within the 25 mi viewshed of the SEZ, the most distant point on the OST within the GIS-calculated viewshed is 25 mi from the SEZ. There is scattered visibility of the SEZ from points on the OST beyond 25 mi; however, no significant visual contrasts are expected beyond 25 mi. See Figure 3.7-1.

**Affected Area within the VSA:** The SEZ is located on a slight southeast-facing slope, north of the OST. Early trails were not single-track routes, but rather travel corridors in which the route of travel varied due to the type of pack animal or vehicle used as well as weather conditions and it is possible that one or more variants of the OST may have crossed the SEZ. The original boundary of the proposed SEZ was adjusted to maintain a ¼-mile buffer from the trail. Approximately 30 mi of the Old Spanish Trail is located within the GIS-calculated viewshed of the SEZ.

**Estimated Annual Visitation/Usage in VSA:** Annual visitation information for the OST is not available; however, usage in the area is thought to be low.

**Types of Activities within the Affected Area:** Driving, ranching, farming, recreation, and other activities associated with living in small communities.

**Estimated proportion of visitors conducting each major activity type:** Vehicular travel estimates for local roads are not available, but much of the traffic in this area is local. It is likely that more than 99% of viewers would be drivers or passengers in vehicles travelling through the area. The remaining 1% would be permanent residents, farm workers, or those specifically exploring the OST.

**Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:** The OST is a congressionally designated historic trail and is promoted as a tourist attraction by state and local Chambers of Commerce, tourist boards and the Old Spanish Trail Association. Development of the *Comprehensive Management Plan and Environmental Impact Statement for the Old Spanish National Historic Trail* is currently under way.

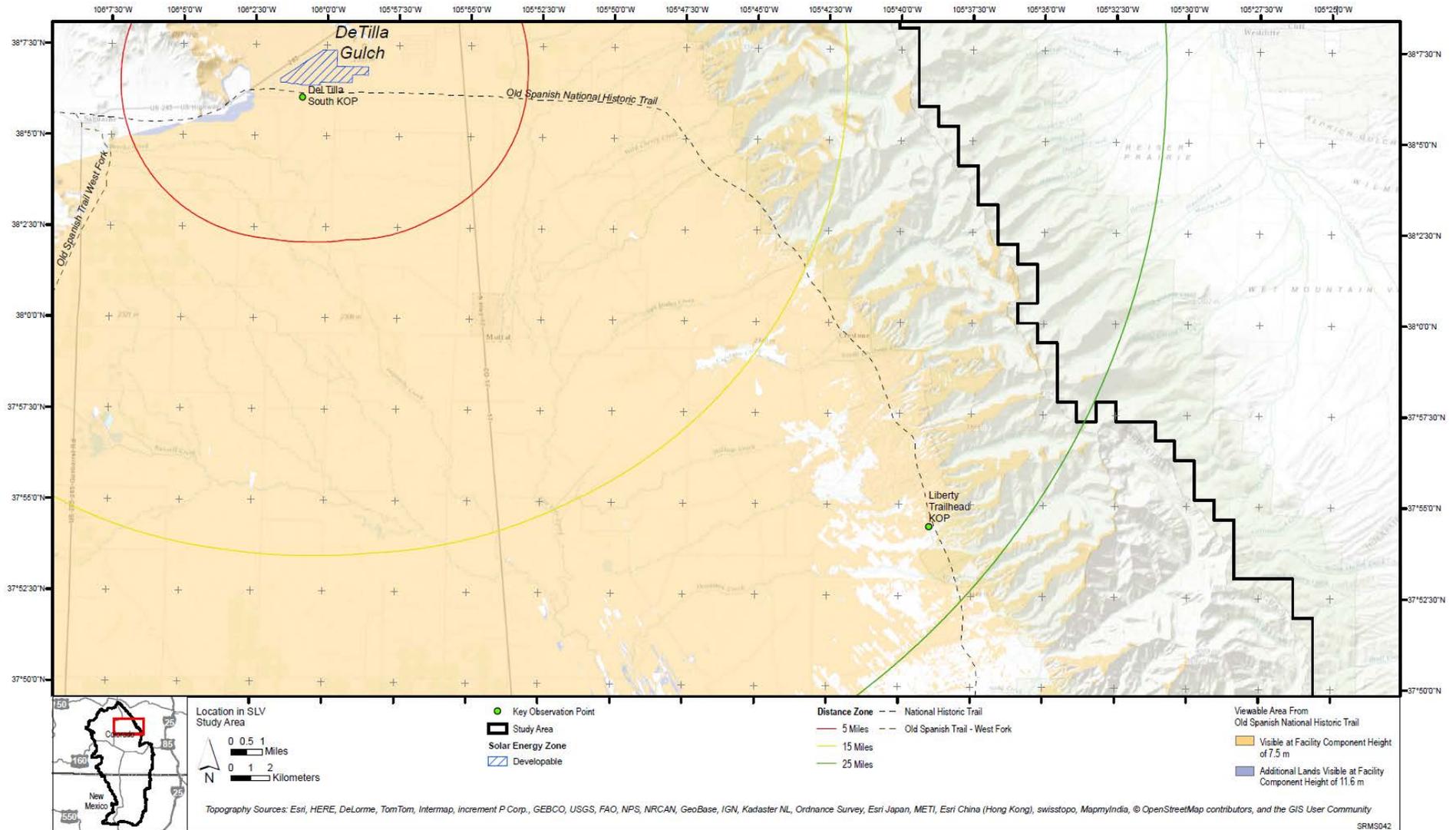


Figure 3.7-1 Old Spanish National Historic Trail and Viewshed of De Tilla Gulch SEZ

## **3.7.2 Summary of Impacts to KOPs**

### **3.7.2.1 Introduction**

Two representative KOPs (De Tilla South and Liberty Trailhead) were used to analyze impacts to the OST. The basis for deciding if regional compensatory mitigation for visual impacts to the OST is warranted would consider impacts to the representative KOPs and other points on the OST from which solar facilities in the SEZ would be visible, and the cumulative impacts of sequential or simultaneous views of solar facilities in the SEZs. Impacts to the De Tilla South KOP are discussed in detail in Section 3.3. Impacts to the Liberty Trailhead KOP are discussed in detail in Section 3.4. Impacts to the OST as a whole are discussed in the draft Solar PEIS (BLM 2010), and are summarized in Section 3.7.2.4 below. Cumulative impacts from solar energy development in the SEZs only, are discussed in Section 3.7.3 below.

### **3.7.2.2 Summary of Impacts to De Tilla Gulch South Representative KOP**

The De Tilla South KOP is a point on or very near to the North Fork of the Congressionally Designated Old Spanish Trail. It is located approximately 0.4 mi south of the De Tilla Gulch SEZ at the intersection of County Road AA and County Road 54.

A BLM visual contrast rating was conducted for the De Tilla South KOP on August 14, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The overall contrast rating for the De Tilla South KOP is *Strong*, corresponding most closely to the VRM Class IV objective.

Travelers on the OST in the vicinity of the De Tilla Gulch SEZ would include residents, tourists, and other visitors to the Valley who would vary widely in their sensitivity to the visual contrast of solar facilities within the SEZ, with tourists and residents likely to be more sensitive than others. A small percentage of viewers would be exploring the OST. Solar facilities within the SEZ would appear very large with respect to other objects visible in the landscape, and would occupy a large part of the field of view. The details of the complex but highly regular geometry of the solar array would be apparent, and would contrast strongly with the “organic” appearance of the surrounding existing shrub vegetation. The black PV panels or silver surfaces of parabolic trough mirrors would contrast strongly with the grays, greens, tans, and other hues of the existing vegetation. As travelers passed the SEZ, the angles of view and lighting on solar facilities would change, and dramatic changes in the appearance of the facilities could occur, adding to the overall contrast created by the facilities.

Glare events could occur, especially from parabolic trough facilities, and could cause annoyingly bright reflections. Lighting associated with solar facilities within the SEZ would be visible, and for parabolic trough facilities, could be prominent, even with good mitigation.

### 3.7.2.3 Summary of Impacts to Liberty Trailhead Representative KOP

The Liberty Trailhead/OST KOP is located in the Liberty Trailhead parking lot, at a point on or very near to the East Fork of the OST, approximately 22.8 mi from the southeast corner of the De Tilla Gulch SEZ.

A BLM visual contrast rating was conducted for the Liberty Trailhead KOP on August 14, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The overall contrast rating for the Liberty Trailhead KOP is *Weak*, corresponding most closely to the VRM Class II objective.

Users of the Liberty Trail would be considered to be sensitive viewers; however, because of the distance to the SEZ, the very small apparent width of the SEZ, the low height of the facilities, and the very low angle of view, expected visual contrast would be weak. Solar development in the SEZ would be visible to persons at the Liberty Trailhead/OST KOP and on the Liberty Trail, but would be missed by most casual observers. This would particularly be true if development was limited to PV facilities, but still likely if parabolic trough facilities were located within the SEZ. Lighting at the solar facilities would likely be visible at night, but because of the long distance from the KOP to the SEZ, would blend in with other visible lights and would not be a significant source of visual contrast.

### 3.7.2.4 Summary of Impacts to Other Locations on the OST

A detailed assessment of potential visual impacts to those portions of the OST within the De Tilla Gulch SEZ was provided in the Draft Solar PEIS (2010). The analysis in the Draft Solar PEIS includes potential impacts of solar power towers, which are not under consideration for siting within the SEZs, and are not included in the current analysis.

Visual contrasts expected to be observed by users of the OST within the viewshed of the De Tilla Gulch SEZ can be summarized as follows: Within the SEZ 25-mi viewshed, solar facilities could be visible from the trail starting approximately 25 mi southeast of the SEZ to approximately 1 mi west of the SEZ, with two additional very small areas of partial visibility of the SEZ at 1.8 and 2.7 mi west of the SEZ respectively. Approximately 7.9 mi of the southeastern most portion of the Old Spanish National Historic Trail within the 25-mi viewshed has been designated as a high-potential segment; however, this section of the OST would be subject to only weak visual contrasts from solar development within the SEZ, primarily because of the long distance from the area to the SEZ.

Trail users approaching the SEZ from the east would likely have intermittent views of the SEZ and solar facilities within the SEZ as they traveled generally north-northwest along the trail from distances exceeding 25 mi from the SEZ to approximately 12 mi from the SEZ, where the trail turns westward and gradually slopes downward toward the valley bottom. Because of the

undulating terrain along the trail route as it crosses the foothills of the Sangre de Cristo range, the SEZ would be in view briefly and repeatedly as trail users crossed rises; then the SEZ would disappear from view as trail users traversed low areas between the rises. At these relatively long distances, solar energy development within the SEZ would be expected to result in weak visual contrasts with the surrounding landscape, as viewed from the trail.

After the Old Spanish National Historic Trail turns west to approach the SEZ from the east, the trail passes through an agricultural area, parallels and crosses roads, and crosses a transmission line ROW. Other cultural modifications, including a landfill located east of the SEZ would likely be visible.

The valley floor is flat, with little possibility of screening from vegetation, so views of the SEZ are open, and trail users approaching from the east would have extended views of the SEZ as they approached and passed the SEZ. Where views are open, trail users distant from the SEZ would generally see solar facilities located in the SEZ close to the center of their field of view as they looked down the trail, causing weak visual contrasts with the surrounding landscape. As viewers approached the SEZ, the facilities would appear farther away and north from the center of the field of view looking down the trail. The facilities would appear to be larger and more detailed and would have greater contrast with their surroundings. The associated visual contrast levels would be expected to increase as trail users approached the SEZ, rising from weak through moderate to strong as trail users passed the SEZ at a distance of 0.4 mi from the southern boundary of the SEZ, near the De Tilla South SEZ.

Old Spanish National Historic Trail users approaching the De Tilla Gulch SEZ from the west would not see the SEZ or solar facilities within the SEZ until they passed approximately 2.7 mi west of the SEZ, where there would be very brief intermittent visibility until travelers reached approximately 1.1 mi west of the SEZ.

As trail users passed the south side of Rattlesnake Hill near the southern end of McIntyre Ridge, solar facilities in the southern portion of the SEZ would abruptly come into view. As trail users passed the extreme southern tip of McIntyre Ridge (approximately 1.8 mi west of the SEZ), the entire SEZ would come into view. At the relatively short distance involved, utility scale solar facilities would likely cause strong visual contrasts.

### **3.7.3 Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs**

In the vicinity of the De Tilla Gulch SEZ, users of the OST would not have an unobstructed view of either the Antonito Southeast or Los Mogotes East SEZs, therefore no cumulative visual impacts from solar development within these SEZs is anticipated in the area where users would experience strong visual contrasts from solar development within the SEZ. Farther south in the San Luis Valley, the OST may have direct views of portions of the Antonito Southeast SEZ and the Los Mogotes East SEZ; however, if these views exist, given the long distance from the OST

to the other two SEZs, no non-negligible cumulative visual impacts from solar facilities within the SEZs would be expected.

### **3.7.4 Regional Compensatory Mitigation Recommendation**

Two representative KOPs were used to analyze impacts to the OST, and these analyses were supplemented by the analysis of visual contrasts in the Draft Solar PEIS. These analyses show that users of the OST would be subjected to strong visual contrasts as they approached the SEZ, especially from the east, where there is a long stretch of the OST with unobstructed views of the SEZ. Some development is visible in the area, including U.S. 285 and a small landfill; however, the overall visual impression of the area is a rural setting with widely scattered farm and ranch buildings, with a mostly natural appearing backdrop of hills or mountains. The presence of one or more utility-scale solar facilities in a location only a short distance from the OST will create a strong source of visual contrast visible from the OST, and the presence of industrial facilities in the rural visual setting is inconsistent with the area's landscape character and the historic character of the OST. Even higher levels of visual contrast could occur during glare incidents, and because the OST is south of the SEZ, glare incidents would be expected to occur at certain times of the day/year, and for persons traveling along the trail using slower transportation modes, e.g., hiking or biking, extended views of glare at short viewing distances would be possible. As a result, regional compensatory mitigation is recommended as compensation for potential visual impacts that might occur to the OST as a result of solar development in the De Tilla Gulch SEZ.

### 3.8 Community of La Jara

#### 3.8.1 VSA Description

*VSA Type:* Community

*Potentially Impacting SEZ:* Los Mogotes East SEZ

*Distance from SEZ to Affected Area within VSA:* Approx. 5.2 mi from closest point in VSA to closest point in the SEZ. Approx. 9.6 mi from closest point in VSA to farthest point in the SEZ. See Figure 3.8-1.

*Affected Area within the VSA:* The SEZ is located on an east-facing slope southwest of La Jara. There is no view of the SEZ from “downtown” La Jara due to screening by vegetation and structures. As a result, visibility from La Jara is limited to primarily the southern and western sides of the community, and residents in these areas would be more likely to see solar development within the SEZ, on average. At the southern and western edges of La Jara, and while traveling south on Highway 285 towards Romeo or west on CO-136 at the southern edge of La Jara, the SEZ is in nearly full view. The SEZ is also in view when traveling west on Highway 15, just north of La Jara. This KOP and the Romeo KOP were selected as representative KOPs for the area from La Jara through Bountiful to Romeo.

*Estimated Annual Visitation/Usage in VSA:* The population of La Jara is 819 people (US Census 2013). In addition, large numbers of persons passing through La Jara would see the SEZ while driving. CDOT estimates that 6,200 vehicles per day travel on U.S. 285 through La Jara. An additional 1,400 vehicles travel on CO-136 along the southern edge of La Jara. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 4.3 million, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

*Types of Activities within the Affected Area:* Driving, walking, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that 6,200 vehicles per day travel on U.S. 285 through La Jara. An additional 1400 vehicles travel on CO-136 along the southern edge of La Jara. The population of La Jara is 819 people (US Census 2013). Thus, more than 99% of viewers would be drivers or passengers in vehicles passing through the area. Less than 1% would be permanent residents of La Jara. A very small but unknown percentage of travelers through La Jara would likely stop in La Jara, and potentially be exposed to views of the SEZ during their visit.

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* No master plan was found for La Jara. Currently, the affected area of La Jara is in residential use.

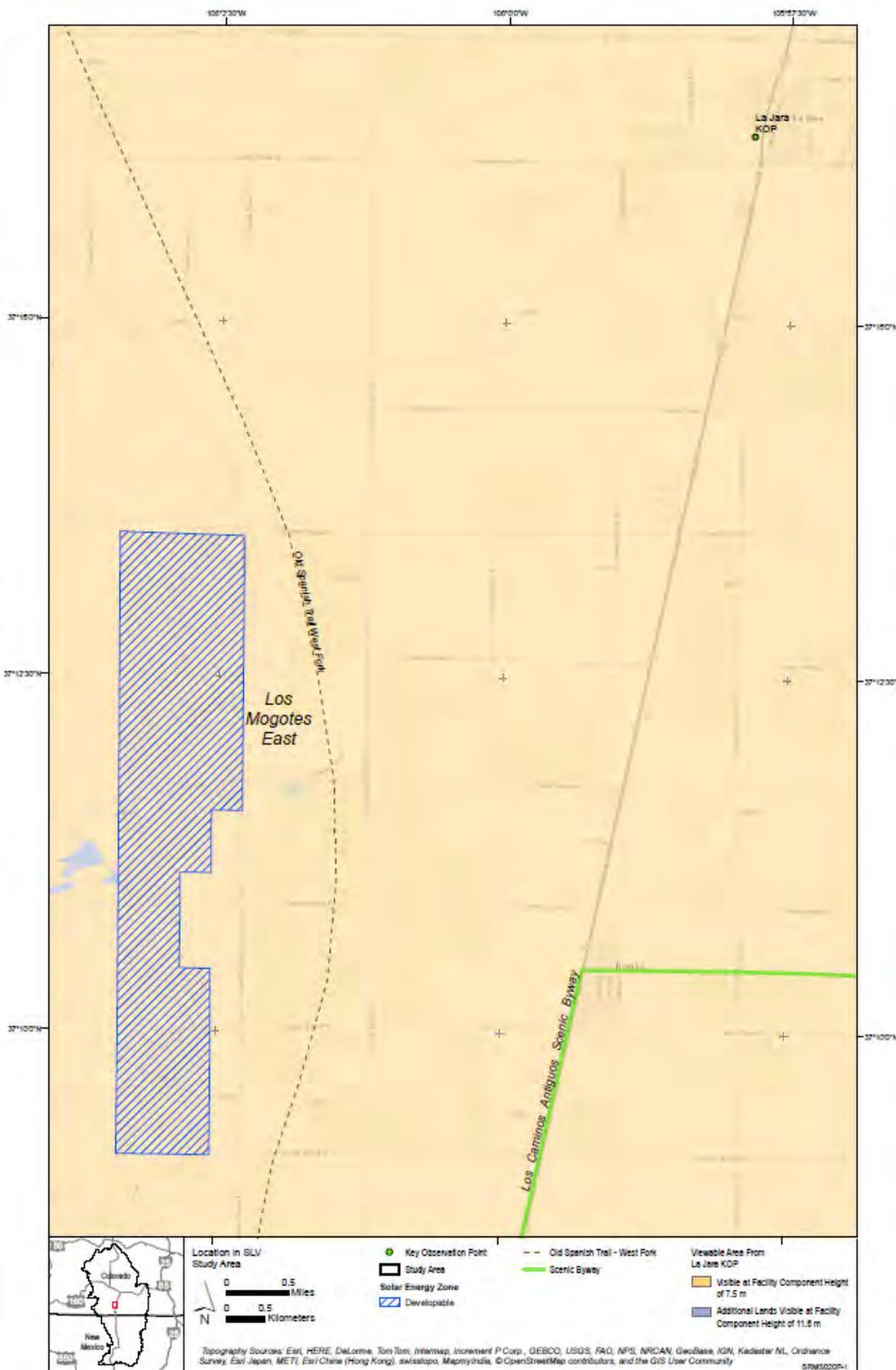


Figure 3.8-1: Viewshed from La Jara KOP, including Los Mogotes East SEZ

### 3.8.2 KOP Description

*KOP Name:* La Jara

*KOP Location:* Representative KOP is located at the end of Mulberry Street at the south end of town one block west of 285.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* This KOP was selected as a representative view towards Los Mogotes SEZ from La Jara and nearby areas, including the view from U.S. Highway 285 through Bountiful to Romeo and from surrounding highways.

*KOP Access Modes:* Primarily automobile, truck, and foot.

### 3.8.3 Visual Context

*General Description:* Looking southwest towards Los Mogotes SEZ from western edge of La Jara. View of grasslands and scattered ranches with low mountain ridge backdrop. View bounded on both sides by small town development. See Figure 3.8-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes and other community buildings, farm structures, fences, agricultural fields.

*Direction of View toward SEZ:* SW

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* ~33°. See Figure 3.8-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire SEZ is within the GIS-calculated viewshed of the KOP; however, scattered trees and shrubs provide minor screening elements between La Jara and SEZ.

*Orientation of the solar energy development within the field of view:* The SEZ is slightly to the left of approximate center of view.



**Figure 3.8-2 Photograph of Existing Landscape from La Jara KOP Looking toward Los Mogotes East SEZ**



**Figure 3.8-3 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from La Jara KOP**

### 3.8.4 Visual Contrast Rating

A BLM visual contrast rating was conducted for the La Jara KOP on August 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.8-1.

**Table 3.8-1 Visual Contrast Rating for La Jara KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√					√			√	
	Line			√					√			√	
	Color			√					√			√	
	Texture				√				√			√	

The overall contrast rating for the La Jara KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

The presence of parabolic trough facilities within the SEZ would be likely to result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources.

During glare incidents the degree of contrast could be *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible at a distance of between 5.2 and 9.6 mi from the closest point in La Jara. This distance is in the BLM background distance zone; however, it is close enough that the shapes and colors of structures within the SEZ would be visible. Surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements.
- **Angle of Observation.** The SEZ is on a slight slope that rises toward the west, such that the western edge is tilted slightly upward toward the viewer, as seen from La Jara. This would slightly increase visibility of solar facilities within the SEZ; however, the angle of view is still very low, and solar facilities would be visible as a very narrow band at the foot of a low ridge, with some slight screening by foreground vegetation. Because of the distance and low angle of view, it is unlikely that persons not familiar with the nature of the SEZ and its location would recognize it as consisting of solar facilities.
- **Length of Time the Project Is In View.** For residents and visitors to La Jara, views could be extended; for residents, solar developments in the SEZ would be visible on a daily basis, in some cases from resident’s yards, and from some streets in town. For persons driving local roads, visibility would be brief, typically a few minutes, depending on route and location.
- **Relative Size or Scale.** Buildings within the SEZ would be far enough away that they would blend well with existing structures. Because of the low viewing angle, the apparent size of the SEZ would be greatly reduced, but would still spread across a substantial portion of the horizontal field of view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create strong color contrasts

with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Because of the open nature of the landscape between La Jara and the SEZ, and because some foreground vegetation is evergreen, defoliation of trees in the fall is not likely to change views of solar development in the SEZ substantially, but may slightly reduce screening of the SEZ by foreground vegetation. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because La Jara is north of the SEZ, incidence of glare from the collector array would be substantially reduced for PV facilities, but might still be observed from parabolic trough arrays. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view across the base of a somewhat distant low ridge. Depending on the viewer locations, there might be some framing of the view by foreground elements that would focus visual attention on the solar developments within the SEZ, but the framing would generally be weak. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape.

- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but because of the relatively short distance from La Jara to the SEZ, are not expected to greatly affect facility visibility on most days.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.8.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* La Jara is a small community in a rural area with substantial views of largely rural and natural-appearing landscapes. Residents of La Jara would be able to see industrial development in the SEZ anytime they look to the southwest from the southern and western portions of their community, and when driving through the local area. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Some residents might find the view of industrial-scale solar facilities unattractive and inappropriate.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be visible to persons in the southern and western portions of La Jara with unobstructed views looking directly at the SEZ, but because of the low height of the facilities, the low angle of view, and the presence of screening elements would likely be missed by most casual observers. This would particularly be true if development was limited to PV facilities.

If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents could make them likely to be noticed by a casual observer. Regardless of solar technology, during glare incidents, the bright reflected light would likely attract the attention of casual observers.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* The residents of La Jara would be considered to be sensitive viewers; persons driving through La Jara on average would be less sensitive, but would vary from low to high sensitivity. Solar development within the SEZ would be visible to residents on the southern and western edges of town on a daily basis and potentially for extended viewing periods. The other residents would likely view solar development in the SEZs briefly while driving to and from their homes. A very large number of persons would also see solar development in the SEZ very briefly while driving through La Jara.

As seen from La Jara, solar development in the Los Mogotes East SEZ would appear as a thin horizontal band of dark or light color (depending on technology type and lighting) with very small angular forms of buildings visible projecting slightly above it at the base of the Los Mogotes Peaks. The dark or light band would extend substantially northwards and to a lesser degree southwards from the peaks. The thin band of the solar arrays would be partially obscured by shrubs, small trees, and structures in the foreground of views from La Jara.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color (especially as seen from the north, where views would generally be looking at the shadowed backs of the solar arrays), and lack of visible water vapor plumes would make them unlikely to be noticed by casual observers. An exception would be when glare events occurred and caused bright reflections which would likely be noticed by casual observers. Glare events would likely be rare because La Jara is north of the SEZ and the PV panels in tracking systems would generally face east, west, and south, and non-tracking systems would face south only. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, and cause very little light pollution.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night makes them substantially more visible than PV facilities, and depending on their number and locations within the SEZ, they could be noticeable to casual observers. However, given the viewing angle, distance, and screening, having parabolic trough facilities in the SEZ would not likely cause moderate levels of visual contrast under normal viewing circumstances for viewers in La Jara.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Because La Jara does not have an unobstructed view of either the Antonito Southeast or De Tilla Gulch SEZs, no cumulative visual impacts from solar development within these SEZs is anticipated for viewpoints in or near La Jara.

### **3.8.6 Regional Compensatory Mitigation**

Because of screening by buildings and vegetation, solar energy development in the Los Mogotes SEZ would not be visible from most locations in La Jara. Visibility of solar development in the SEZ would be limited to the western and southern edges of the community. Furthermore, the visual contrast rating for the La Jara KOP indicated that solar development in the Los Mogotes East SEZ would create weak visual contrasts overall, under normal viewing conditions. Moderate levels of visual contrast could occur during glare incidents, but because La Jara is northeast of the SEZ, glare incidents would be expected to be relatively rare. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur in the community of La Jara as a result of solar development in the Los Mogotes East SEZ.



### 3.9 Community of Sanford

#### 3.9.1 VSA Description

*VSA Type:* Community

*Potentially Impacting SEZ:* Los Mogotes East SEZ

*Distance from SEZ to Affected Area within VSA:* Approx. 7.3 mi from closest point in VSA to closest point in the SEZ. Approx. 11.3 mi from closest point in VSA to farthest point in the SEZ. See Figure 3.9-1.

*Affected Area within the VSA:* The SEZ is located on an east-facing slope west-southwest of Sanford. The SEZ is not visible from much of Sanford because of screening by vegetation and structures, but there are some relatively unobstructed views from the southern and western edges of Sanford. The SEZ is also visible from Highway 136 between La Jara and Sanford while traveling west.

*Estimated Annual Visitation/Usage in VSA:* The population of Sanford is 879 people (US Census 2010). In addition, people passing through Sanford would see the SEZ while driving. CDOT estimates that 1,200 vehicles pass through Sanford each day. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 679,000, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

*Types of Activities within the Affected Area:* Driving, walking, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that 1,200 vehicles per day travel on Main Street through Sanford. The population of Sanford is 879 people (US Census 2010). Thus, the majority of viewers would be drivers or passengers in vehicles passing through the area, some of which are permanent residents of Sanford. A very small but unknown percentage of other travelers through Sanford would likely stop in Sanford, and potentially be exposed to views of the SEZ during their visit.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* No master plan was found for Sanford. Currently, the affected area of Sanford is in residential use.

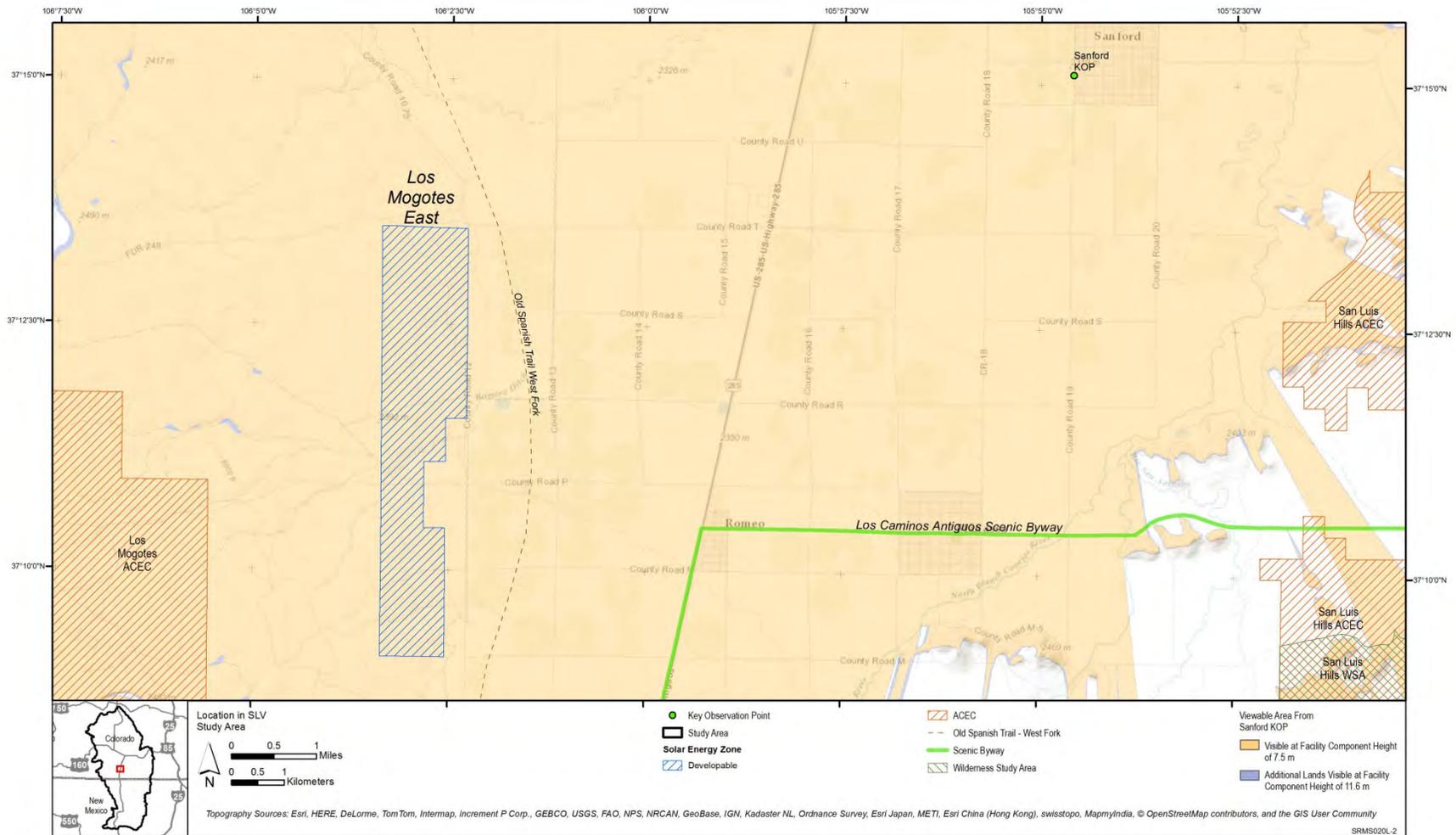


Figure 3.9-1: Viewshed from Sanford KOP, including Los Mogotes East SEZ

### 3.9.2 KOP Description

*KOP Name:* Sanford

*KOP Location:* Representative KOP is located on the west side of the “T” intersection of 1<sup>st</sup> St. and Kalmia St. (4<sup>th</sup> St) near the southwest corner of Sanford.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* This KOP was selected as a representative view towards Los Mogotes SEZ from Sanford and nearby areas.

*KOP Access Modes:* Primarily automobile, truck, and foot.

### 3.9.3 Visual Context

*General Description:* Looking southwest towards Los Mogotes SEZ from southwestern corner of Sanford. onto an open valley floor of agricultural fields and scattered agricultural structures. A low mountain ridge backdrop is visible beyond a distant line of trees. See Figure 3.9-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, fences, agricultural fields, communication towers, roads, and distribution lines.

*Direction of View toward SEZ:* SW

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* ~31°. See Figure 3.9-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire SEZ is within the GIS-calculated viewshed of the KOP; however, scattered trees and shrubs provide minor screening elements between Sanford and the Los Mogotes SEZ.

*Orientation of the solar energy development within the field of view:* The SEZ is slightly to the left of approximate center of view.



**Figure 3.9-2 Photograph of Existing Landscape from Sanford KOP Looking toward Los Mogotes East SEZ**



**Figure 3.9-3 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from Sanford KOP**

### 3.9.4 Visual Contrast Rating

A BLM visual contrast rating was conducted for the Sanford KOP on August 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.9-1.

**Table 3.9-1 Visual Contrast Rating for Sanford KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√					√			√	
	Line			√					√			√	
	Color			√					√			√	
	Texture				√				√			√	

The overall contrast rating for the Sanford KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

The presence of parabolic trough facilities within the SEZ would be likely to result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources.

During glare incidents the degree of contrast could be *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible at a distance of between 7.3 and 11.3 mi from the closest point in Sanford. This distance is in the BLM background distance zone; however, it is close enough that the shapes and colors of structures within the SEZ would sometimes be visible. Surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements.
- **Angle of Observation.** The SEZ is on a slight slope that rises toward the west, such that the western edge is tilted slightly upward toward the viewer, as seen from Sanford. This would slightly increase visibility of solar facilities within the SEZ somewhat; however, the angle of view is still very low, and solar facilities would be visible as a very narrow band at the foot of a low ridge, with some slight screening by foreground vegetation, particularly when deciduous trees would be leafed out. Because of the distance and low angle of view, it is very unlikely that persons not familiar with the nature of the SEZ and its location would recognize it as consisting of solar facilities.
- **Length of Time the Project Is In View.** For residents and visitors to Sanford, views could be extended; for residents, solar developments in the SEZ would be visible on a daily basis, in some cases from resident’s yards, and from some streets along the western or southern edge of the community. For persons driving local roads, visibility would be brief, typically a few minutes, depending on route and location.
- **Relative Size or Scale.** Buildings within the SEZ would be far enough away that they would blend well with existing structures. Because of the low viewing angle, the apparent size of the SEZ would be greatly reduced, but would still spread across a substantial portion of the horizontal field of view.

- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ could create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.
- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because Sanford is slightly north of the SEZ, incidence of glare from the collector array would be reduced for PV facilities except during late spring and early summer, but might still be observed from parabolic trough arrays. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Given the other lights between Sanford and the SEZ, the additional lighting from solar facilities in the SEZ would not likely add substantially to lighting impacts.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view across the base of a somewhat distant low ridge. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but because of the

moderate distance from Sanford to the SEZ, are not expected to greatly affect facility visibility on clear days.

- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.9.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Sanford is a small community in a rural area with substantial views of primarily agricultural landscapes. Some residents of Sanford would be able to see industrial development in the SEZ anytime they looked to the southwest from the southern and western portions of their community, and when driving through the local area. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Some residents might find the view of industrial-scale solar facilities unattractive and inappropriate.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be visible to persons in the southern and western portions of Sanford with unobstructed views looking directly at the SEZ, but because of the low height of the facilities, the low angle of view, and the presence of screening elements would likely be missed by most casual observers. This would particularly be true if development was limited to PV facilities.

If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents could make them more likely to be noticed by a casual observer. Regardless of solar technology, during glare incidents, the bright reflected light would likely attract the attention of casual observers.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* The residents of Sanford would be considered to be sensitive viewers; persons driving through Sanford on average would be less sensitive, but would vary from low to high sensitivity. Solar development within the SEZ would be visible to residents on the southern and western edges of town on a daily basis and potentially for extended viewing periods. The other residents would likely view solar development in the SEZs briefly while driving to and from their homes. A large number of persons would also see solar development in the SEZ very briefly while driving along the western or southern edges of Sanford.

As seen from Sanford, solar development in the Los Mogotes East SEZ would appear as a thin horizontal band of dark or light color (depending on technology type and lighting) with very

small angular forms of buildings visible projecting slightly above it, starting at the base of the Los Mogotes Peaks, and extending substantially northwards from the peaks. The thin band of the solar arrays would be partially obscured by trees and structures between Sanford and the SEZ.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them unlikely to be noticed by casual observers. An exception would be when glare events occurred and caused bright reflections which would likely be noticed by casual observers. Glare events would likely be rare because Sanford is slightly north of the SEZ and the PV panels in tracking systems would generally face east, west, and south, and non-tracking systems would face south only. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, and cause very little light pollution.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night could make them substantially more visible than PV facilities, and depending on their number and locations within the SEZ, they could be noticeable to casual observers. However, given the viewing angle, distance, and screening, having parabolic trough facilities in the SEZ would not likely cause moderate levels of visual contrast under normal viewing circumstances for viewers in Sanford.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Sanford does not have an unobstructed view of the De Tilla Gulch SEZ, which is too far from Sanford to cause visual impacts in any event. While viewshed analysis shows that a very small portion of the Antonito Southeast SEZ could potentially be visible from the Sanford KOP at a distance of approximately 15 mi, the horizontal angle of view of the visible portion of the SEZ would be approximately 2°, and the view would be almost certainly be screened by vegetation between Sanford and the Antonito Southeast SEZ. As a result, no cumulative visual impacts from solar development within the De Tilla Gulch and Antonito Southeast SEZs is anticipated for viewpoints in or near Sanford.

### **3.9.6 Regional Compensatory Mitigation**

Because of screening by buildings and vegetation, solar energy development in the Los Mogotes SEZ would not be visible from most locations in Sanford. Visibility of solar development in the SEZ would be limited to the western and southern edges of the community. Furthermore, the visual contrast rating for the Sanford KOP indicated that solar development in the Los Mogotes East SEZ would create weak visual contrasts overall, under normal viewing conditions. Moderate levels of visual contrast could be possible during glare incidents, but because Sanford is northeast of the SEZ, glare incidents would be expected to be relatively rare. As a result, regional offsite mitigation is not recommended as compensation for potential visual impacts that

might occur in the community of Sanford as a result of solar development in the Los Mogotes East SEZ.

### **3.10 Community of Romeo (Also Representative KOP for Los Caminos Antiguos Scenic and Historic Byway, and U.S. Highway 285, and Critical KOP for Veterans' Memorial).**

#### **3.10.1 VSA Description**

*VSA Type:* Community; point of interest

*Potentially Impacting SEZ:* Los Mogotes East SEZ

*Distance from SEZ to Affected Area within VSA:* The distance from the closest point in the community of Romeo to the closest point in the SEZ is approximately 2.9 mi. The distance from the closest point in the community of Romeo to the farthest point in the SEZ is approximately 6 mi. See Figure 3.10-1. Most of the SEZ is within the BLM foreground-middleground zone of 3-5 mi.

*Affected Area within the VSA:* The SEZ is located on an east-facing slope, due west of Romeo. In most parts of Romeo, the SEZ is at least partially screened by structures or vegetation. Visibility from Romeo is limited to primarily the western edge of the community and residents in these areas would be more likely to see the SEZ on average.

U.S. 285/CO-17 and CO-142, both of which pass through Romeo, are designated as part of the Los Caminos Antiguos Scenic and Historic Byway. For persons travelling south or north on U.S. 285 towards, Romeo, or west on CO 142 or on other local roads, the SEZ is in full view at times. The SEZ is also in full view from the veteran's memorial located on the west side of U.S. 285, approximately 0.28 mi north of the intersection of U.S. 285 and CO-142.

*Estimated Annual Visitation/Usage in VSA:* The population of Romeo is 404 people (US Census 2010). In addition, people passing through Romeo would see the SEZ while driving. CDOT estimates 3,500-4,000 vehicles pass through Romeo each day on U.S. 285. An additional 2,200 vehicles pass through Romeo on CO-142. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 3.2 to 3.5 million, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

*Types of Activities within the Affected Area:* Driving, walking, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that up to 6,200 vehicles per day pass through Romeo. The population of Romeo is 404 people (US Census 2010). Thus the majority of viewers would be drivers or passengers in vehicles passing through the area. Much of this traffic is likely to be local residents going to and from work, school, shopping, etc. with a few tourists going to Manassa to visit the Jack Dempsey museum, travelling the Los Caminos Antiguos Scenic and Historic Byway, or on to San Luis to visit a

local religious shrine, Fort Garland or the GSDNP. An unknown but likely very small percentage of travelers through Romeo would likely stop in Romeo, and potentially be exposed to views of the SEZ during their visit.

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* No master plan was found for Romeo. Currently, the affected area of Romeo is in residential use.

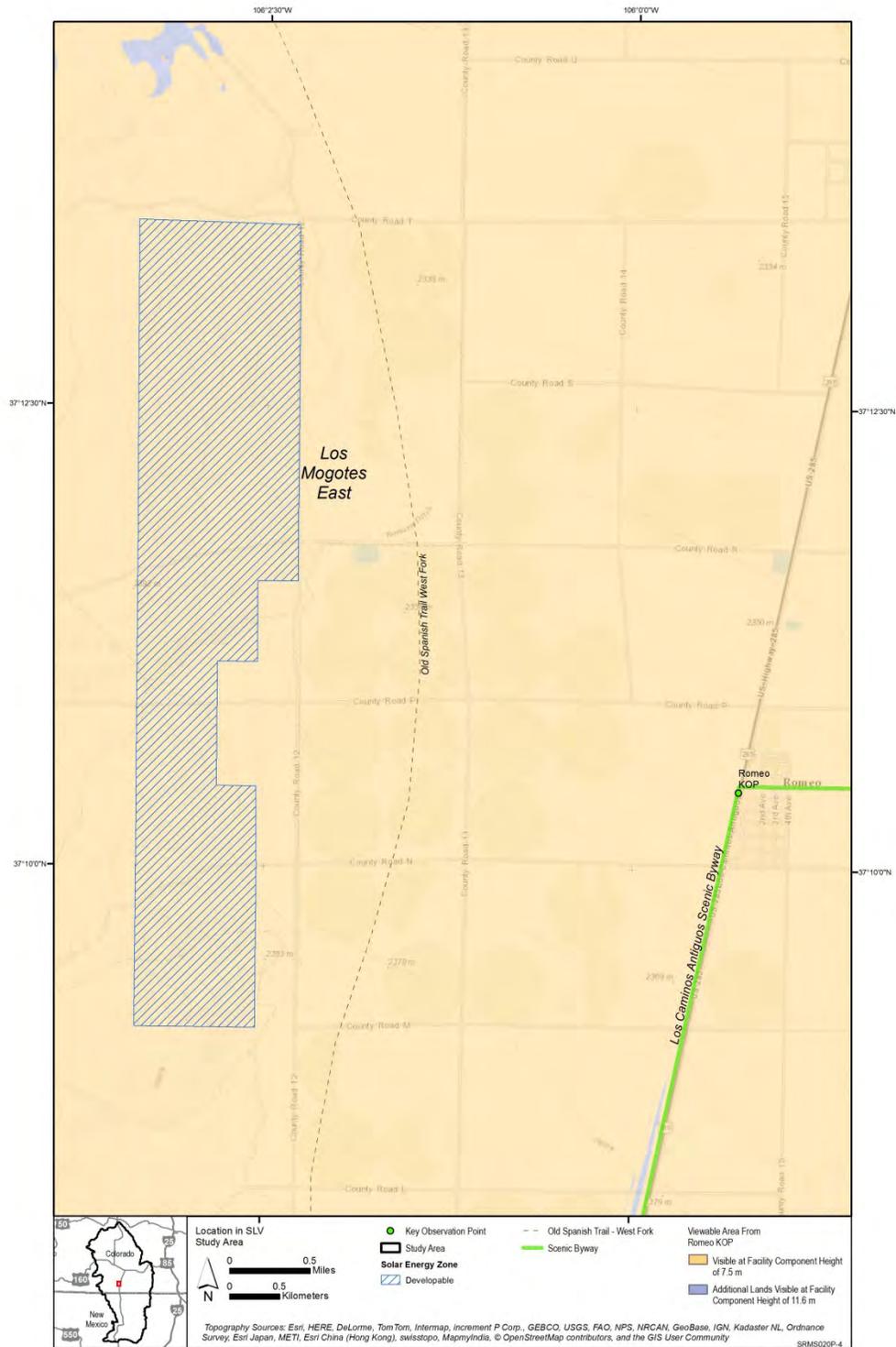


Figure 3.10-1: Viewshed from Romeo KOP, including Los Mogotes East SEZ

### 3.10.2 KOP Description

*KOP Name:* Romeo/Los Caminos Antiguos/U.S. 285/Veteran's Memorial KOP

*KOP Location:* This KOP is located at the west edge of Romeo, near the intersection of CO-142 and US-285. See Figure 3.10-1.

*Critical or Representative KOP:* Representative, critical.

*Critical Nature of Affected View (if applicable):* This KOP is located very close to the Veteran's Memorial in Romeo.

*Rationale for Selecting KOP:* This KOP was chosen as it is the only location in Romeo offering a clear view to the west and the Los Mogotes SEZ. Most of the SEZ is visible from this location as it is on a slope rising to the west, which places it partially above most objects that would provide screening. The view of the SEZ in other areas of Romeo is largely screened by structures or vegetation.

This KOP is also representative of the view of the Los Mogotes SEZ from the Los Caminos Antiguos Scenic and Historic Byway going south on US-285 into Antonito, and a considerable stretch of US-285 to the north as well from as other local Conejos County roads. This includes a veteran's memorial located on US-285, 0.28 mi north of Romeo. For more information on impacts to the Los Caminos Antiguos Scenic and Historic Byway, see Section 3.18.

*KOP Access Modes:* Automobile, truck, and foot.

### 3.10.3 Visual Context

*General Description:* Looking west towards Los Mogotes East SEZ from the western edge of Romeo. View of a generally open, agricultural/pastoral landscape with scattered ranches, below a partially forested mountain ridge backdrop. See Figure 3.10-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, fences, agricultural fields, roads, and distribution lines.

*Direction of View toward SEZ:* West, but with most of the SEZ north of due west.

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approx. 79°. Trees, shrubs, and structures provide partial screening between Romeo and SEZ. See Figure 3.10-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire SEZ is within the GIS-calculated viewshed of the KOP. Clumps of trees and shrubs, as well as structures screen portions of the view from the KOP toward the Los Mogotes SEZ; however, screening is spotty for views from some nearby locations on U.S. 285.

*Orientation of the solar energy development within the field of view:* The Los Mogotes East SEZ is partly in the center of the view, but the view of the SEZ is somewhat unbalanced, as the majority of the SEZ is to the right.



**Figure 3.10-2 Photograph of Existing Landscape from Romeo KOP Looking toward Los Mogotes East SEZ**



**Figure 3.10-3 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from Romeo KOP**

### 3.10.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Romeo KOP on Aug. 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.10-1.

**Table 3.10-1 Visual Contrast Rating for Romeo KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√					√			√	
	Line		√						√			√	
	Color		√						√		√		
	Texture			√					√			√	

The overall contrast rating for the Romeo KOP is *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

During glare incidents, contrasts would increase, potentially substantially, and because of the short distance to the facility, the glare contrast could strongly attract attention and might dominate the view at times, though it would be usually be relatively brief in duration. During glare incidents, contrast could rise above the *Moderate* level.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental

factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible between 3 and 6 mi from Romeo, but 3 and 5 mi from the Veteran's Monument and as close as 2.5 mi from the closest point on U.S. 285 just south of Romeo. This distance is mostly in the BLM foreground-middleground distance zone, which is close enough that the shapes and colors of structures within the SEZ would be visible. Surface details of structures could be visible, and solar collector/reflectors would generally be seen as individual elements in a large array.
- **Angle of Observation.** The SEZ is on a slight slope that rises toward the west, such that the western edge of the SEZ is tilted slightly upward toward the viewer, as seen from Romeo. This would slightly increase visibility of solar facilities within the SEZ; however, the angle of view is still very low, and solar facilities would be visible as a very narrow band at the foot of a distant, low mountain ridge, with some screening by foreground vegetation. Despite the low angle of view and partial screening by foreground vegetation and structures, because of the short distance to the SEZ, portions of facilities would often be plainly visible, and likely would be recognizable as solar facilities.
- **Length of Time the Project Is In View.** For residents and visitors to Romeo, views could be extended; for residents, solar developments in the SEZ would be visible on a daily basis, in some cases from resident's yards, and from some streets in town. For persons travelling on U.S. 285 near Romeo, facilities within the SEZ would be in view for several minutes, though all or portions of the SEZ would be screened at times. For person driving west on CO 142 from the edge of the Los Mogotes East SEZ viewshed, facilities within the SEZ would be visible for up to 10-15 minutes before reaching Romeo, though again, all or portions of the SEZ would be screened at times. For persons driving local roads, visibility would be typically last several minutes, depending on route and location. Development within the SEZ would be visible from the Veteran's Memorial, and thus might be visible for several minutes at that location.
- **Relative Size or Scale.** Solar facilities within the SEZ would be larger in horizontal extent than most other visible objects in the view. Because of the low viewing angle, the apparent size of the SEZ would be reduced, but would still spread across a large portion of the view (51°) to the west.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Defoliation of trees in the fall could increase visibility of solar facilities in the SEZ substantially. In certain conditions when air

temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because Romeo is east of the SEZ, glare might be observed from solar facilities in the SEZ. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night, given that there are very few existing lights visible on the ridge west of Romeo.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view at the foot of a nearby mountain ridge that is a focus of views in the general direction of the SEZ as seen from Romeo. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape; however, the blocky forms of structures within the solar facilities could be visible above the solar arrays, and could contrast noticeably with the softer and less rectilinear lines of the existing landscape.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but because of the relatively short distance between Romeo and the SEZ, would not affect visibility strongly on most days.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.10.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Romeo is a small community in a rural area with substantial views of agricultural and natural-appearing landscapes. Residents of Romeo would be able to see industrial development in the SEZ anytime they look to the west from the western portions of their community, and while driving through the local area. Most of the vehicular traffic is likely to be local residents going to and from work with few tourists passing through Romeo on their way to San Luis to visit a religious shrine or going to Manassa to visit the Jack Dempsey Museum. It is not unusual to see groups of motorcyclists at the Veteran's Memorial, located 0.25 mi north of Romeo on U.S. 285. Some local residents might be sensitive to the change in the landscape. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Some residents might find the view of industrial-scale solar facilities unattractive and inappropriate. Motorcyclists visiting the memorial may be sensitive to industrial development close to the memorial. Some tourists may be sensitive to a change in the natural and rural appearing landscape, especially if they are frequent visitors.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be plainly visible to persons on the western edge of Romeo with unobstructed views looking directly at the SEZ; however, views of all or some of the SEZ would be screened by vegetation and structures for most locations within Romeo. If parabolic trough facilities were located in the SEZ, the height of the reflector array, various buildings and other structures, presence of plumes under some conditions, and likelihood of glare incidents would attract visual attention, and make them unlikely to be missed by a casual observer; because of the relatively short distance from the KOP to the SEZ, even PV facilities would likely be noticed by casual observers. Regardless of solar technology, during glare incidents, the bright reflected light would likely attract the attention of casual observers, and because of the short distance, might be annoying to some people.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* The residents of Romeo would be considered to be sensitive viewers; persons driving through Romeo on average would be less sensitive, but would vary from low to high sensitivity. Solar development within the SEZ would be plainly visible to some residents on a daily basis and potentially for extended viewing periods. The other residents would likely view solar development in the SEZs briefly while driving to and from their homes. A very large number of persons would also see solar development in the SEZ very briefly while driving through Romeo.

As seen from Romeo, solar development in the Los Mogotes East SEZ would appear as a horizontal band of dark or light color (depending on technology type and lighting) with the angular forms of buildings visible projecting above it at the base of the foothills of the mountain ridge backdrop. The thin band of the solar arrays would be partially obscured by shrubs, small

trees, and structures in the foreground of views from Romeo and nearby areas, but where screening was lacking, would likely be obvious to casual observers.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them less visible than the taller, more complex, and more reflective components of parabolic trough facilities. Glare events would likely be observed sometimes because Romeo is east of the SEZ and the PV panels in tracking systems would face generally east at some point in the morning all year long. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, causing very little light pollution, and thus causing minimal night sky impacts.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities. Considering the viewing angle, distance, and screening, parabolic trough facilities in the SEZ would likely cause moderate levels of visual contrast under normal viewing circumstances for viewers on the western side of Romeo, at the Veterans' Memorial, and on US-285.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* The De Tilla Gulch SEZ is too far from Romeo to cause visual impacts. While viewshed analysis shows that a very small portion of the Antonito Southeast SEZ could potentially be visible from the Romeo KOP at a distance of approximately 12 mi, the view would be largely screened by vegetation and structures between Romeo and the Antonito Southeast SEZ, and if solar facilities were visible at all, just the tops of parabolic trough facility structures and associated water vapor plumes within the SEZ might project above the intervening vegetation. While potentially visible, the impacts would be expected to be minimal, and the nature of the facilities would not be discernable to casual observers. As a result, minimal cumulative visual impacts from solar development within Antonito Southeast SEZs are anticipated for viewpoints in or near Romeo. The view of Antonito Southeast SEZ from the Veteran's Memorial would be completely blocked by structures and vegetation in Romeo, thus no cumulative impacts would be expected.

### **3.10.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Los Mogotes East SEZ would be visible from the western edge of Romeo, from the Veterans' Memorial just north of Romeo, and from U.S. 285, and CO-142, both of which pass through Romeo, and are designated as part of the Los Caminos Antiguos Scenic and Historic Byway. Furthermore, the visual contrast rating for the Romeo KOP indicated that solar development in the Los Mogotes East SEZ would create moderate visual contrasts overall, under normal viewing conditions. Higher levels of visual contrast could occur during glare incidents, and because Romeo is east of the SEZ, glare incidents would be expected to

occur sometimes, generally in the morning, especially for persons driving local roads in the vicinity of Romeo. As a result, regional compensatory mitigation is recommended as compensation for potential visual impacts that might occur in the community of Romeo and to the Veterans' Memorial as a result of solar development in the Los Mogotes East SEZ. For more information on impacts to the Los Caminos Antiguos Scenic and Historic Byway, see Section 3.18.

### **3.11 Community of Manassa (Also Representative KOP for Los Caminos Antiguos Scenic and Historic Byway)**

#### **3.11.1 VSA Description**

*VSA Type:* Community

*Potentially Impacting SEZ:* Los Mogotes East SEZ

*Distance from SEZ to Affected Area within VSA:* Approximately 5.1 mi from closest point in the community of Manassa to closest point in the SEZ. Approximately 7 mi from closest point in Manassa to the farthest point in the SEZ. See Figure 3.11-1. The SEZ is within the BLM background zone of 5-15 mi.

*Affected Area within the VSA:* The SEZ is located on an east-facing slope, due west of Manassa. In most parts of Manassa, the SEZ is largely screened by structures or vegetation. Visibility from Manassa is limited to primarily the western edge of the community and residents in these areas would be more likely to see the SEZ on average.

CO-142, which passes through Manassa is designated as part of the Los Caminos Antiguos Scenic and Historic Byway. For persons travelling west on CO-142 or on other local roads, the view of the SEZ is somewhat restricted to the highway right-of-way as there are structures and vegetation on either side of the highway which partially screen the view.

*Estimated Annual Visitation/Usage in VSA:* The population of Manassa is 991 people (US Census 2010). In addition, people passing through Manassa could potentially see the SEZ while driving. CDOT estimates that 620 vehicles pass through Manassa each day on CO-142, some of which may be travelling the Los Caminos Antiguos Scenic and Historic Byway. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 350,750 views, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

The Jack Dempsey Museum is the main tourist attraction in Manassa. Annual visitation is estimated at 1,340 people a year (SdCNHA 2013). Other tourist attractions in the immediate area include Pike's Stockade, McIntyre Springs, and Sego Springs.

*Types of Activities within the Affected Area:* Driving, walking, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that up to 620 vehicles per day pass through Manassa. The population of Manassa is 991 people (US Census 2010). Thus the majority of viewers would be residents and drivers or passengers in vehicles passing through the area. Much of this traffic is likely to be local residents going to and

from work, school, shopping, etc. with a few tourists going to Manassa to visit the Jack Dempsey museum, travelling the Los Caminos Antiguos Scenic and Historic Byway, or on to San Luis to visit a local religious shrine, Fort Garland or the GSDNP.

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* No master plan was found for Manassa. Currently, the affected area of Manassa is in residential use.

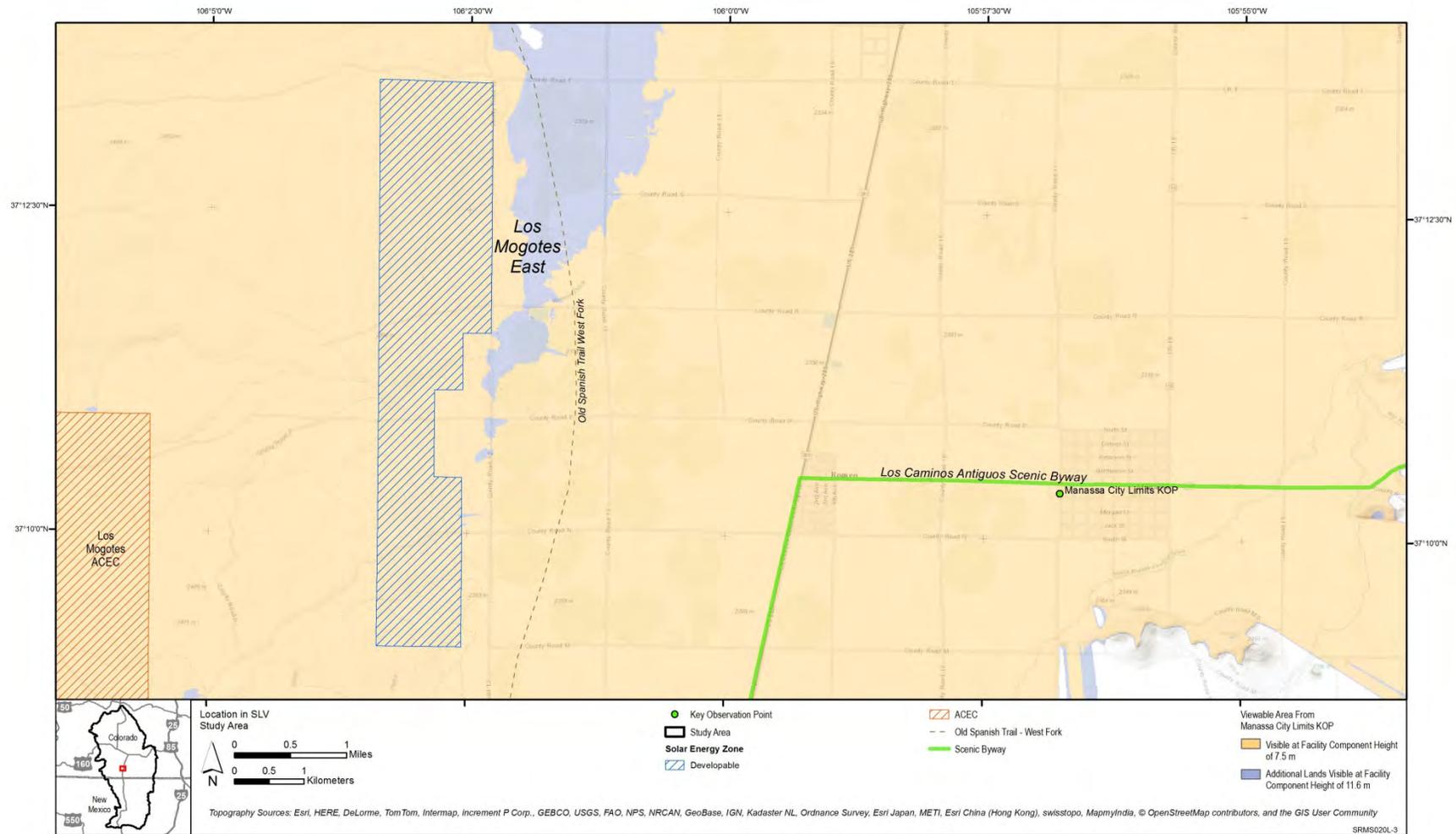


Figure 3.11-1: Viewshed from Manassa KOP, including Los Mogotes East SEZ

### 3.11.2 KOP Description

*KOP Name:* Manassa/Los Caminos Antiguos

*KOP Location:* This KOP is located at the west edge of Manassa, near the intersection of CO-142 and CO-17 (9<sup>th</sup> St.). See Figure 3.11-1.

*Critical or Representative KOP:* Representative.

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* This KOP was chosen as it is a location in Manassa offering a clear view to the west and with a view of the Los Mogotes SEZ. Most of the SEZ is screened from this location. The view of the SEZ in other areas of Manassa is largely screened by structures or vegetation.

This KOP is also representative of the view of the Los Mogotes SEZ from the Los Caminos Antiguos Scenic Byway going west on CO-142 to Romeo. For more information on impacts to the Los Caminos Antiguos Scenic and Historic Byway, see Section 3.18.

*KOP Access Modes:* Automobile, truck, and foot.

### 3.11.3 Visual Context

*General Description:* Looking west towards Los Mogotes SEZ from the western edge of Manassa onto a somewhat cluttered valley floor with agricultural and some grazing land, leading to undulating hills and a low mountain ridge in the background. See Figure 3.11-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, fences, agricultural fields, roads, and utility poles.

*Direction of View toward SEZ:* West, but with most of the SEZ north of due west.

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approx. 50°. Trees, shrubs, and structures provide substantial screening between Manassa and the SEZ. See Figure 3.11-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire SEZ is within the GIS-calculated viewshed of the KOP; however, clumps of trees and shrubs, as well as structures screen much of the view from the KOP to the Los Mogotes SEZ.

*Orientation of the solar energy development within the field of view:* The Los Mogotes East SEZ is partly in the center of the view, but the view of the SEZ is somewhat unbalanced, as the majority of the SEZ is to the right.



**Figure 3.11-2 Photograph of Existing Landscape from Manassa KOP Looking toward Los Mogotes East SEZ**



**Figure 3.11-3 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from Manassa KOP**

### 3.11.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Manassa KOP on Aug. 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.11-1.

**Table 3.11-1 Visual Contrast Rating for Manassa KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√				√			√	
	Line			√				√			√		
	Color			√				√			√		
	Texture				√			√			√		

The overall contrast rating for the Manassa KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

Where there were unobstructed views of the SEZ, the presence of parabolic trough facilities within the SEZ would be likely to result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources.

During glare incidents the degree of contrast could be *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element*

*contrast begins to attract attention and begins to dominate the characteristic landscape.” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.”*

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible between 5 and 7 mi from Manassa. This distance is in the BLM background distance zone; however, it is close enough that the shapes and colors of structures within the SEZ would sometimes be visible. Surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements
- **Angle of Observation.** The SEZ is on a slight slope that rises toward the west, such that the western edge of the SEZ is tilted slightly upward toward the viewer, as seen from Manassa. This would slightly increase visibility of solar facilities within the SEZ; however, the angle of view is still very low, and while in the absence of screening elements solar facilities would be visible as a very narrow band at the foot of a distant, low mountain ridge, foreground vegetation and structures would effectively screen most of the SEZ from view. Because of the distance, the low angle of view, and screening, it is very unlikely that persons not familiar with the nature of the SEZ and its location would recognize it as consisting of solar facilities.
- **Length of Time the Project Is In View.** For residents and visitors to Manassa, views could be extended; for residents, solar developments in the SEZ would be visible on a daily basis, in some cases from resident’s yards, and from some streets in town, though screening would generally make facilities in the SEZ difficult to see. Development within the SEZ could be visible for up to 5 minutes for viewers traveling west from Manassa to Romeo on CO-142 (on the Los Caminos Antiguos Scenic and Historic Byway), and an additional 5 minutes for those travelling west from the eastern edge of the SEZ viewshed, west of Manassa. For persons driving local roads, visibility would be brief, typically under few minutes, depending on route and location. However, views of solar facilities in the SEZ would be sporadic because of screening by vegetation and structures between Manassa and the SEZ.
- **Relative Size or Scale.** Solar facilities within the SEZ would be larger in horizontal extent than most other visible objects in the view. Because of the low viewing angle, the

apparent size of the SEZ would be reduced, but would still spread across a large portion of the view (50°) of the horizontal field of view to the west; however, much of the SEZ would be screened by foreground vegetation and structures, so at best only small and scattered portions of the SEZ would be visible, and their scale would likely be compatible with existing landscape elements.

- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Defoliation of trees in the fall could increase visibility of solar facilities in the SEZ. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.
- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because Manassa is east of the SEZ, glare might be observed from solar facilities in the SEZ, however, the substantial screening by vegetation and structures between Manassa and the SEZ would reduce glare visibility. When glare occurred, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts.

Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night, though views of lighting in the SEZ would generally be screened from view.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view at the foot of a nearby mountain ridge that is prominent in views in the general direction of the SEZ as seen from Manassa. Where visible, the low forms and generally horizontal lines of the solar developments within the SEZ would

repeat the strong horizontal lines and low forms of the existing landscape. The blocky forms of structures within the solar facilities could be visible above the solar arrays, and could contrast with the softer and less rectilinear lines of the existing landscape; however, there are a number of structures between Manassa and the SEZ, and the forms of solar facilities in the SEZ would likely blend in well with these existing structures in terms of form, line, and color.

- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but because of the relatively short distance between Manassa and the SEZ, would not strongly affect visibility on most days.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.11.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Manassa is a small community in a rural area with substantial views of agricultural and natural-appearing landscapes. Residents of Manassa could potentially see industrial development in the SEZ anytime they look to the west from the western portions of their community, and when driving through the local area; however, views of all or some of the SEZ would be screened by vegetation and structures for most locations within Manassa. Most of the vehicular traffic is likely to be local residents going to and from work with a few tourists passing through Manassa on their way to the Jack Dempsey Museum or to San Luis to visit a religious shrine. Industrial development is inconsistent with the rural visual character of the surrounding landscape. Some residents might find even the slightest view of industrial-scale solar facilities unattractive and inappropriate and may be sensitive to a change in the natural and rural appearing landscape, especially if they are frequent visitors.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be visible to persons on the western edge of Manassa with unobstructed views looking directly at the SEZ; however, views of all or some of the SEZ would be screened by vegetation and structures for most locations within Manassa. If parabolic trough facilities were located in the SEZ, the height of the reflector array, various buildings and other structures, presence of plumes under some conditions, and likelihood of glare incidents would attract visual attention, and make them unlikely to be missed by a casual observer.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* The residents of Manassa would be considered to be sensitive viewers; persons driving through Manassa on average would be less sensitive, but would vary from low to

high sensitivity. Solar development within the SEZ would be visible to some residents on a daily basis and potentially for extended viewing periods. The other residents might view solar development in the SEZs briefly while driving to and from their homes, but generally would not be expected to notice it unless glare was visible. A large number of persons would also see solar development in the SEZ very briefly while driving local roads near Manassa.

As seen from Manassa or on the Los Caminos Antiguos Scenic and Historic Byway near Manassa, solar development in the Los Mogotes East SEZ would appear as a horizontal band of dark or light color (depending on technology type and lighting) with the angular forms of buildings visible projecting above it at the base of the foothills of the mountain ridge backdrop. The thin band of the solar arrays would be partially or wholly obscured by shrubs, small trees, and structures in the foreground of views from Manassa and nearby areas, but where screening was lacking, would be unlikely to be obvious to casual observers, unless glare was visible.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them less visible than the taller, more complex, and more reflective components of parabolic trough facilities. Glare events would likely be observed sometimes because Manassa is east of the SEZ and the PV panels in tracking systems would face generally east at some points in the morning all year long, but the occurrence of glare would be reduced by the screening elements. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, causing very little light pollution, and thus causing minimal night sky impacts.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them more visible than PV facilities. Nonetheless, considering the very low viewing angle and screening present, parabolic trough facilities in the SEZ would still likely cause weak levels of visual contrast under normal viewing circumstances for viewers on the western side of Manassa or on the Los Caminos Antiguos Scenic and Historic Byway near Manassa.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* The De Tilla Gulch SEZ is too far from Manassa to cause visual impacts. While viewshed analysis shows that a small portion of the Antonito Southeast SEZ could potentially be visible from the Manassa KOP at a distance of approximately 9.1 to 12.2 mi, the view would be largely screened by vegetation and structures between Manassa and the Antonito Southeast SEZ, and if solar facilities were visible at all, just the tops of structures within the SEZ might project above the intervening vegetation. While potentially visible, the impacts would be expected to be minor, and the nature of the facilities would not likely be discernable to casual observers. As a result, minimal to minor cumulative visual impacts from solar development within Antonito Southeast SEZs are anticipated for viewpoints in or near Manassa.

### **3.11.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Los Mogotes East SEZ would be visible from the western edge of Manassa, and CO-142 which passes through Manassa, and is designated as part of the Los Caminos Antiguos Scenic and Historic Byway. The visual contrast rating for the Manassa KOP indicated that solar development in the Los Mogotes East SEZ is largely screened from view by vegetation and structures between Manassa and the Los Mogotes East SEZ, and would create weak visual contrasts overall, under normal viewing conditions. Higher levels of visual contrast could occur during glare incidents, and because Manassa is east of the SEZ, glare incidents would be expected to occur sometimes, generally in the morning, especially for persons driving local roads in the vicinity of Manassa. However, the screening would reduce visibility and duration of glare events substantially. Therefore, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur in the community of Manassa and the Los Caminos Antiguos Scenic and Historic Byway in the vicinity of Manassa associated with solar development in the Los Mogotes East SEZ, or for the minor cumulative visual impacts from solar development in the Antonito Southeast SEZ. For more information on impacts to the Los Caminos Antiguos Scenic and Historic Byway, see Section 3.18.

### **3.12 San Luis Hills ACEC (Representative KOPs: Flat Top Highpoint, Piñon Hills Highpoint, John James Canyon Trailhead)**

#### **3.12.1 VSA Description**

*VSA Type:* Specially Designated Area

*Potentially Impacting SEZs:* Los Mogotes East SEZ, Antonito Southeast SEZ

*Representative KOPs:* Flat Top Highpoint, Piñon Hills Highpoint, John James Canyon Trailhead

*Distance from SEZ to Affected Area within VSA:* The distance from the closest point in the San Luis Hills ACEC to the closest visible point in the Los Mogotes SEZ is approximately 9.5 mi. The distance from the closest point in the San Luis Hills ACEC to the farthest visible point in the Los Mogotes SEZ is approximately 10.9 mi. See Figure 3.12-1.

The distance from the closest point in the San Luis Hills ACEC to the closest visible point in the Antonito Southeast SEZ is approximately 4.9 mi. The distance from the closest point in the San Luis Hills ACEC to the farthest visible point in the Antonito Southeast SEZ is approximately 10.5 mi. See Figure 3.12-2.

*Affected Area within the VSA:* The total area of the San Luis Hills ACEC is 36,455 acres. The Los Mogotes East SEZ is located on an east-facing slope, west of the San Luis Hills ACEC. Solar facilities within the Los Mogotes East SEZ would be visible from 12,700 acres, or 35% of the ACEC. See Figure 3.12-1.

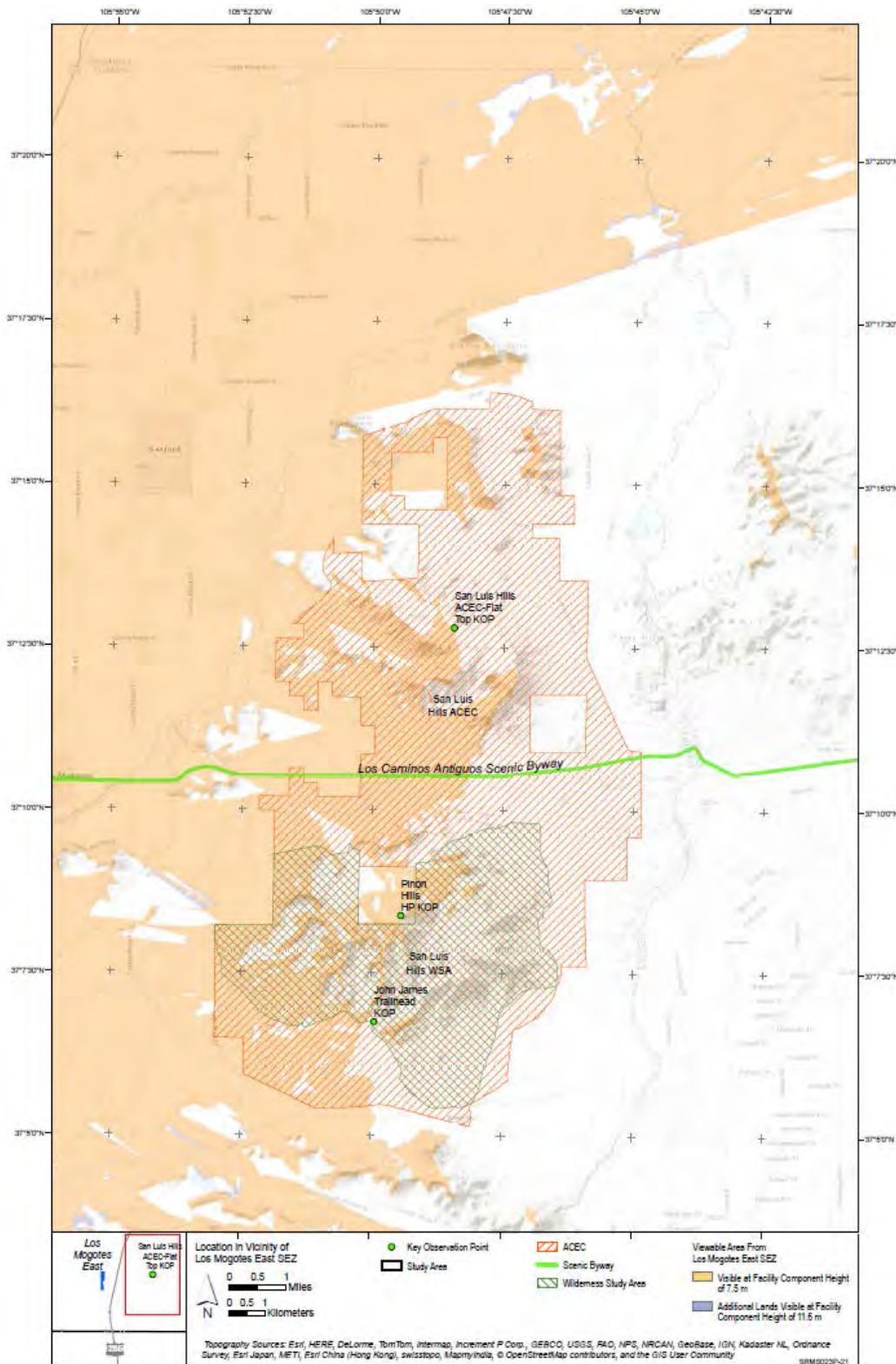
The Antonito Southeast SEZ is located on a flat plain southwest of the San Luis Hills ACEC. Photovoltaic facilities within the Antonito Southeast SEZ would be visible from 11,314 acres, or 31% of the ACEC. Parabolic trough facilities in the SEZ would be visible from an additional 734 acres, or 33% of the ACEC. See Figure 3.12-2.

*Estimated Annual Visitation/Usage in VSA:* Visitor estimates are not available; however, BLM describes the ACEC as being “rarely visited” (Brown 2015a), and visitation/usage is assumed to be very low.

*Types of Activities within the Affected Area:* Activities in the ACEC include riding horses, hiking, sightseeing, photography, hunting, wildlife watching, rock climbing and rock hounding (Brown 2015a).

*Estimated proportion of visitors conducting each major activity type:* The majority of visitors to the San Luis Hills ACEC are participating in the relaxation and recreation activities listed above. Percentages of visitor use are not available; however, BLM identifies hunting and hiking as likely to be the most common activities (Brown 2015a).

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* The San Luis Hills ACEC was designated in part for its scenic values and opportunities for solitude. (BLM 2012). BLM has stated that visitors to the ACEC may be seeking wilderness experiences and thus could be sensitive to views of industrial development (Brown 2015a). The area is not heavily promoted by BLM (Brown 2015a).



**Figure 3.12-1 Viewshed of the Los Mogotes East SEZ, including the Flat Top Highpoint, Piñon Hills Highpoint, John James Canyon Trailhead KOPs.**

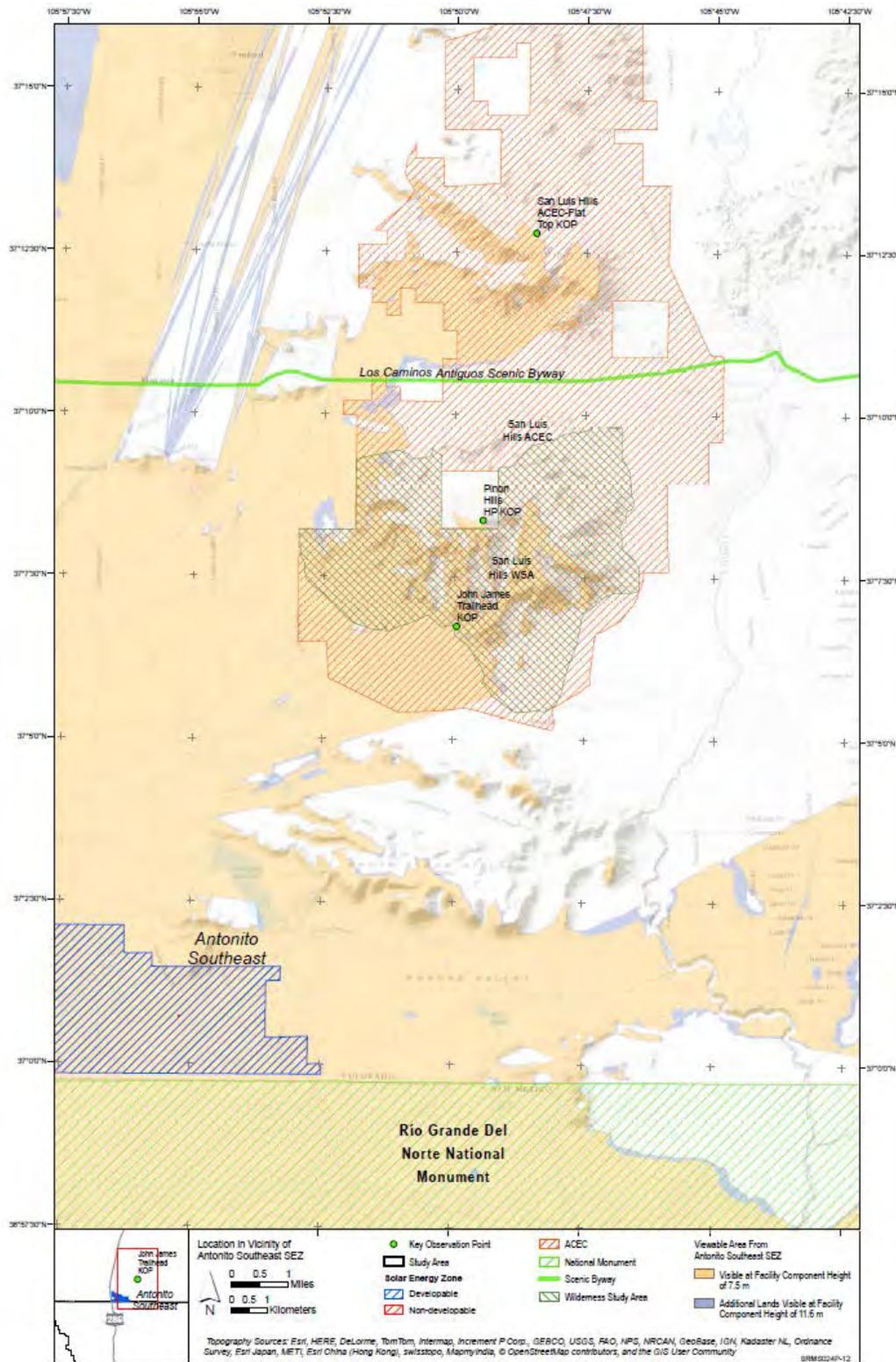


Figure 3.12-2 Viewshed of the Antonito Southeast SEZ, including the Flat Top Highpoint, Piñon Hills Highpoint, John James Canyon Trailhead KOPs.

### 3.12.2 KOP Description – Flat Top

*KOP Name:* Flat Top

*Potentially Impacting SEZs:* Los Mogotes East SEZ, Antonito Southeast SEZ

*KOP Location:* The Flat Top KOP is located near the highpoint of Flat Top Mesa within the San Luis Hills ACEC, near a large rock cairn. The distance from the KOP to the nearest point in the Los Mogotes East SEZ is approximately 12.7 mi. The distance from the KOP to the farthest point in the Los Mogotes East SEZ is approximately 14.3 mi. The distance from the KOP to the nearest point in the Antonito Southeast SEZ is approximately 14.2 mi. The distance from the KOP to the farthest point in the Antonito Southeast SEZ is approximately 18.3 mi. See Figure 3.12-3.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The Flat Top KOP is representative of locations on the Flat Top Mesa in the northern portion of the ACEC.

*KOP Access Modes:* High clearance vehicle to the base of the mesa, then a steep and difficult hike to the top of the mesa.

### 3.12.3 Visual Context

*General Description:* Looking across Flat Top Mesa towards San Luis Valley and the southern half of the San Luis Hills ACEC, with the peak of San Antonio Mountain in the background to the south, and a low mountain ridge and mesas beyond to the west. See Figure 3.12-4.

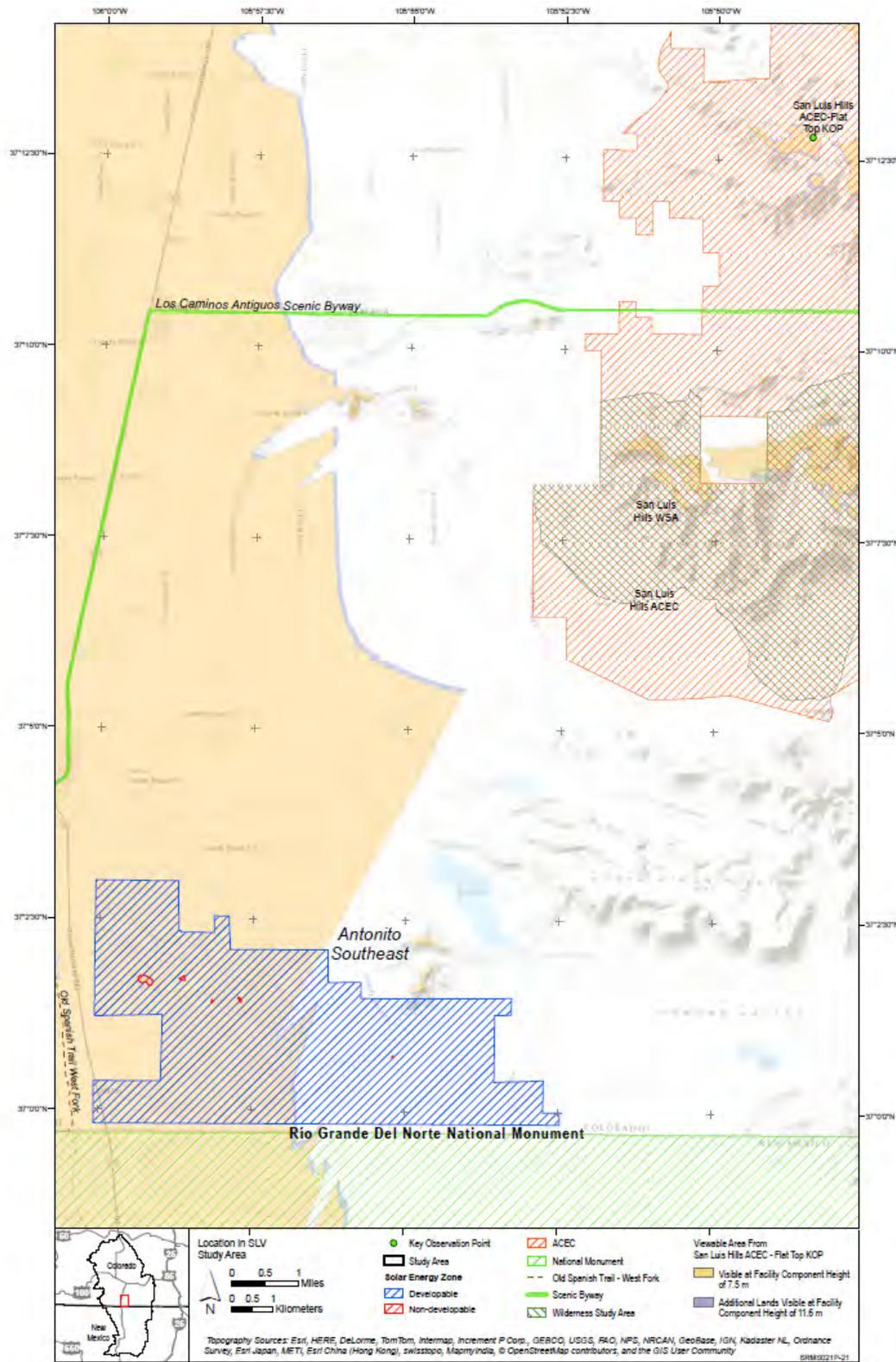
*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, agricultural fields, grazing land, and roads.

*Direction of View toward SEZ:* West (Los Mogotes East SEZ), Southwest (Antonito Southeast SEZ)

*Horizontal Field of View (in degrees) Potentially Occupied by Solar Energy Development within the SEZ:* Approximately 23° (Los Mogotes East SEZ). Approximately 15° (Antonito Southeast SEZ). See Figures 3.12-5 and 3.12-6.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire Los Mogotes East SEZ is within the GIS-calculated viewshed of the KOP. The KOP viewshed includes 5,578 acres or 57% of the Antonito Southeast SEZ.

*Orientation of the Solar Energy Development within the Field of View:* The Los Mogotes East SEZ is to the right of the center of the view. The Antonito Southeast SEZ is near the center of the view.



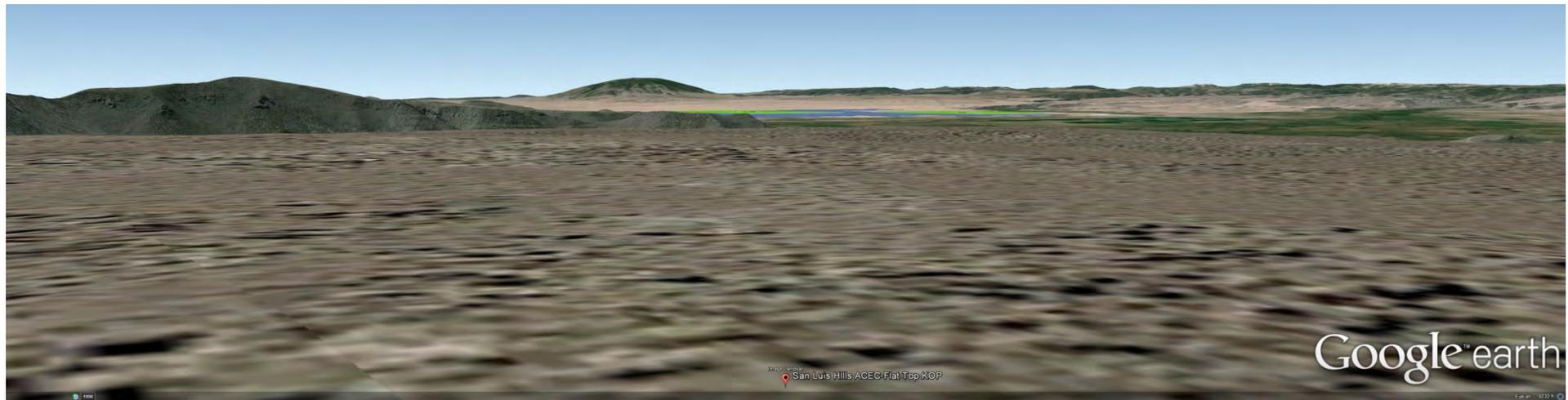
**Figure 3.12-3 Viewshed of Flat Top KOP with Antonito Southeast SEZ. The Entire Los Mogotes East SEZ is within the KOP Viewshed.**



**Figure 3.12-4 Photograph of Existing Landscape from Flat Top KOP Looking toward Los Mogotes East SEZ (right center) and Antonito Southeast SEZ (left center)**



**Figure 3.12-5 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from Flat Top KOP**



**Figure 3.12-6 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from Flat Top KOP**

### 3.12.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Flat Top KOP on October 7, 2014, using Google Earth visualization of the SEZs and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZs. The scanned contrast rating form is available in Appendix A. The contrast rating is presented in Table 3.12-1. The contrast rating included the view of both SEZs, considered together.

**Table 3.12-1 Visual Contrast Rating for Flat Top KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√				√				√
	Line				√				√				√
	Color				√	√				√			
	Texture				√				√				√

The overall contrast rating for the Flat Top KOP is *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible between 12.7 mi and 14.3 mi from the Flat Top KOP. This distance is within the BLM background distance zone. Solar collector/reflector arrays could potentially be seen as blocks of color, but because of the distance individual facilities would appear small in size, and would lack surface details. Solar development within the Antonito Southeast SEZ would be visible between 14.2 mi and 18.3 mi from the Flat Top KOP. This distance is primarily within the BLM Seldom Seen zone. At these longer distances, solar collector/reflector arrays could potentially be seen as blocks of color, but would lack surface details, i.e., individual panels/mirrors would not be discernable. Depending on atmospheric conditions, facilities at the longest distances might be difficult to see at all. At the longest distances, it is likely that persons not familiar with the nature of the SEZ and its location would not recognize it as consisting of solar facilities.
- **Angle of Observation.** The SEZs are on the relatively flat valley floor, and the Flat Top KOP is significantly elevated with respect to the SEZs, so that viewers at the KOP would be looking down onto solar facilities in both SEZs. The full extent of the Los Mogotes East SEZ and a large portion of the much larger Antonito Southeast SEZ would be visible. The high-angle view would make the rectilinear geometry of the structures and various facilities within the SEZs more apparent. In addition, clearing of vegetation for the facilities and roads would be apparent, and the clearing and color of the collector/reflector arrays would contrast strongly with the existing vegetation under most viewing conditions.
- **Length of Time the Project Is In View.** The length of visibility would depend on the activity of the user, however, it is likely that ACEC visitors who made the strenuous hike to the top of the mesa would spend several minutes, if not substantially longer, enjoying the panoramic view of the San Luis Valley. Hunters might look around only briefly, while hikers, photographers, and those seeking solitude would likely have relatively long-duration views.
- **Relative Size or Scale.** The two SEZs cover a substantial portion of the horizontal field of view (23° and 15°, respectively). Because of the relatively high viewing angle, the large areas that are included in the SEZs would be apparent. The facilities within the SEZs, viewed collectively, would be far larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, the color of solar facilities within the SEZ would contrast strongly with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be stronger when snow is on the ground, particularly for PV facilities, which have black panels, but it is unlikely that there would be visitors to the KOP area in winter. In certain conditions when air temperatures are low,

the visibility of water vapor plumes from cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the Flat Top KOP is east of the Los Mogotes SEZ, glare would likely be observed in the mornings at various times of the year, associated with tracking PV facilities and/or parabolic trough facilities. During glare incidents the degree of contrast could increase substantially. Because the KOP is north of the Antonito Southeast SEZ, glare from facilities in that SEZ is unlikely.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. At a distance of 12-18 mi, facility lighting would be noticeable, and because the area of the Antonito Southeast SEZ is currently unlit, there could be a substantial increase in lighting visible at night in that direction, especially from parabolic trough facilities within the SEZ. The lights would not likely be substantially brighter than existing lights visible in some areas near the SEZs, but would likely blend in with existing lights visible in areas near the SEZs.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZ would be observed from a relatively high vertical angle of view on the valley floor. The low forms and generally horizontal lines of the solar developments within the SEZ would be somewhat compatible with the horizontal lines of roads and field edges and low forms of buildings in the existing landscape.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ. Because of the moderately long distance between the Flat Top KOP and the SEZ, atmospheric haze could sometimes be a significant factor in obscuring visibility of facilities within the SEZ, and would likely reduce visibility of facilities in the farther portion of the Antonito Southeast SEZ under normal viewing conditions.

- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.12.5 KOP Description – Piñon Hills Highpoint

*KOP Name:* Piñon Hills Highpoint

*Potentially Impacting SEZs:* Los Mogotes East SEZ, Antonito Southeast SEZ

*KOP Location:* As its name suggests, the Piñon Hills Highpoint KOP is located at the highpoint of Piñon Hills. The highpoint is actually outside the ACEC by approximately a tenth of a mile, but the view from et highpoint is similar to other views in the general area within the ACEC. The distance from the KOP to the nearest point in the Los Mogotes SEZ is approximately 12.1 mi. The distance from the KOP to the farthest point in the Los Mogotes SEZ is approximately 14.1 mi. See Figure 3.12-7. The distance from the KOP to the nearest point in the Antonito Southeast SEZ is approximately 8.6 mi. The distance from the KOP to the farthest point in the Antonito Southeast SEZ is approximately 13.8 mi. See Figure 3.12-7.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The Piñon Hills Highpoint KOP view is representative of views from high elevation locations in the southern portion of the ACEC.

*KOP Access Modes:* High clearance vehicle to the base of the Piñon Hills, then a moderately steep hike on the John James Trail, and eventually to the KOP. Could also be ridden on horseback, and possibly mountain bikes.

### 3.12.6 Visual Context

*General Description:* Looking across the Piñon Hills towards San Luis Valley and the southern half of the San Luis Hills ACEC, with the peak of San Antonio Mountain in the background to south, and a low mountain ridge and mesas beyond to the west. Flat Top Mesa is prominent in the view to the north, which is spectacular, and commands visual attention. See Figure 3.12-8.

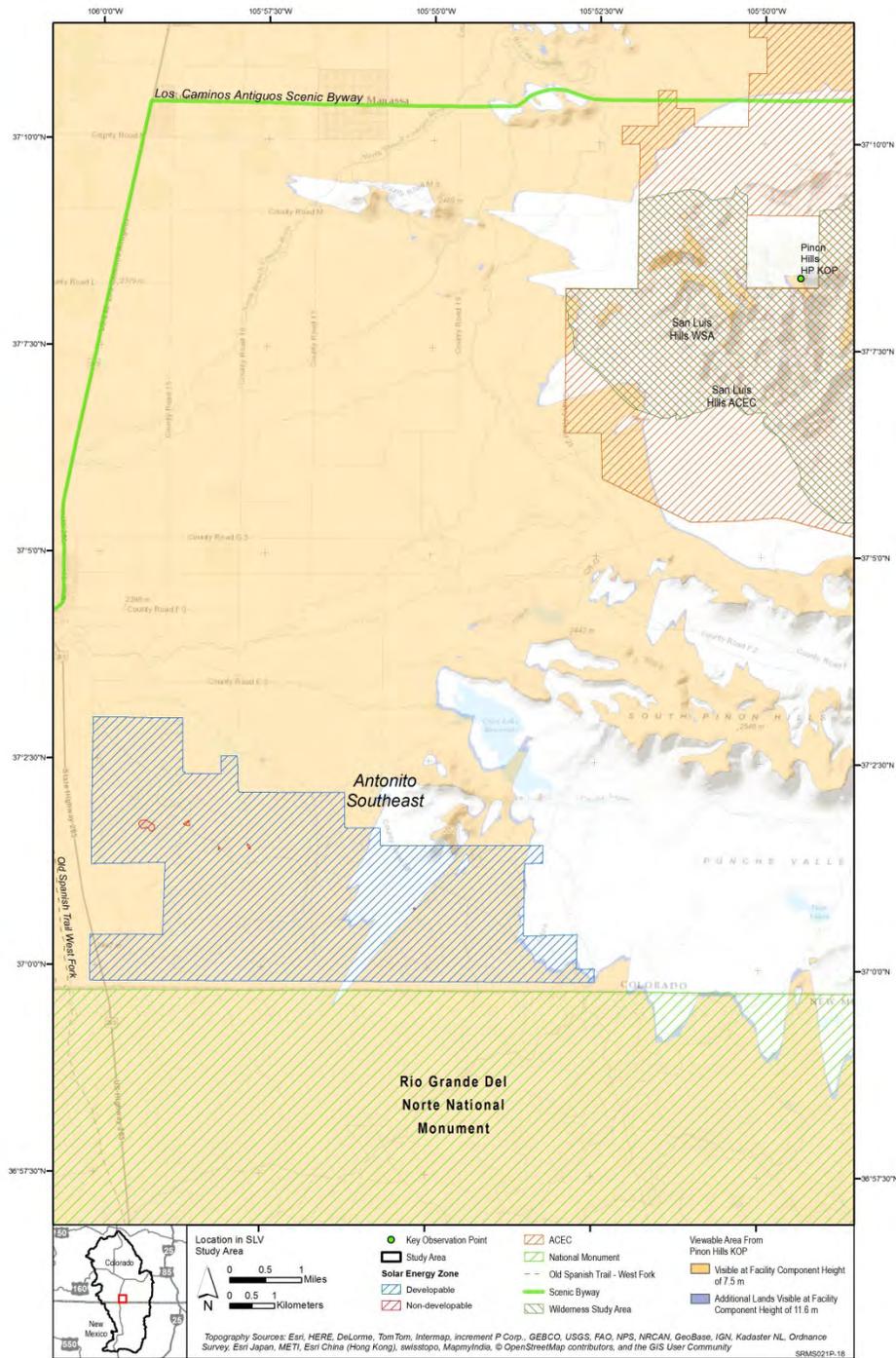
*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, agricultural fields, grazing land, and roads.

*Direction of View toward SEZ:* West (Los Mogotes East SEZ), Southwest (Antonito Southeast SEZ)

*Horizontal Field of View (in degrees) Potentially Occupied by Solar Energy Development within the SEZ:* Approximately 23° (Los Mogotes East SEZ). Approximately 42° (Antonito Southeast SEZ). See Figures 3.12-9 and 3.12-10.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire Los Mogotes East SEZ is within the GIS-calculated viewshed of the KOP. The KOP viewshed includes 8,594 ac, or 88% of the Antonito Southeast SEZ.

*Orientation of the Solar Energy Development within the Field of View:* The Antonito Southeast SEZ is at the far left of the view. The Los Mogotes East SEZ is in the center of the view.



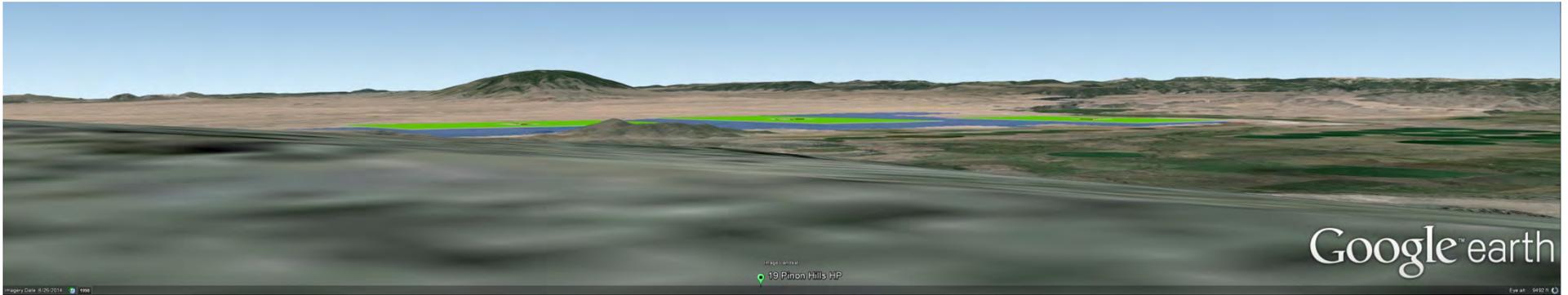
**Figure 3.12-7 Viewshed of Piñon Hills Highpoint KOP with Antonito Southeast SEZ. The Entire Los Mogotes East SEZ is within the KOP Viewshed.**



**Figure 3.12-8 Photograph of Existing Landscape from Piñon Hills Highpoint KOP Looking toward Los Mogotes East SEZ (right center) and Antonito Southeast SEZ (left center)**



**Figure 3.12-9 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from Piñon Hills Highpoint KOP**



**Figure 3.12-10 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from Piñon Hills Highpoint KOP**

**3.12.7 Visual Contrast Rating**

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Piñon Hills Highpoint on August 15, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned contrast rating form is available in Appendix A. The contrast rating is presented in Table 3.12-1.

**Table 3.12-1 Visual Contrast Rating for Piñon Hills Highpoint KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√		√					√	
	Line				√		√					√	
	Color				√		√			√			
	Texture				√			√				√	

In part because of the large areas of solar development that would be visible, the overall contrast rating for the Piñon Hills Highpoint KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast demands attention, will not be overlooked, and is dominant in the landscape.*” This corresponds most closely to the VRM Class IV objective. The VRM Class IV objective from Manual 8431 is “*...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible between 12.1 mi and 14.1 mi from the Piñon Hills Highpoint KOP. Solar development within the Antonito Southeast SEZ would be visible between 8.6 mi and 14.8 mi from the Piñon Hills Highpoint KOP. This distance is within the BLM background distance zone. Solar collector/reflector arrays could potentially be seen as blocks of color, but because of the distance individual facilities would appear small in size, and would lack surface details.
- **Angle of Observation.** The SEZs are on the relatively flat valley floor, and the Piñon Hills Highpoint KOP is significantly elevated with respect to the SEZs, so that viewers at the KOP would be looking down onto solar facilities in both SEZs. The full extent of the Los Mogotes East SEZ and the vast majority of the much larger Antonito Southeast SEZ would be visible. The high-angle view would make the rectilinear geometry of the structures and various facilities within the SEZs more apparent. In addition, clearing of vegetation for the facilities and roads would be apparent, and the clearing and color of the collector/reflector arrays would contrast noticeably with the existing vegetation under most viewing conditions.
- **Length of Time the Project Is In View.** The length of visibility would depend on the activity of the user, however, it is likely that ACEC visitors who made the moderately strenuous hike to the Piñon Hills Highpoint KOP would spend several minutes, if not substantially longer, enjoying the panoramic views of the San Luis Valley. Hunters might look around only briefly, while hikers, photographers, and those seeking solitude would likely have relatively long-duration views.
- **Relative Size or Scale.** The two SEZs cover a large portion of the horizontal field of view (23° and 42°, respectively). Because of the relatively high viewing angle, the large areas that are included in the SEZs would be apparent. The facilities within the SEZs, viewed collectively, would be far larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, the color of solar facilities within the two SEZs would contrast noticeably with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be stronger when snow is on the ground, particularly for PV facilities, which have black panels, but it is unlikely that there would be visitors to the KOP area in winter. In certain conditions when air temperatures are low, the visibility of water vapor plumes from cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.
- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare

that may be visible for very long distances. Because the Piñon Hills Highpoint KOP is east of the Los Mogotes SEZ, glare would likely be observed in the mornings at various times of the year, associated with tracking PV facilities and/or parabolic trough facilities. During glare incidents the degree of contrast could increase substantially. Because the KOP is northeast of the Antonito Southeast SEZ, glare from facilities in that SEZ is less likely.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. At a distance of 12-14 mi, facility lighting would be noticeable, and because the area of the Antonito Southeast SEZ is currently unlit, there could be a substantial increase in lighting visible at night in that direction, especially from parabolic trough facilities within the SEZ. The lights would not likely be substantially brighter than existing lights visible in some areas near the SEZs.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZs would be observed from a relatively high vertical angle of view on the valley floor. The low forms and generally horizontal lines of the solar developments within the SEZs would be somewhat compatible with the horizontal lines of roads and field edges and low forms of buildings in the existing landscape. The Antonito Southeast SEZ is located directly between the Piñon Hills Highpoint KOP and San Antonio Mountain, and San Antonio Mountain is prominent in the view, and draws visual attention. This in turn would focus viewer attention on solar facilities in the SEZ, particularly if lighting condition created strong color contrasts between the collector/reflector arrays and the surrounding vegetation.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZs. Because of the moderately long distance between the Piñon Hills Highpoint KOP and the SEZs, atmospheric haze could sometimes be a significant factor in obscuring visibility of facilities within the SEZs.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.12.8 KOP Description – John James Canyon Trailhead

*KOP Name:* John James Canyon Trailhead

*Potentially Impacting SEZs:* Antonito Southeast SEZ

*KOP Location:* The John James Canyon Trailhead KOP is located near the mouth of John James Canyon within the San Luis Hills ACEC and WSA. The distance from the KOP to the nearest point in the Antonito Southeast SEZ is approximately 6.8 mi. The distance from the KOP to the farthest point in the Antonito Southeast SEZ is approximately 12.3 mi. See Figure 3.12-11.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The John James Canyon Trailhead KOP is representative of lower elevation views from the southern portion of the ACEC, and is on a trail commonly used to access the ACEC.

*KOP Access Modes:* High clearance vehicle to near the trailhead, then a short hike to the KOP. Could also be done on horseback, ATV, or mountain bike.

### **3.12.9 Visual Context**

*General Description:* Looking southwest down a shallow slope to low hills and ridges with the peak of San Antonio Mountain in the background to the south, with the San Luis Valley floor and the western portion of the SEZ to the southwest and west. Visible vegetation is almost all short grasses. See Figure 3.12-12.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, agricultural fields, roads, farm buildings, small town development and grazing land; however, these are distant, and the majority of the viewed landscape is currently natural appearing.

*Direction of View toward SEZ:* Southwest

*Horizontal Field of View (in degrees) Potentially Occupied by Solar Energy Development within the SEZ:* Approximately 22°. See Figure 3.12-13.

*Acreage and Percentage of SEZ within KOP Viewshed:* The KOP viewshed includes 4,919 ac or 51% of the Antonito Southeast SEZ.

*Orientation of the Solar Energy Development within the Field of View:* The view is centered on San Antonio Mountain. Antonito Southeast SEZ is to the right of the center of the view.

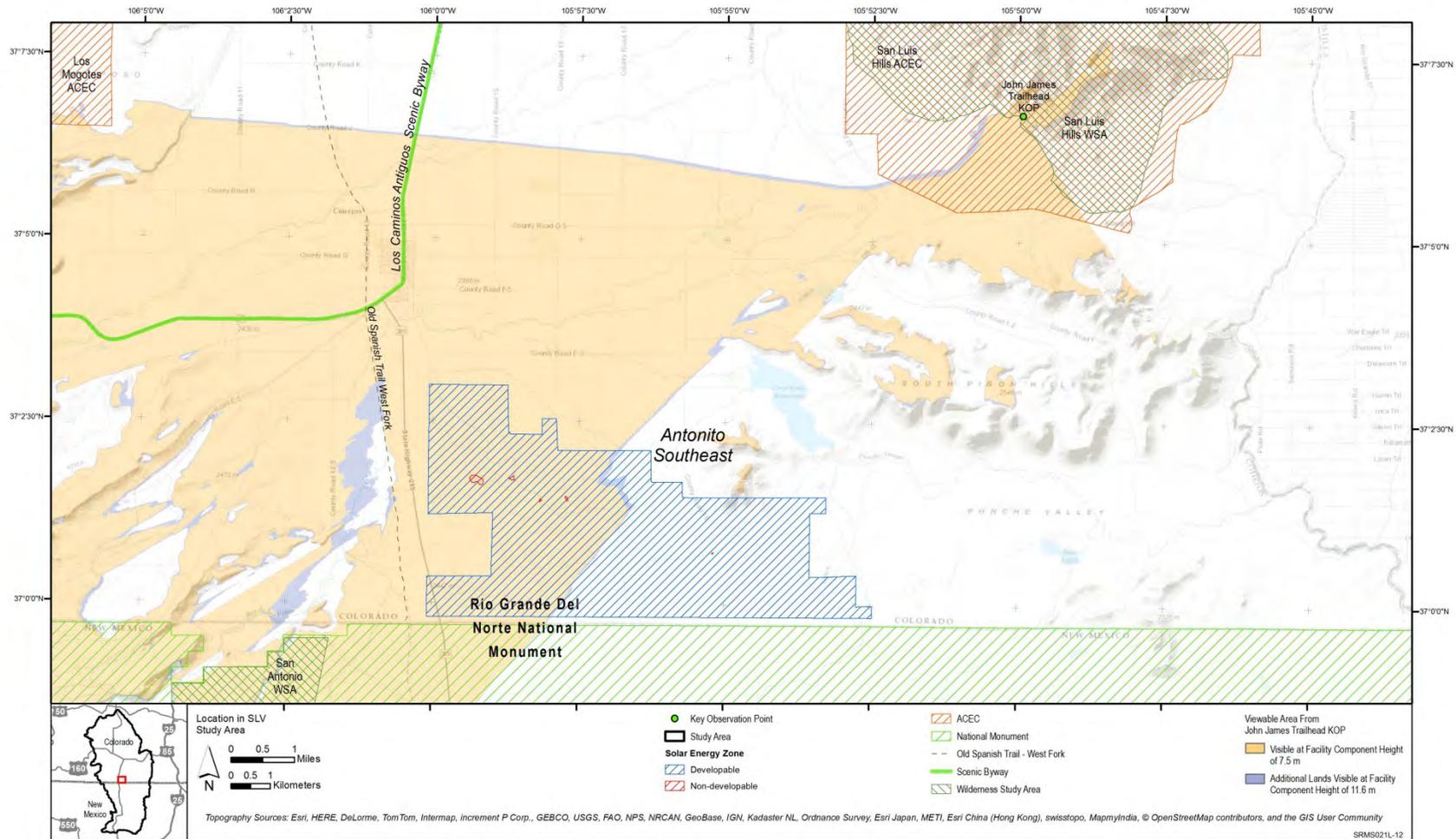


Figure 3.12-11 Viewshed of John James Canyon Trailhead KOP with Antonito Southeast SEZ



**Figure 3.12-12 Photograph of Existing Landscape from John James Canyon Trailhead KOP Looking toward Antonito Southeast SEZ (right center)**



**Figure 3.12-13 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from John James Canyon Trailhead KOP**

**3.12.10 Visual Contrast Rating**

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the John James Canyon Trailhead KOP on October 7, 2014, using Google Earth visualization of the SEZs and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZs. The scanned contrast rating form is available in Appendix A. The contrast rating is presented in Table 3.12-1. The contrast rating included the view of both SEZs, considered together.

**Table 3.12-1 Visual Contrast Rating for John James Canyon Trailhead KOP**

DEGREE OF CONTRAST		FEATURES												
		LAND/WATER BODY				VEGETATION				STRUCTURES				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
ELEMENTS	Form				√			√					√	
	Line				√			√					√	
	Color				√		√				√			
	Texture				√			√					√	

The overall contrast rating for the John James Canyon Trailhead KOP is *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible between 6.8 mi and 12.3 mi from the John James Canyon Trailhead KOP. This distance is within the BLM background distance zone. Solar collector/reflector arrays could potentially be seen as blocks of color, but because of the distance individual facilities would appear small in size, and would lack most surface details.
- **Angle of Observation.** The SEZ is on the relatively flat valley floor, and the John James Canyon Trailhead KOP is only slightly elevated with respect to the SEZs. As a result, the angle of view is low, and solar facilities within the SEZ would be visible as a narrow band across the valley floor. Because of the distance and low angle of view, though facilities within the SEZ would often be plainly visible, it is possible that persons not familiar with the nature of the SEZ would not recognize that it contains solar facilities.
- **Length of Time the Project Is In View.** The length of visibility would depend on the activity of the user, however, persons entering the canyon would be looking away from the SEZ, and would not see it at all unless they turned around to look at the valley. In this case, views might be brief, and there are no views of the SEZ from the interior of the canyon. For persons leaving the canyon, the SEZ would be in view as they approached and passed the KOP, and views might last several minutes in that case.
- **Relative Size or Scale.** The SEZ covers a substantial portion of the horizontal field of view (22°). Because of the relatively low viewing angle, the solar collector arrays would form a thick band of light or dark color across the valley floor. The facilities within the SEZs, viewed collectively, would be larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, the color of solar facilities within the SEZ would contrast noticeably with the existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be stronger when snow is on the ground, particularly for PV facilities, which have black panels, but there would be very few visitors to the KOP area in winter. In certain conditions when air temperatures are low, the visibility of water vapor plumes from cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.
- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the John James Canyon Trailhead KOP is east northeast of the Los Mogotes SEZ, there might sometimes be glare visible

from solar facilities within the SEZ. The occurrence of glare could increase contrast substantially, strongly drawing visual attention to the SEZ.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. At a distance of 6-12 mi, facility lighting would be noticeable, and because the area of the SEZ is currently unlit, there could be a substantial increase in lighting visible at night, especially from parabolic trough facilities within the SEZ.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZ would be observed from a low vertical angle of view on the valley floor. The low forms and generally horizontal lines of the solar developments within the SEZ would be somewhat compatible with the horizontal lines of roads and field edges and low forms of buildings in the existing landscape. San Antonio Mountain and the South Piñon Hills are prominent to the left of the SEZ, and draw visual attention away from the SEZ somewhat.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ. Because of the moderately long distance between the John James Canyon Trailhead KOP and the SEZ, atmospheric haze could sometimes reduce visibility of facilities within the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.12.11 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The San Luis Hills ACEC was designated in part for its scenic values and opportunities for solitude. (BLM 2012). BLM has stated that visitors to the ACEC may be seeking wilderness experiences and thus could be sensitive to views of industrial development (Brown 2015a). Industrial development is inconsistent with the natural and rural visual character of the surrounding landscape. Some ACEC visitors might find the view of industrial-scale solar facilities in the Los Mogotes East and Antonito Southeast SEZs unattractive.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the Los Mogotes East and Antonito Southeast SEZs could not be missed by

casual observers. Under normal viewing conditions, it would be noticeable to casual observers, and where both SEZs are visible, could begin to dominate the view. If glare events occurred, contrast levels could be high enough that solar facilities in the SEZs would attract and hold visual attention, and have sufficient contrast and apparent size to dominate the view.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Solar facilities in one or both of the SEZs would be plainly visible to visitors in about half of the ACEC, mostly the western portions. Most users of the ACEC would be considered to be sensitive viewers; however, visitation is thought to be very low (Brown 2015a), estimated at less than 12 visits/year. There is a variety of other development visible within the San Luis Valley, and some visual characteristics of solar facilities would be compatible with other development in the valley; however, the high reflectivity of the collector/reflector arrays and very large size of the facilities and the SEZs as a whole would make them visually prominent.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them generally less noticeable than parabolic trough facilities, but because of the size of the SEZs, they would still be noticeable as large blocks of dark or light color of an unnatural evenness, and likely with obviously artificial geometry. When glare events occurred and caused bright reflections strong visual contrast would sometimes be observed; however, glare events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they could add very little light pollution, but would still be visible.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Solar facilities in both the Los Mogotes East and Antonito Southeast SEZs would be visible from a substantial portion of the ACEC, and in many locations, most or all of one or both SEZs would be visible, and thus the cumulative impacts from simultaneous viewing of both SEZs would be large. In other locations, as ACEC visitors moved, facilities in first one, then the other SEZ would be visible, so there would also be cumulative impacts from sequential viewing of the SEZs.

### **3.12.12 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Los Mogotes East and Antonito Southeast SEZs would be noticeable to casual observers in large portions of the San Luis Hills ACEC, and could cause moderate to strong visual contrasts depending on the location within the ACEC. At least some viewers would be considered sensitive to industrial development, but a variety of cultural modifications are seen throughout the San Luis Valley, so the existing views are generally not natural-appearing. Cumulative visual impacts from simultaneous and sequential viewing of solar facilities within the SEZs would be large. These factors would generally suggest regional compensatory mitigation is warranted; however, the current estimated visitation to the ACEC is so low that the total visual impact cannot be considered significant. In addition, view duration is generally not likely to be long, except for a very few individuals. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the San Luis Hills ACEC as a result of solar development in the Los Mogotes East and Antonito Southeast SEZs.

### 3.13 Los Mogotes Peaks

#### 3.13.1 VSA Description

*VSA Type:* Area of Tribal Importance

*Potentially Impacting SEZs:* Los Mogotes East, Antonito Southeast

*Distance from SEZs to Affected Area within VSA:* Note: The Los Mogotes peaks area is an area of tribal importance with an indefinite boundary. All distances provided are measured from the KOP used for the analysis, which is the southernmost of the three Los Mogotes peaks. The distance from the Los Mogotes Peak KOP to the closest visible point in the Los Mogotes SEZ is approximately 8.4 mi. The distance from the Los Mogotes Peak KOP to the farthest visible point in the Los Mogotes SEZ is approximately 12.8 mi. See Figure 3.13-1.

The distance from the Los Mogotes Peak KOP to the closest visible point in the Antonito Southeast SEZ is approximately 9.5 mi. The distance from the Los Mogotes Peak KOP to the farthest visible point in the Antonito Southeast SEZ is approximately 17.2 mi. See Figure 3.13-2.

*Affected Area within the VSA:* The Los Mogotes peaks area is an area of tribal importance with an indefinite boundary. The Los Mogotes East SEZ is located on an east-facing slope northeast of the Los Mogotes peaks. From some portions of the VSA, the SEZ is at least partially screened by foreground vegetation and topography. Visibility from the Los Mogotes peaks area is limited to primarily the peaks and east- and northeast-facing slopes.

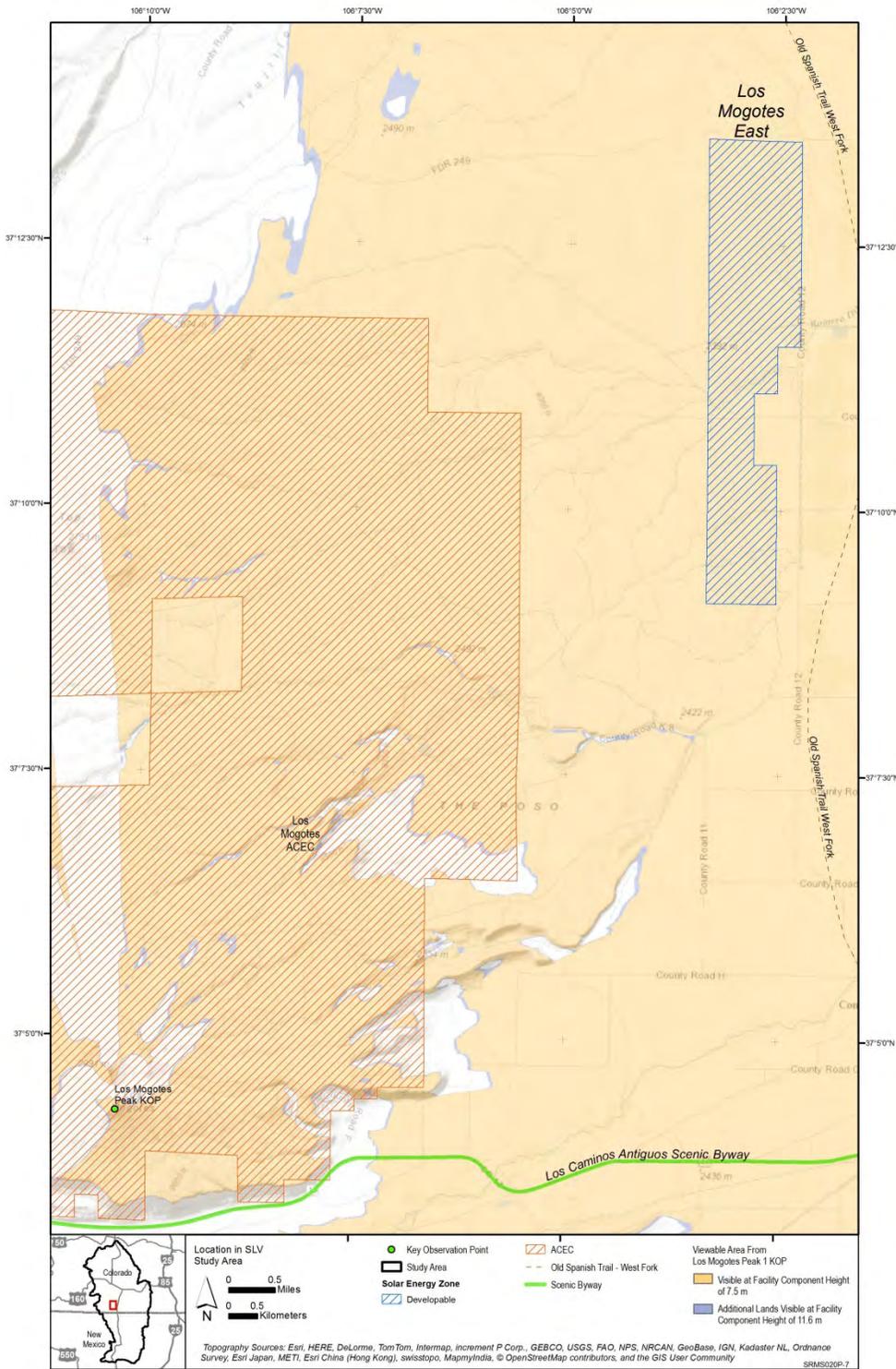
The Antonito Southeast SEZ is located on the flat valley floor southeast of the Los Mogotes peaks. Almost the entire SEZ is visible from the Los Mogotes Peak KOP, except a small area in the far eastern portion of the SEZ that is screened by the South Piñon Hills. Visibility from the Los Mogotes peaks area is limited to primarily the peaks and south-, southeast-, and east-facing slopes.

*Estimated Annual Visitation/Usage in VSA:* Estimated annual visitation numbers for the Los Mogotes peaks area are not available; however, BLM states that usage of the area will be low because of limited access and a lack of areas of general interest (Brown 2015a).

*Types of Activities within the Affected Area:* The Los Mogotes peaks area has cultural/religious significance to Native American tribes with historic ties to the SLV. BLM indicates that it is possible that Native Americans still visit this peak for ritual and traditional purposes (Brown 2015a). Other visitors would include ranchers, hunters, birders and other wildlife viewers, and hikers (Brown 2015a).

*Estimated proportion of visitors conducting each major activity type:* Most visitors to the Los Mogotes peaks area would likely be participating in the activities listed above; however percentages of people conducting each type of activity are not known.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* The Los Mogotes peaks area has cultural/religious significance to Native American tribes with historic ties to the SLV. The peaks are also within the Los Mogotes ACEC; however, the ACEC was established to protect its wildlife resources (BLM 2012) rather than its scenic values.



**Figure 3.13-1: Viewshed from Los Mogotes Peak KOP, Including Los Mogotes East SEZ**

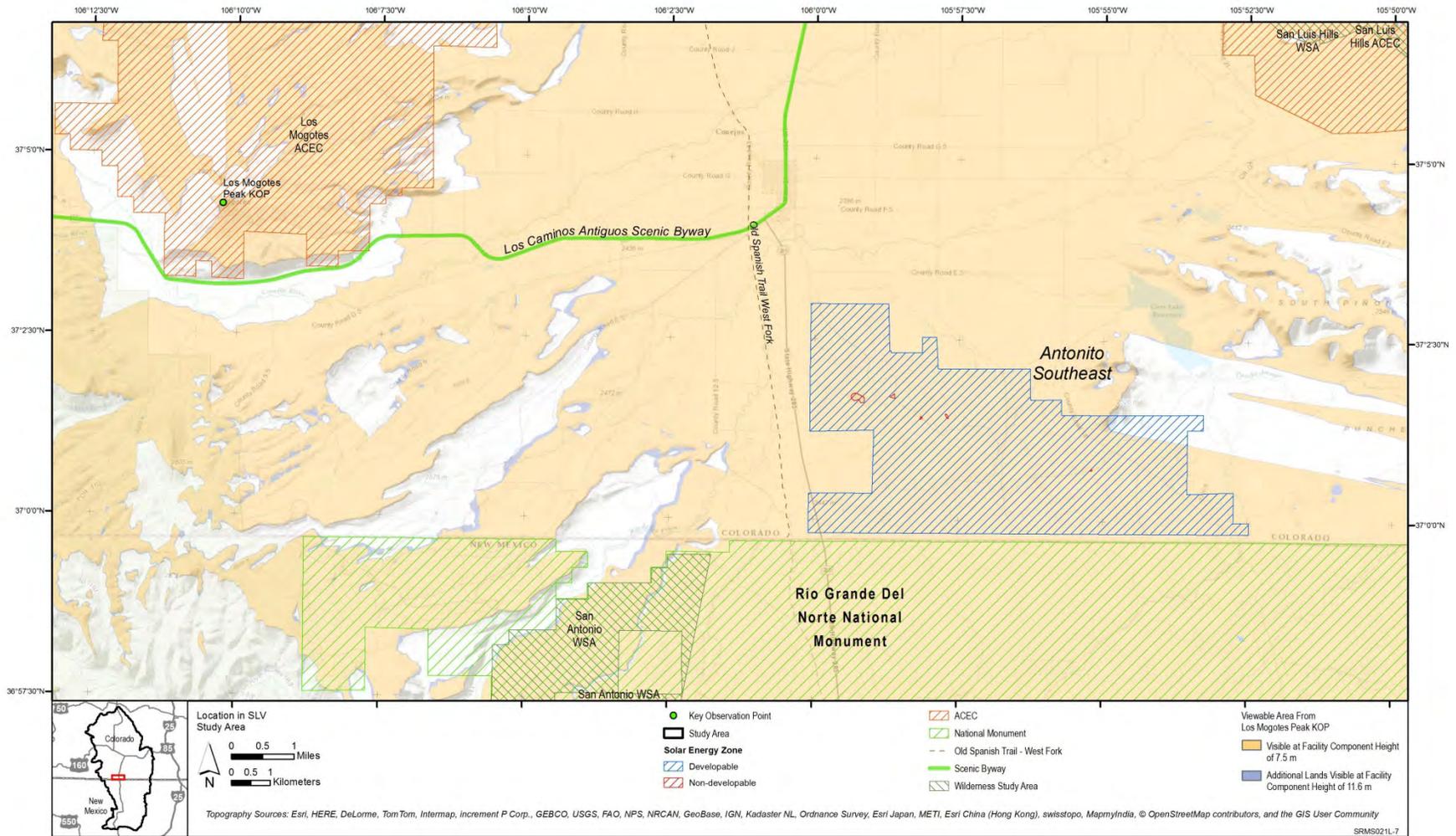


Figure 3.13-2: Viewshed from Los Mogotes Peak KOP, Including Antonito Southeast SEZ.

### 3.13.2 KOP Description

*KOP Name:* Los Mogotes Peak

*KOP Location:* Representative KOP is located within the Los Mogotes ACEC, at the summit of the southernmost of the three Los Mogotes peaks. See Figure 3.13-2.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* This KOP was selected as a representative view from the Los Mogotes peaks area. Because it is very close to a mountain peak, it is a likely location for visitors to use for scenic viewing.

*KOP Access Modes:* High-clearance vehicle for very rough unpaved roads to base of peak, followed by strenuous 30-minute off-trail hike.

### 3.13.3 Visual Context

*General Description:* This KOP offers a panoramic view of nearly the entire San Luis Valley, the northern Taos plain, the San Juan Mountains to the west, Ute Peak, San Antonio Mountain and additional peaks of Native American cultural importance to the south and west within the Rio Grande Del Norte National Monument. There is a stand of large trees near the peak that may screen the view of one or both SEZs, depending on viewer location; however, this does not affect views from many locations within the Los Motes peaks area. Solar facilities within the SEZs would be seen on the valley floor, from an elevated position. See Figure 3.13-3.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, agricultural fields, roads, farm buildings, distribution lines, small town development, industrial development, grazing land, holding ponds.

*Direction of View toward SEZ:* Northeast (Los Mogotes East SEZ), Southeast (Antonito Southeast SEZ)

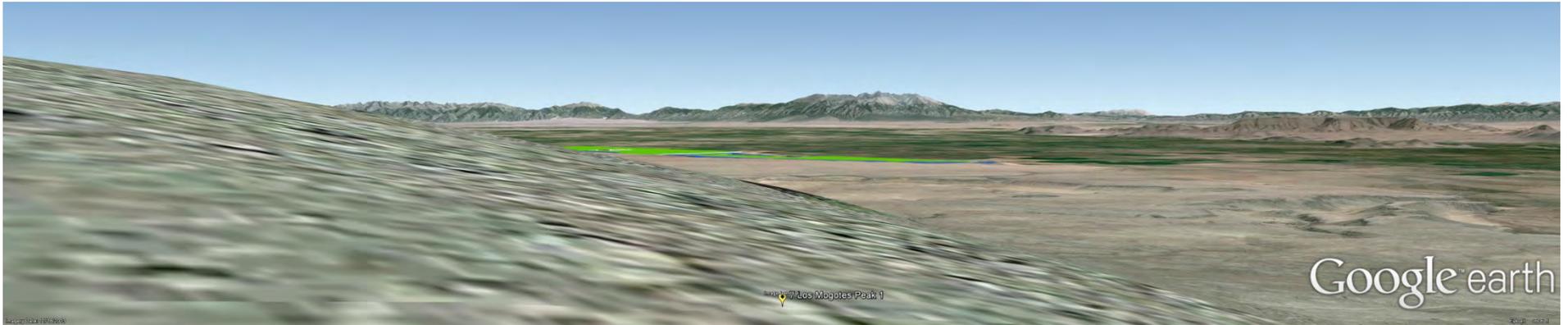
*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approximately 24° (Los Mogotes East SEZ). Approximately 21° (Antonito Southeast SEZ). See Figure 3.13-4.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire Los Mogotes East SEZ is within the GIS-calculated viewshed of the KOP. The KOP viewshed includes 9,381 ac or 96% of the Antonito Southeast SEZ.

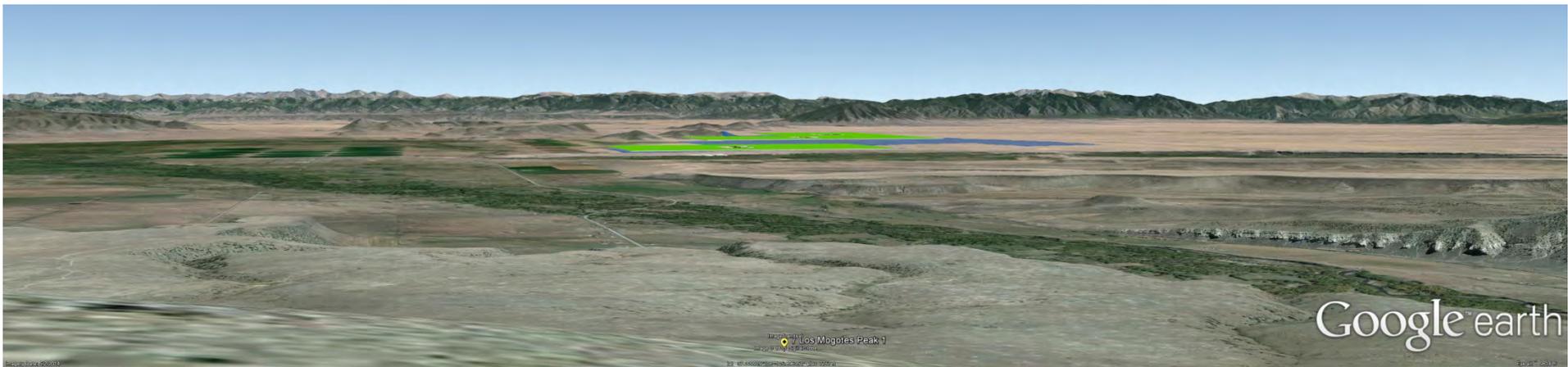
*Orientation of the solar energy development within the field of view:* The view from the KOP naturally centers on San Antonio Mountain, which is visually prominent. Antonito Southeast SEZ is to the left of approximate center of the view; Los Mogotes East SEZ is at the far left of the view.



**Figure 3.13-3 Photograph of Existing Landscape from Los Mogotes Peak KOP Looking toward San Antonio Peak. Antonito Southeast SEZ is Visible to the Left of San Antonio Peak; Los Mogotes East SEZ Is Visible at the Far Left**



**Figure 3.13-4 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from Los Mogotes Peak KOP**



**Figure 3.13-5 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from Los Mogotes Peak KOP**

### 3.13.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* BLM visual contrast ratings for views of the two SEZs were conducted for the Los Mogotes Peak KOP on August 12, 2014, using Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZs. The scanned form is available in Appendix A. The contrast ratings are presented in Table 3.13-1 and 3.13-2.

**Table 3.13-1 Visual Contrast Rating: Los Mogotes East SEZ, as Seen From Los Mogotes Peak KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√			√				√		
	Line			√			√				√		
	Color	√				√				√			
	Texture			√			√					√	

The overall contrast rating for the view of the Los Mogotes East SEZ from the Los Mogotes Peak KOP is *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

Table 3.13-2 Visual Contrast Rating: Antonito Southeast SEZ, as Seen From Los Mogotes Peak KOP													
DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√		√					√		
	Line			√		√				√			
	Color	√				√				√			
	Texture			√				√				√	

The overall contrast rating for the view of the Antonito Southeast SEZ from the Los Mogotes Peak KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast demands attention, will not be overlooked, and is dominant in the landscape.*” This corresponds most closely to the VRM Class IV objective. The VRM Class IV objective from Manual 8431 is “*...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- Distance.** Solar development within the Los Mogotes East SEZ would be visible at a distance of 8.4 to 12.8 mi from the KOP, and solar development within the Antonito Southeast SEZ would be visible at a distance of 9.5 to 17.2 mi from the KOP. Except for the extreme eastern portions of the Antonito Southeast SEZ, this distance is in the BLM background distance zone; however, it is close enough that the shapes and colors of structures within the SEZ would likely be visible. Surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements.

- **Angle of Observation.** The KOP is on a low mountain peak, and the SEZs are on the relatively flat valley floor, so that viewers at the KOP would be looking down onto solar facilities in both SEZs. The full extent of the Los Mogotes East SEZ and almost the entirety of the much larger Antonito Southeast SEZ would be visible. The high-angle view would make the rectilinear geometry of the structures and various facilities within the SEZs more apparent. For the Antonito Southeast SEZ, clearing of vegetation for the facilities and roads over such a large area would be apparent, and the clearing and color of the collector/reflector arrays would contrast strongly with the existing vegetation under most viewing conditions.
- **Length of Time the Project Is In View.** View duration would depend on the type of activity the viewers are engaged in; however, the panoramic view of the SLV with San Antonio Mountain prominent in the view attracts visual attention, and might prolong views for many visitors.
- **Relative Size or Scale.** Buildings within the SEZ would be far enough away that they would blend well with existing structures with respect to size; however, the SEZs cover a substantial portion of the horizontal field of view (24° and 21°, respectively). The facilities within the SEZs, viewed collectively, would be larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZs would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels, but there would be very few visitors to the KOP area in snow conditions. Contrasts would likely be lower when vegetation was darker in color, especially for PV facilities. Because of the elevated viewpoint and open nature of the landscape between the KOP and the SEZs, defoliation of trees in the fall would not change views of solar development in the SEZ substantially. In certain conditions when air temperatures were low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.
- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is southwest of the Los Mogotes East SEZ, and just north of due west of the Antonito Southeast SEZ, incidence of glare from both PV and parabolic trough collector/reflector arrays could occur, primarily in the afternoons at certain times of the year. When glare occurred, it could be

annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Although the SLV has numerous lights visible at night, the SEZs are located in areas currently devoid of lighting, and the increase in lighting associated with solar facilities might be noticeable, particularly for the Antonito Southeast SEZ.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZs would be observed on the valley floor from a relatively high vertical angle of view. The low forms and generally horizontal lines of the solar developments within the SEZs would be somewhat compatible with the horizontal lines of roads and field edges and low forms of buildings in the existing landscape. San Antonio Mountain is prominent in the view, and draws visual attention strongly. This would focus viewer attention away from solar facilities in the SEZs, particularly Los Mogotes East SEZ; however, the visual contrast from the Antonito Southeast SEZ would likely be too strong to be overlooked.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, and especially for facilities in the far eastern portion of the Antonito Southeast SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.13.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The Los Mogotes peaks area has cultural/religious significance to Native American tribes with historic ties to the SLV, and it is possible that Native Americans still visit this peak for ritual and traditional purposes (Brown 2015a). Other visitors to the KOP area might be participating in recreation activities such as hiking, wildlife viewing, backpacking, and photography and would be able to see industrial development anytime they look into the SLV, Industrial development is inconsistent with the natural-appearing and rural visual character of the

surrounding landscape. Some tribal and other visitors might find the view of industrial-scale solar facilities unattractive and inappropriate in this landscape setting, or disruptive to the activities in which they are engaged.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZs would be visible to casual observers with unobstructed views looking east or northeast in the SLV. Solar facilities within the Antonito SEZ at the 80% buildout analyzed here would command visual attention, while facilities within the Los Mogotes SEZ would be less noticeable, but still would be seen by casual observers in most lighting conditions.

If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents would make them likely to dominate the view, if only briefly. Regardless of solar technology, during glare incidents, the bright reflected light would likely attract the attention of casual observers.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions.* Most visitors to the Los Mogotes peaks area would be considered to be sensitive viewers, and some might be highly sensitive. Solar facilities in one or both of the SEZs would be plainly visible to visitors on the peaks and on northeast-, east-, southeast-, and south-facing slopes of the Los Mogotes peaks area. Visitation is thought to be very low (Brown 2015a). There is a variety of other development visible within the San Luis Valley, and some visual characteristics of solar facilities would be compatible with other development in the valley; however, the high reflectivity of the collector/reflector arrays and very large size of the facilities and the SEZs as a whole would make them visually prominent.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them generally less noticeable than parabolic trough facilities, but because of the size of the SEZs, they would still be noticeable as large blocks of dark or light color of an unnatural evenness, and likely with obviously artificial geometry. When glare events occurred and caused bright reflections strong visual contrast would sometimes be observed; however, glare events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they could add very little light pollution, but would still be visible.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Solar facilities in both the Los Mogotes East and Antonito Southeast SEZs would be visible from some locations

near the Los Mogotes peaks. In most locations within the area, cumulative impacts would occur primarily because of sequential viewing of the SEZs, because screening and viewing geometry makes it difficult to see both SEZs at the same time.

### **3.13.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Los Mogotes East and Antonito Southeast SEZs would be noticeable to casual observers in the Los Mogotes peaks area, and could cause moderate to strong visual contrasts depending on the viewer location. At least some viewers would be considered sensitive to industrial development, but a variety of cultural modifications are seen throughout the San Luis Valley, so the existing views are generally not natural-appearing. Cumulative visual impacts from simultaneous and sequential viewing of solar facilities within the SEZs would be substantial, but would mostly be limited to sequential viewing. Despite the moderate to strong visual contrast that would be expected, and the likely sensitivity of some viewers, the current estimated visitation to the ACEC is so low that the total visual impact cannot be considered significant. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the Los Mogotes peaks area as a result of solar development in the Los Mogotes East and Antonito Southeast SEZs. However, it should be noted that the potential sensitivity of the area to tribes, and the sensitivity of tribal viewers engaged in ceremonial or other activities cannot be judged without more information, and if these sensitivities are large, they potentially could justify regional compensatory mitigation.

### **3.14 Community of Antonito (Also Critical KOP for Cumbres & Toltec Scenic Railway, and Representative KOP for Los Caminos Antiguos Scenic and Historic Byway)**

#### **3.14.1 VSA Description**

*VSA Type:* Community

*Potentially Impacting SEZ:* Antonito Southeast SEZ, Los Mogotes East SEZ

*Distance from SEZ to Affected Area within VSA:* The distance from the closest point in the community to the closest point in the Antonito Southeast SEZ is approximately 1.6 mi. The distance from the closest point in the community to the farthest visible point in the Antonito Southeast SEZ is approximately 9 mi. See Figure 3.14-1.

*Affected Area within the VSA:* The Antonito Southeast SEZ is located on an open plain south-southwest of Antonito. In most parts of Antonito, the SEZ is largely screened by structures or vegetation, including trees lining the Rio San Antonio. Visibility from Antonito is limited to primarily the southern edge and the southern portion of the western edge of the community, and residents in these areas would be more likely to see the SEZ on average. BLM has confirmed the results of two site visits that determined that views of the Antonito Southeast SEZ are screened from view along most of the southern and southwestern edges of the community as well (Brown 2015a); however, there would likely be visibility from some locations on the outskirts of Antonito.

The Los Mogotes East SEZ is located on an east-facing slope, northwest of Antonito. Viewshed analysis shows that a very small area in the southwest corner of the SEZ could potentially be visible from portions of Antonito. See Figure 3.14-2. The SEZ is generally lower in elevation than Antonito, except the southwest corner of SEZ, which is approximately 20 ft higher than Antonito. However, in and around Antonito, solar development in the Los Mogotes SEZ would likely be fully screened by structures or vegetation between the community and the SEZ, especially the thick vegetation (trees and shrubs) along the Conejos River. In leaf-off conditions, the screening would still be thick enough to obscure the view of the very small potentially visible part of the SEZ sufficiently so that no impacts would be expected.

U.S. 285/CO-17 passes through Antonito, and is designated as part of the Los Caminos Antiguos Scenic and Historic Byway. In the vicinity of Antonito, views of solar development in the Los Mogotes SEZ would also be screened from U.S. 285/CO-17, and no impacts would be expected.

*Estimated Annual Visitation/Usage in VSA:* The population of Antonito is 781 people (US Census 2010). In addition, people passing through Antonito might see the SEZ while driving. CDOT estimated 2,500 vehicles passed through Antonito each day in June 2010, which suggests that approximately 700,000 viewers might pass through in an average tourist season (Brown

2015a). Persons using these roads would be a mixture of locals, tourists and truckers. Many of the views would be repeated views for commuters.

*Types of Activities within the Affected Area:* Driving, walking, recreation, and other activities associated with living in a small community.

*Estimated proportion of visitors conducting each major activity type:* CDOT estimates that up to a few thousand vehicles per day pass through Antonito. The population of Antonito is 781 people (US Census 2010). Thus the majority of viewers would be drivers or passengers in vehicles passing through the area. Much of this traffic is likely to be local residents going to and from work, school, shopping, etc. An unknown but small percentage of travelers through Antonito would likely stop in Antonito, and potentially be exposed to views of the SEZ during their visit.

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* No master plan was found for Antonito. Currently, the affected area of Antonito is primarily in residential use; however, some small businesses and the Cumbres & Toltec Scenic Railway Depot (site of the Antonito KOP) are also located on the southern edge of Antonito, and have limited views of the SEZ.

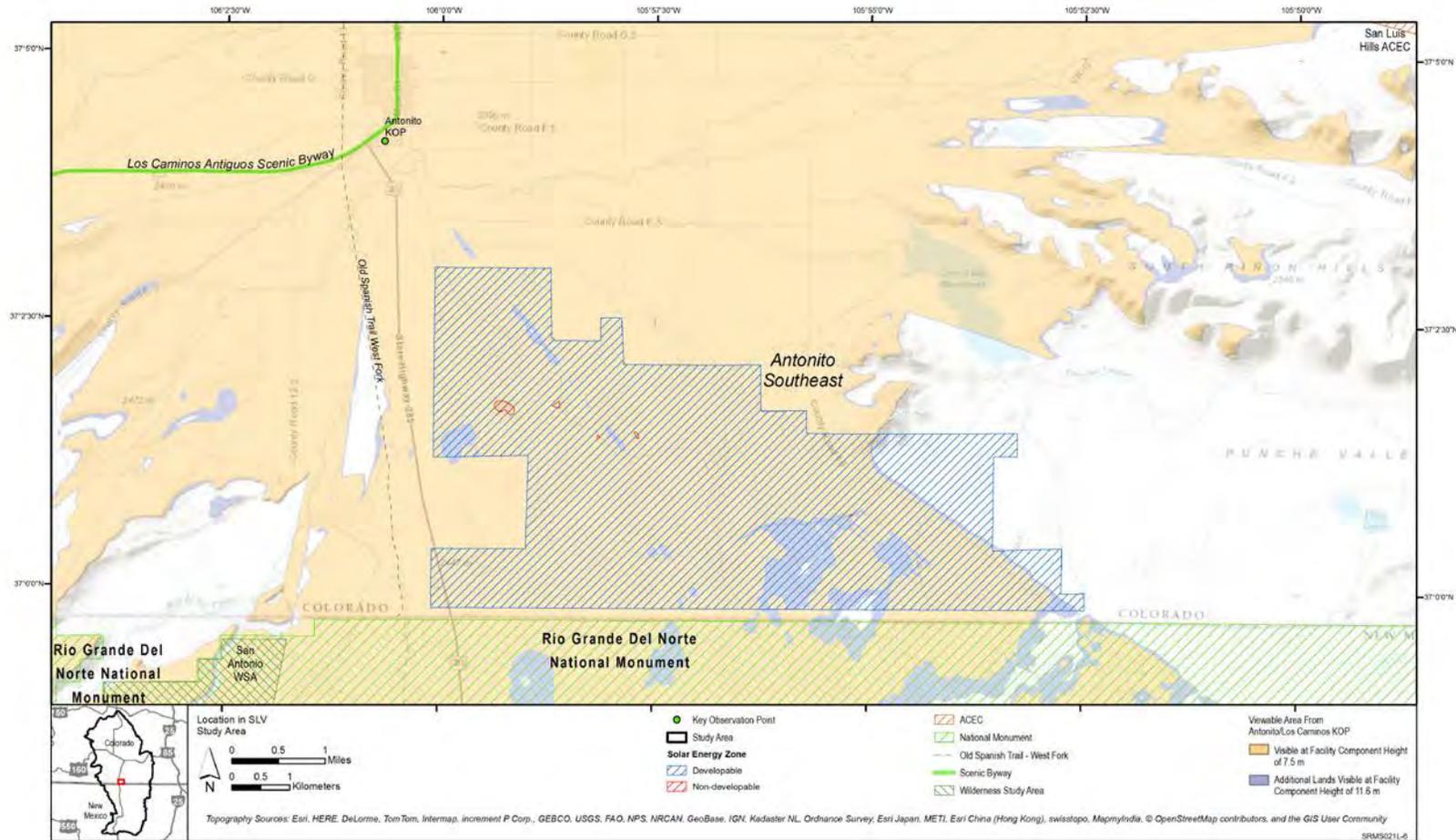


Figure 3.14-1: Viewshed from Antonito KOP, including Antonito Southeast SEZ

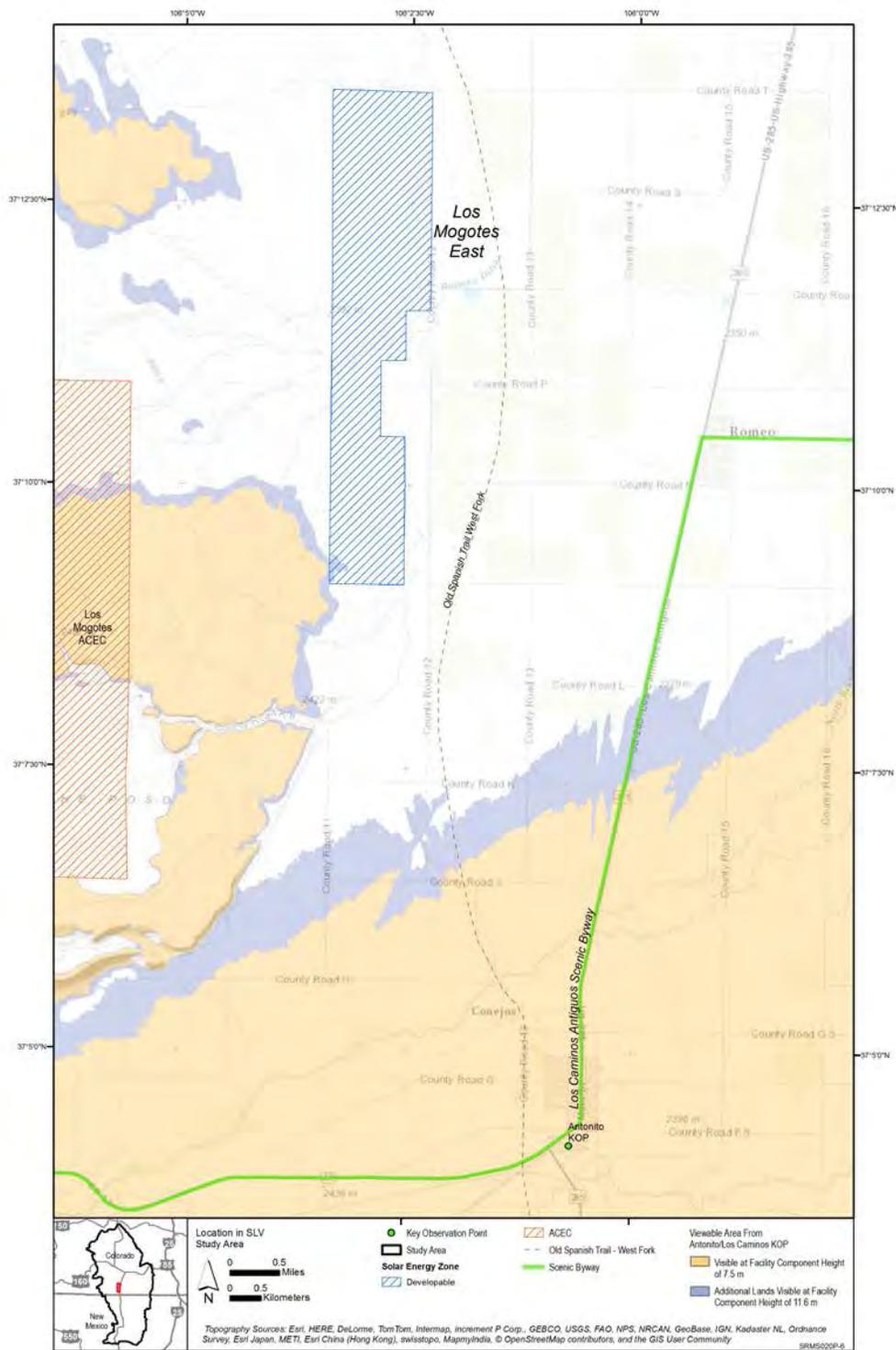


Figure 3.14-2: Viewshed from Antonito KOP, including Los Mogotes East SEZ

### 3.14.2 KOP Description

*KOP Name:* Antonito/Los Caminos KOP

*KOP Location:* This KOP is located at the Cumbres and Toltec Scenic Railway Depot in Antonito, on US-285. See Figure 3.14-1.

*Critical or Representative KOP:* Representative, critical.

*Critical Nature of Affected View (if applicable):* This KOP is located at the Cumbres and Toltec Scenic Railway Depot. Tourists often stop at the C&T RR Depot to observe and photograph the railroad equipment and facilities. Train excursions also leave and arrive at this location. (Brown 2015a).

*Rationale for Selecting KOP:* This KOP is located at the Cumbres and Toltec Scenic Railway Depot, which is a major tourist destination. This area is heavily promoted by the local tourism industry and the States of Colorado and New Mexico, which co-own the railroad. Visitors often spend a considerable amount of time at the railroad depot and the SEZ might easily be visible for more than an hour from at or near this KOP. It is one of the few places in Antonito that offers any view of the Antonito SE SEZ (Brown 2015a).

This KOP is also representative of the view of the Antonito SEZ from the Los Caminos Antiguos Scenic Byway going south on US-285 through Antonito. For more information on impacts to the Los Caminos Antiguos Scenic and Historic Byway, see Section 3.18.

*KOP Access Modes:* Automobile, truck, bicycle, and foot.

### 3.14.3 Visual Context

*General Description:* Looking south towards the Antonito SEZ from the Cumbres and Toltec Scenic Railroad parking lot. Railroad and other industrial facilities are located in the immediate foreground, and a factory is prominent in the middle foreground. Trees in the middle foreground partially screen more distant areas. Hills and mountains are in the background, including San Antonio Mountain prominent to the southwest. See Figure 3.14-3.

*Cultural Modifications Visible within the KOP Viewshed:* Industrial facilities, transportation facilities, distribution lines, communication towers.

*Direction of View toward SEZ:* South-southwest.

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approx. 49°. Scattered buildings, other structures, and trees along the Rio San Antonio provide partial screening between the KOP (and other locations on the southern and western edges of Antonito) and the SEZ. See Figure 3.14-4.

*Acreage and Percentage of SEZ within KOP Viewshed:* Approximately 8,100 acres or 83% of the SEZ is within the GIS-calculated viewshed of the KOP; however, clumps of trees and shrubs, as well as structures screen much of the view from the KOP toward the SEZ.

*Orientation of the solar energy development within the field of view:* The Antonio Southeast SEZ is partly in the center of the view, but the view of the SEZ is somewhat unbalanced, as the majority of the SEZ is to the left.



**Figure 3.14-3 Photograph of Existing Landscape from Antonito KOP Looking toward Antonito Southeast SEZ**



**Figure 3.14-4 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from Antonito KOP**

### 3.14.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Antonito/Los Caminos KOP on Aug. 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.14-1.

**Table 3.14-1 Visual Contrast Rating for Antonito/Los Caminos KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√			√					√	
	Line			√			√					√	
	Color			√			√			√			
	Texture			√			√					√	

The overall contrast rating for the Antonito/Los Caminos KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

The presence of parabolic trough facilities within the SEZ would be likely to result in increased structure contrast because the tops of structures might be visible above screening vegetation. Contrast might also increase if the facilities had cooling towers or other plume sources, particularly on days when plumes were visible.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Antonito Southeast SEZ would be visible between 1.6 and 9.0 mi from Antonito. This distance is partly in the BLM foreground-middleground distance zone, which is close enough that the shapes and colors of structures within the SEZ would be visible, where screening was absent. Surface details of structures could be visible, and solar collector/reflectors would generally be seen as individual elements in a large array.
- **Angle of Observation.** The SEZ is essentially on a flat plain at roughly the same elevation as the KOP; some parts of the SEZ are slightly higher in elevation than the KOP (generally the western side), and some parts are lower. The angle of view is very low, and where screening was absent, solar facilities would be visible as a very narrow band at the foot of a distant, low mountain ridge.
- **Length of Time the Project Is In View.** For visitors to the KOP (Cumbres and Toltec Railway Depot) views could be extended, as people wait for the train, or photograph and observe the buildings and train engine and cars in the yard, although most views would not be in the direction of the SEZ. For residents of Antonito, where views existed, they could be extended; for residents, solar developments in the SEZ would be visible on a daily basis, in some cases from resident's yards, and from some streets in town. For persons travelling on U.S. 285 and other local roads near Antonito, facilities within the SEZ would be in view very briefly, as screening is widespread and only brief glimpses of solar development in the SEZs would likely be available.
- **Relative Size or Scale.** Because of the extensive screening, as seen from the KOP and Antonito in general, solar facilities within the SEZ would be no larger in horizontal or vertical extent than most other visible objects in the view. Where clear views existed, the solar facilities within the SEZ would spread across a large portion of the view to the south.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create noticeable color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Defoliation of trees in the fall could increase visibility of solar facilities in the SEZ. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because Antonito is almost due north of the SEZ, glare events are unlikely. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. The SEZ area is essentially unlit at night; however, Antonito itself is well lit, and presumably the factory north of the SEZ has lighting, and much of the view of the SEZ is screened in any event.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view through screening vegetation and structures. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape, including the row of trees along the Rio San Antonio. The blocky forms of structures within the solar facilities could be visible above the solar arrays if they were not screened, but would blend with the other closer structures visible between Antonito and the SEZ.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but because of the relatively short distance between Romeo and the SEZ, would not affect visibility strongly on most days.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.10.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Antonito is a small community in a rural area with substantial views of agricultural, rural, and, to the south in the direction of the SEZ, industrial landscapes. Residents

of Antonito might be able to see partially screened industrial development in the SEZ anytime they look to the south from the southern or western edge of their community, and when driving through the local area. Most of the vehicular traffic is likely to be local residents going to and from work but with substantial numbers of tourists stopping at the Cumbres and Toltec Scenic Railway Depot. Some local residents might be sensitive to the change in the landscape. Industrial development is inconsistent with the rural visual character of much of the surrounding landscape, but industrial facilities are plainly visible in the direction of the SEZ, and solar facilities, though different in appearance, would be compatible as a land use type. Where it was visible, some residents might find the view of industrial-scale solar facilities unattractive and inappropriate, and some tourists may be sensitive to a change in the natural and rural appearing landscape, especially if they are frequent visitors.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be visible to persons on the southern and western edges of Antonito with unobstructed views looking directly at the SEZ; however, views of all or some of the SEZ would be screened by vegetation and structures for most locations within Antonito. If parabolic trough facilities were located in the SEZ, the height of the solar collector array, various buildings and other structures, presence of plumes under some conditions might attract visual attention, but even on the southern edge of Antonito, most views would be limited and partially screened. Expected visual contrast would be weak, and casual observers would not likely notice the solar facilities at all. Given that Antonito is north of the SEZ, glare incidents are unlikely.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* The residents of Antonito would be considered to be sensitive viewers. Solar development within the SEZ might be visible to a small number of residents on a daily basis and potentially for extended viewing periods. The other residents would likely view solar development in the SEZs briefly while driving to and from their homes. Solar development in the SEZ would likely not be visible to persons driving through Antonito.

As seen from Antonito, where it was visible at all, solar development in the Antonito Southeast SEZ would appear as a horizontal band of dark or light color (depending on technology type and lighting) with the angular forms of buildings visible projecting above it. The thin band of the solar arrays would be partially obscured by shrubs, small trees, and structures in the foreground of views from Antonito. It would not likely be noticed by casual observers.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would be less visible than the taller, more complex, and more reflective components of parabolic trough facilities. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, causing very little light pollution, and thus causing minimal night sky impacts.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them more visible than PV facilities.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* The De Tilla Gulch SEZ is too far from Antonito to cause visual impacts. As discussed above, views of solar facilities in the Los Mogotes East SEZ would be screened by vegetation, structures, and topography. As a result, no cumulative visual impacts from solar development within Antonito Southeast SEZs are anticipated for viewpoints in or near Antonito.

### **3.10.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Los Mogotes East SEZ would not be visible from Antonito, the Cumbres and Toltec Scenic Railway Depot, or the Los Caminos Antiguos Scenic and Historic Byway within Antonito. There would be very limited visibility of solar energy development in the Antonito Southeast SEZ from these locations, because of screening of much of the view by vegetation and structures. The visual contrast rating for the Antonito/Los Caminos KOP indicated that solar development in the Antonito Southeast SEZ would create only weak visual contrasts overall, under normal viewing conditions. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur in the community of Antonito, the Cumbres and Toltec Scenic Railway Depot, or the Los Caminos Antiguos Scenic and Historic Byway as a result of solar development in the SEZs. For more information on impacts to the Cumbres and Toltec Scenic Railway, see Section 3.15. For more information on impacts to the Los Caminos Antiguos Scenic and Historic Byway, see Section 3.18.

### **3.15 Cumbres & Toltec Scenic Railway (Representative KOPs: Cumbres & Toltec Scenic Railway Water Tank, Cumbres & Toltec Scenic Railway Depot)**

#### **3.15.1 VSA Description**

*VSA Type:* Specially Designated Area

*Potentially Impacting SEZs:* Antonito Southeast SEZ

*Representative KOPs:* Cumbres and Toltec Scenic Railroad (C&T RR) Water Tank, C&T RR Depot. The Cumbres and Toltec Scenic Railroad (C&T RR) Water Tank is also a representative KOP for the Rio Grande del Norte National Monument.

*Distance from SEZ to Affected Area within VSA:* The distance from the closest point on the Cumbres and Toltec Scenic Railroad (C&T RR) to the closest point in the Antonito Southeast SEZ is approximately 1.5 mi. The distance from the closest point in the C&T RR to the farthest visible point in the Antonito Southeast SEZ is approximately 9 mi. See Figure 3.15-1.

*Affected Area within the VSA:* From the parking lot of the C&T RR, the Antonito Southeast SEZ would be visible, although buildings and vegetation screen much of the view. As a C&T RR excursion train leaves or returns to Antonito, solar facilities in the Antonito Southeast SEZ could be visible depending on where the train is, and where in the train a viewer is sitting. BLM states that open views of the Antonito SEZ occur for about an hour of the excursion train ride.

*Estimated Annual Visitation/Usage in VSA:* In 2013, more than 34,535 visitors rode the C&T RR (trains run May to October) (C&T RR 2013). In addition, tourists often stop at the C&T RR depot to observe and photograph the railroad equipment and facilities.

*Types of Activities within the Affected Area:* Riding the train, photography, scenic viewing.

*Estimated proportion of visitors conducting each major activity type:* No information on the proportion of visitors taking part in particular activities is available.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* The C&T RR is a National Historic Landmark, and part of the area through which it runs is a BLM ACEC designated to protect scenic views for the C&T RR. Friends of the Cumbres and Toltec Scenic Railroad have developed a master interpretive plan with the intent to “lay the intellectual groundwork for the further development of expanded interpretation of the history, science, and technology associated with the Cumbres & Toltec Scenic Railroad.” “...enhanced interpretive opportunities are proposed ... for facilities at Cumbres Pass and at Antonito and Osier, Colorado” (Andrew Merrell & Associates 2010). Also, the C&T RR is heavily promoted by the local tourism industry and the States of Colorado and New Mexico, which co-own the railroad.

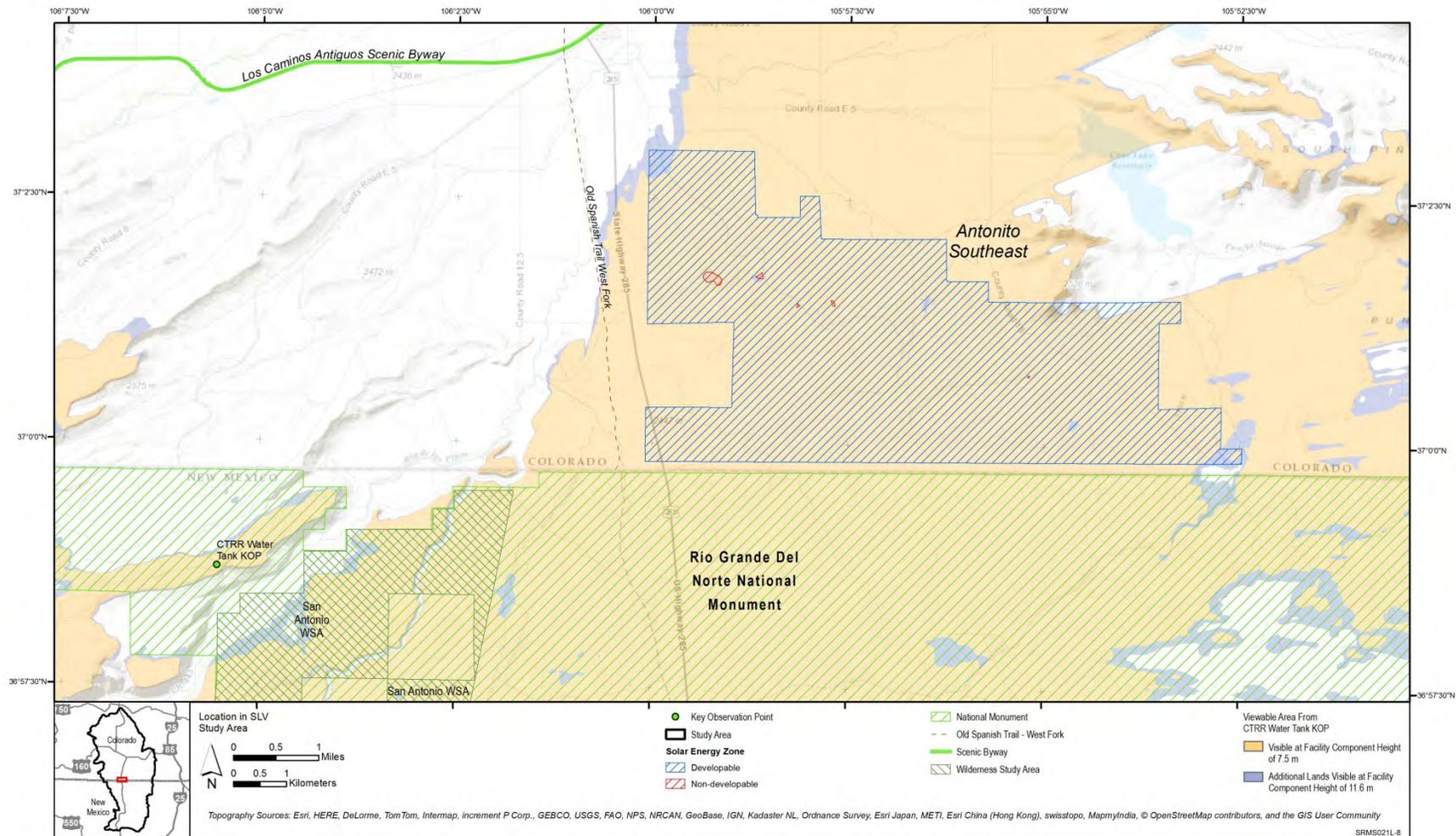


Figure 3.15-1: Viewshed from C&T RR Water Tank KOP, including Antonito Southeast SEZ

### 3.15.2 KOP Description

*KOP Name:* C&T RR Water Tank (Lava Tank)

*KOP Location:* This KOP is located at the C&T RR Water Tank (also known as the Lava Tank), along the C&T RR line in New Mexico, above CR 433, near the community of Los Pinos. See Figure 3.15-1.

*Critical or Representative KOP:* Representative, critical.

*Critical Nature of Affected View (if applicable):* The water tank is an abandoned but maintained structure that tourists sometimes visit (Brown 2015a).

*Rationale for Selecting KOP:* This KOP is representative of the view of the Antonito SEZ while riding the C&T RR. The view from this KOP is typical for up to 1 hour of the train ride. (Brown 2015a).

*KOP Access Modes:* Railcar, high-clearance vehicle.

### 3.15.3 Visual Context

*General Description:* Looking northeast towards the Antonito SEZ from the Cumbres and Toltec Scenic Railroad water tank onto an unobstructed panoramic view of a natural-appearing landscape. Railroad tracks in the foreground. Ute Mountain is visible to the southeast in the distance. See Figure 3.15-2.

*Cultural Modifications Visible within the KOP Viewshed:* Train tracks, local roads, highways, farm buildings, small-town development, grazing land, railcars, vehicles.

*Direction of View toward SEZ:* East-northeast

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approx. 38°. See Figure 3.15-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire SEZ is within the GIS-calculated viewshed of the KOP.

*Orientation of the solar energy development within the field of view:* The Antonio Southeast SEZ is slightly left of center in the view.



**Figure 3.15-2 Photograph of Existing Landscape from CT&RR Water Tank KOP Looking toward Antonito Southeast SEZ**



**Figure 3.15-3 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from CT&RR Water Tank KOP**

### 3.15.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the CT&RR Water Tank KOP on Aug. 12, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.15-1.

**Table 3.15-1 Visual Contrast Rating for CT&RR Water Tank KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√			√					√	
	Line			√			√					√	
	Color	√					√			√			
	Texture			√				√				√	

Primarily because of the relatively short distance to the SEZ, the wide angle of view occupied by the SEZ, and the elevated viewpoint of the KOP, the overall contrast rating for the view of the Antonito Southeast SEZ from the CT&RR Water Tank KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast demands attention, will not be overlooked, and is dominant in the landscape.*” This corresponds most closely to the VRM Class IV objective. The VRM Class IV objective from Manual 8431 is “*...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.*”

Contrast would be strong regardless of the solar technology type, but parabolic trough facilities within the SEZ would likely cause greater visual contrast than PV facilities because parabolic trough facilities have an overall higher vertical profile, more and larger structures, more complex structures, more reflective surfaces, and depending on the cooling technology employed, may have cooling ponds, and water vapor plumes.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Antonito Southeast SEZ would be visible between 5.2 and 12.1 mi from the CT&RR Water Tank KOP. This distance is in the BLM background distance zone; however, it is close enough that the shapes and colors of structures within the SEZ would be visible. Surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements.
- **Angle of Observation.** The SEZ is essentially on a flat plain 500-800 ft lower in elevation than the KOP, which is on a mesa. The slightly high-angle view would make the rectilinear geometry of the structures and various facilities within the SEZ more apparent. Clearing of vegetation for the facilities and roads over such a large area would be apparent, and the clearing and color of the collector/reflector arrays would contrast moderately to strongly with the existing landscape elements under most viewing conditions.
- **Length of Time the Project Is In View.** For visitors to the KOP views could be extended as they enjoy the striking panoramic view from the KOP. For persons riding on the side of the train facing the SEZ, views of the SEZ could be a few minutes long.
- **Relative Size or Scale.** Buildings and particularly the solar collector/reflector arrays within the SEZ could be close enough that they would appear larger than existing structures, which are all distant and quite small in the current view. The SEZ would cover a substantial portion of the horizontal field of view (38°), and facilities within the SEZ, viewed collectively, would be larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create noticeable color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels; however the train does not run in the months most likely to have lasting snow cover. Because the few and widely scattered trees around the KOP are evergreen, defoliation of trees in the fall would not increase visibility of solar facilities in the SEZ. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.
- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track

the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is southwest of the SEZ, glare events would be possible, and likely to occur primarily in the afternoons at certain times of the year. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. The SEZ area is essentially unlit at night; and while there are many lights visible in the SLV, solar facility lighting in the SEZ would be noticeable if there were visitors at the KOP at night, which is unlikely.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a slightly elevated angle of view. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape; however, the blocky forms of structures within the solar facilities could be visible above the solar arrays, and would contrast with the existing landscape.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but because of the relatively short distance between the KOP and the SEZ, would not affect visibility strongly on most days.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.15.5 KOP Description

*KOP Name:* CT&RR Scenic Railway Depot

The complete KOP description and contrast discussion for the CT&RR Scenic Railway Depot is available in the Community of Antonito/Los Caminos KOP impact discussion. The Community of Antonito/Los Caminos KOP is located at the CT&RR Scenic Railway Depot. See Sections 3.14.2-3.14.5 for discussion of the Antonito/Los Caminos KOP contrast and impact assessment.

As noted in Section 3.14.4, the overall contrast rating for the Antonito/Los Caminos KOP is *Weak*.

### **3.15.6 Impact Assessment**

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The C&T RR is an important and heavily used tourist destination as well as a nationally-designated historic resource. As its name suggests, enjoyment of spectacular and generally rural or natural-appearing landscapes is a key component of the experience of riding the C&T RR train, and BLM has placed special designation on the surrounding lands specifically to protect the scenic resources visible from the C&T RR train. Although industrial elements are visible from the CT&RR depot, and may be visible at some points in the C&T RR train trip, for the majority of the trip, where there are open views of the SLV, the landscape character is primarily natural-appearing or rural. Some C&T RR riders might find the view of industrial-scale solar facilities in the SEZ unattractive and inappropriate, negatively impacting the C&T RR experience.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be plainly visible to persons on the C&T RR excursion train at intermittent intervals, and could not be overlooked. Where there were unobstructed views of the SLV, solar facilities in the SEZ would likely dominate views from the train. Expected visual contrast would be strong, and glare events might occur.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Because they are riding the C&T RR in part for the spectacular views from the train, C&T RR passengers would be considered to be sensitive viewers. As seen from the C&T RR, solar development in the Antonito Southeast SEZ would appear as multiple blocks or polygons of dark or light color (depending on technology type and lighting) with the blocky and angular forms of buildings visible projecting above it. They would extend across a relatively large portion of the field of view, and directly in front of the Sangre de Cristo Mountains, which are an important scenic element of many views in the SLV. Bright reflections from the solar collector/reflector arrays and other facility components would likely be observed at times, including glare events.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would be less visible than the taller, more complex, and more reflective components of parabolic trough facilities. If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, and increased potential for glare would make them more visible than PV facilities. Regardless of the technology employed, at 80% buildout, solar facilities would dominate views of the SLV from

the C&T RR, and introduce a significant incompatible industrial element into a largely natural-appearing landscape.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* The De Tilla Gulch SEZ is too far from the C&T RR to cause visual impacts. The Los Mogotes East SEZ would be screened from view by vegetation, structures, and topography, at almost all points on the C&T RR line, and would cause minimal visual impacts if it was visible from any point on the line. As a result, no cumulative visual impacts from solar development within Antonito Southeast SEZs are anticipated for the C&T RR.

### **3.15.7 Regional Compensatory Mitigation Recommendation**

Although the C&T RR Depot would only be subject to weak visual contrast from solar development in the Antonito Southeast SEZ, solar facilities in the SEZ would be visible from the C&T RR and would likely negatively affect the scenic experience of C&T RR passengers. Although the C&T RR excursion lasts several hours, riders might be exposed to views of solar facilities for up to one hour, and they would be likely to see the extent of solar development in the SEZ. Because the C&T RR is an important and visually sensitive scenic and historic resource, and because many thousands of persons would be exposed to the incompatible industrial character of major solar development in the SEZ, regional compensatory mitigation is recommended as compensation for potential visual impacts that might occur to the C&T RR.

### **3.16 West Fork of the North Branch of the OST (Representative KOPs: West Fork of The North Branch of the OST, “Welcome to Colorful Colorado State Line Sign [Stateline KOP])**

#### **3.15.1 VSA Description**

*VSA Type:* Point of Interest

*Potentially Impacting SEZs:* Los Mogotes East SEZ

*Representative KOPs:* West Fork of the North Branch of the OST, Stateline

*Distance from SEZ to Affected Area within VSA:* The distance from the closest point on the presumed route of West Fork of the North Branch of the OST (presumed trail route) to the closest point in Los Mogotes East SEZ is approximately 0.3 mi. The distance from the closest point on the presumed trail route to the farthest visible point in the Los Mogotes East SEZ is approximately 5.5 mi. See Figure 3.16-1.

The distance from the closest point on the presumed route of West Fork of the North Branch of the OST to the closest point in Antonito Southeast SEZ is approximately 0.3 mi. The distance from the closest point on the presumed trail route to the farthest visible point in the Antonito Southeast SEZ is approximately 7.3 mi. See Figure 3.16-1.

*Affected Area within the VSA:* The SEZ is on an east facing slope, immediately west of what is believed to be the presumed trail route. This segment of the trail is currently under study. Early trails were not single-track routes, but rather travel corridors in which the route of travel varied due to the type of pack animal or vehicle used as well as weather conditions and it is possible that one or more variants of the OST may have crossed the SEZ. The SEZ is in view when travelling in either direction on this nearby segment of the presumed trail route. PV facilities in the Los Mogotes East SEZ could potentially be visible from approximately 23.2 mi of the presumed trail route; however, views of the SEZ are screened by vegetation and structures in some parts of the segment. Parabolic trough facilities in the Los Mogotes East SEZ would be visible from an additional approximately 0.4 mi of the presumed trail route.

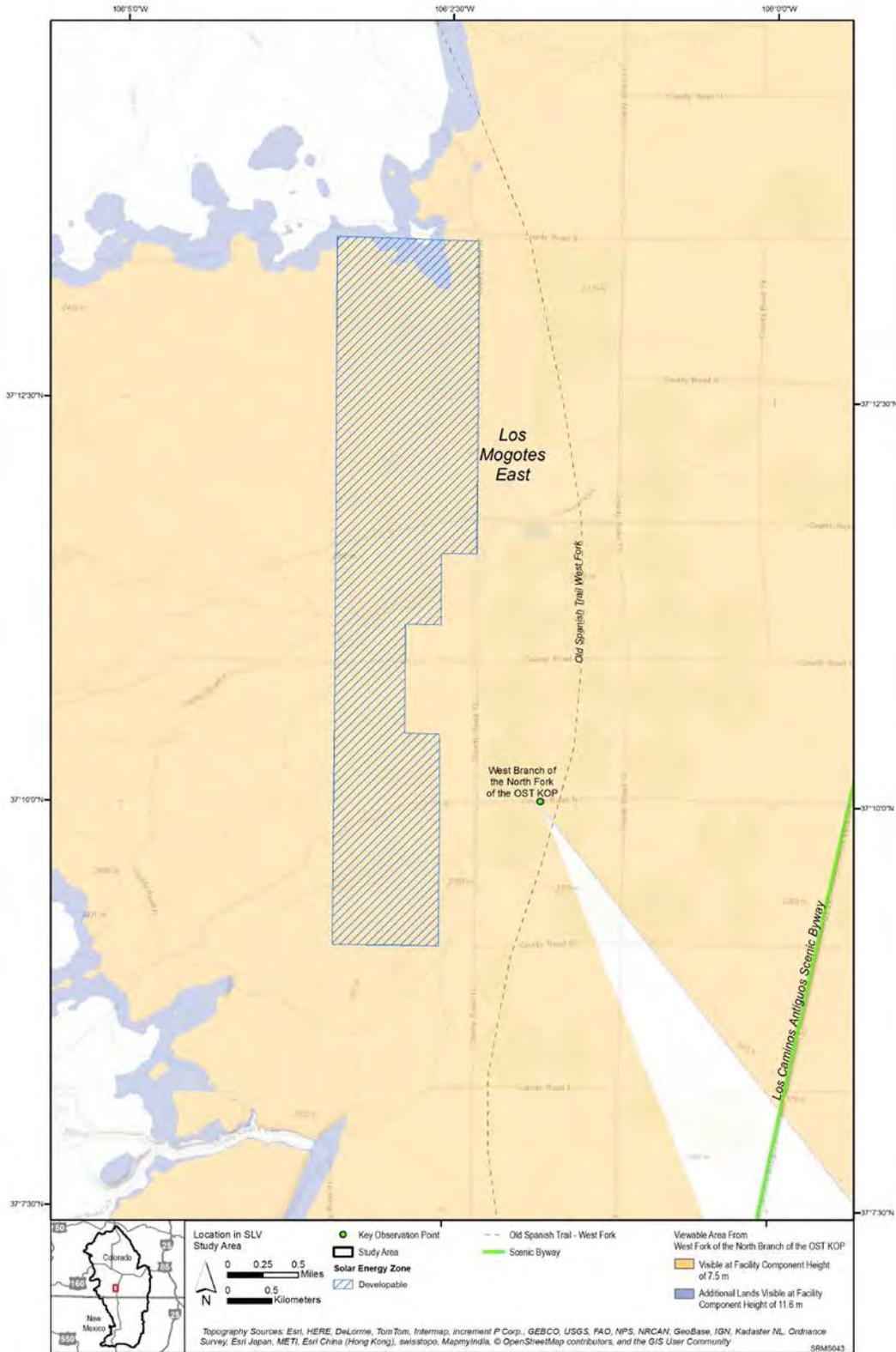
The Los Mogotes SEZ is occasionally visible from most east-west oriented county roads in the area between the SEZ and Highway 285; however, the view of the SEZ is limited due to screening by vegetation and structures until the viewer is very close to the SEZ. The SEZ could be visible for 10 minutes or more from north-south oriented county roads because there is less screening (Brown 2015a).

*Estimated Annual Visitation/Usage in VSA:* BLM suggests an estimate of <100 viewers/day seems reasonable from the number of homes/ranches in the area (Brown 2015a).

*Types of Activities within the Affected Area:* Most of the activity in this area consists of farming and ranching, with traffic on local county roads consisting mostly of local residents. A few hunters may visit the area during hunting season (Brown 2015a). Annual visitation information for those specifically exploring the OST is not available.

*Estimated proportion of visitors conducting each major activity type:* No information on the proportion of visitors taking part in particular activities is available. Vehicular travel estimates for local roads are not available, but much of the traffic in this area is local. It is likely that the vast majority of viewers would be drivers or passengers in vehicles travelling through the area. The remainder would likely be permanent residents or farm workers, or those specifically exploring the Old Spanish Trail.

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* The OST is a congressionally designated historic trail and is promoted as a tourist attraction by state and local Chambers of Commerce, tourist boards and the Old Spanish Trail Association. This portion of the OST is listed as “segment currently under study” on OST maps, and is not yet designated. A *Comprehensive Management Plan and Environmental Impact Statement for the Old Spanish National Historic Trail* is currently under development.



**Figure 3.16-1: Viewshed from West Fork of the North Branch of the OST, including Los Mogotes East SEZ**

### 3.16.2 KOP Description

*KOP Name:* West Fork of the North Branch of the OST

*KOP Location:* This KOP is located on County Road N, approximately 0.5 mi east of County Road 12, 0.7 mi east of the SEZ and 0.1 mi west of the presumed trail route. See Figure 3.16-1.

*Critical or Representative KOP:* Representative.

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* This KOP is representative of the view of the Antonito SEZ from the nearby section of the presumed trail route.

*KOP Access Modes:* Primarily automobile, potentially horseback or hiking.

### 3.16.3 Visual Context

*General Description:* Looking west from a point near the presumed trail route of West Fork of the North Branch of the OST onto a panoramic view of the western portion of the undulating valley floor. Agricultural development dominates the view in the foreground and leads to undulating hills and rugged mountaintops in the background. See Figure 3.16-2.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, farm structures, agricultural fields, grazing land, distribution lines, straw bales, windbreak, and roads.

*Direction of View toward SEZ:* West

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approx. 140°. See Figure 3.16-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* The entire SEZ is within the GIS-calculated viewshed of the KOP, except for approximately 1.5 ac in the northeast portion of the SEZ.

*Orientation of the solar energy development within the field of view:* The Antonio Southeast SEZ is slightly left of center in the view.



**Figure 3.16-2 Photograph of Existing Landscape from West Fork of the North Branch of the OST KOP Looking toward Los Mogotes East SEZ**



**Figure 3.16-3 Google Earth Schematic Visualization of Los Mogotes East SEZ as Seen from West Fork of the North Branch of the OST KOP**

### 3.16.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the West Fork of the North Branch of the OST KOP on Aug. 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.16-1.

**Table 3.16-1 Visual Contrast Rating for West Fork of the North Branch of the OST KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√		√					√		
	Line	√				√					√		
	Color	√				√				√			
	Texture	√					√				√		

Primarily because of the very short distance to the SEZ, the wide angle of view occupied by the SEZ, and the east-facing slope of the SEZ, the overall contrast rating for the view of the Los Mogotes East SEZ from the West Fork of the North Branch of the OST KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast demands attention, will not be overlooked, and is dominant in the landscape.*” This corresponds most closely to the VRM Class IV objective. The VRM Class IV objective from Manual 8431 is “*...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.*”

Contrast would be strong regardless of the solar technology type, but parabolic trough facilities within the SEZ would likely cause greater visual contrast than PV facilities because parabolic trough facilities have an overall higher vertical profile, more and larger structures, more complex structures, more reflective surfaces, and depending on the cooling technology employed, may have cooling ponds, and water vapor plumes.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Los Mogotes East SEZ would be visible between 0.7 and 4.2 mi from the KOP. This distance is in the BLM foreground-middle ground distance zone; close enough that the surface details of structures would be discernable, and solar collector/reflectors would generally be seen as individual elements.
- **Angle of Observation.** The southern portion of the SEZ is slightly elevated and tilted eastward toward the KOP. The tilt would make the rectilinear geometry of the structures and various facilities within the SEZ more apparent. Clearing of vegetation for the facilities and roads in the SEZ would be apparent, and the clearing and color of the collector/reflector arrays would contrast strongly with the existing landscape elements under most viewing conditions.
- **Length of Time the Project Is In View.** For persons exploring this segment of the OST by vehicle, solar development could be in view for 20 minutes or longer when travelling on north-south oriented roads. For those exploring the trail by other means (i.e. horseback, foot, bicycle) visibility would vary depending on mode of transportation and activities being conducted. For persons travelling on other local roads, the SEZ would be intermittently screened by vegetation and structures, and views would generally be brief, typically a few minutes' duration, depending on route and location. For residents in the vicinity, solar development in the SEZ would be visible on a daily basis.
- **Relative Size or Scale.** Buildings, and particularly the solar collector/reflector arrays within the SEZ, could be close enough that they would appear larger than existing structures in the current view. The SEZ would cover most of the portion of the horizontal field of view (140°), and facilities within the SEZ, viewed collectively, would be much larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create noticeable color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Defoliation in the fall of trees that screen views of the SEZ would increase visibility of solar facilities in the SEZ from the KOP and other locations on the trail where screening trees were present. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Light Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is east of the SEZ, glare would likely be observed from solar facilities in the SEZ. When glare occurs, it could be annoyingly bright for some viewers, and at the short distance involved, possibly bright enough to cause discomfort. Glare could increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night, given that there are very few existing lights visible on the ridge west of the KOP.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape, including the ridge line above the SEZ; however, the blocky forms of structures within the solar facilities would likely be visible above the solar arrays, and would contrast with the existing landscape. Solar facilities in SEZ would occupy much of the view to the northwest, and would dominate the view because of the vastness of the collector/reflector arrays as seen from the KOP.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but because of the very short distance between the KOP and the SEZ, would not affect visibility strongly on most days.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.16.5 Impact Summary for “Welcome to Colorful Colorado” State Line Sign KOP (Stateline KOP)

The “Welcome to Colorful Colorado” state line roadside sign is located less than 0.1 mi south of the southwest corner of the Antonito Southeast SEZ.

A BLM visual contrast rating was conducted for the “Welcome to Colorful Colorado” state line sign KOP. The overall contrast rating for the KOP is *Strong*, corresponding most closely to the VRM Class IV objective. The full impact discussion for the “Welcome to Colorful Colorado” state line sign KOP can be found in Section 3.19.

As seen from the Colorado welcome sign, solar facilities in the Antonito Southeast SEZ would be visually dominant elements across much of the field of view to the east of U.S. 285. For northbound travelers on the presumed trail route, solar facilities could stretch across much of the northeastern view, as the KOP is just south of the SEZ. The uniform colors and details of the complex but highly regular geometry of the solar arrays would be apparent, and would contrast strongly with the “organic” colors and textures of the surrounding existing vegetation. Glare events could occur as travelers approached the facility, especially from parabolic trough facilities, and could cause annoyingly bright reflections.

Travelers on presumed trail route in the vicinity of the KOP would vary in their sensitivity to solar development. For travelers on in the vicinity of the KOP, the solar facilities would appear as a large-scale industrial development in an otherwise natural/rural setting, although there is some development visible to the north, include industrial development. The solar facilities would contrast strongly with the generally natural-appearing surrounding landscape elements.

### **3.15.6 Impact Assessment**

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* BLM states that in the vicinity of the presumed route of the West Fork of the OST, most viewers would be local residents and workers, as the majority of activity in the area consists of farming and ranching. BLM does not actively promote the West Fork as a destination (Brown 2015a) but it is likely that a small proportion of viewers would be exploring the trail. It is likely that most human use of the area will be local residents tending their farms and ranches and travelling through the area by vehicle, foot, or potentially horseback. Those exploring the trail are likely seeking recreational, educational, and relaxation opportunities. Residents would see solar development anytime they look to the west. Persons exploring this segment of the OST would see solar development almost anytime while travelling north-south and intermittently while travelling local east-west oriented roads. Industrial development is inconsistent with the natural and rural visual character of the surrounding landscape, and the historic character of the trail, though there are a number of incompatible elements in view already. Some residents and trail explorers visitors might find the view of industrial-scale solar facilities unattractive.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be plainly visible to anyone in the vicinity of the KOPs and for several miles along the presumed trail route. Expected visual contrast would be strong, and glare events might occur. Where screening was absent, it would dominate the view, and could not be overlooked, especially if glare events were occurring.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Both local residents and trail users would be considered sensitive viewers, but for different reasons; residents would be sensitive to industrial development in sight of their homes, while trail users would more likely feel the solar development is incompatible with the historic character of the trail. Workers who were not residents would generally be less sensitive. According to BLM rough estimates there would be several thousand views of the SEZ per year from this area, though many would be repeat views by the same individuals.

As seen from the KOPs and nearby parts of the presumed trail route, solar development in the Los Mogotes East and Antonito Southeast SEZs would appear as multiple blocks or polygons of dark or light color (depending on technology type and lighting) with the blocky and angular forms of buildings visible projecting above it. Details of the arrays and accompanying structure could be visible on nearby facilities. The facilities would extend across a very large portion of the field of view. Considered as a whole, the solar facilities in the SEZs would be far larger elements in the landscape view than currently visible landscape elements. Bright reflections from the solar collector/reflector arrays and other facility components would likely be observed at times, including glare events which could potentially be annoyingly bright.

If solar development in the SEZs was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would be less visible than the taller, more complex, and more reflective components of parabolic trough facilities. If solar development in the SEZs included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, and increased potential for glare would make them more visible than PV facilities. Regardless of the technology employed, at 80% buildout, solar facilities would dominate views from a several mile stretch of the West Fork of the North Branch of the OST, and would introduce significant incompatible industrial elements into largely natural-appearing landscapes.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* There is some visibility from the presumed trail route of the West Fork of the North Branch of the OST to all three of the SEZs, so for anyone exploring the presumed trail route through the SLV, there is significant potential for cumulative visual impacts from sequential viewing of solar development in the SEZs. Particularly significant would be potential cumulative impacts from sequential viewing of solar development in the Antonito Southeast and Los Mogotes SEZs, as the two SEZs are relatively close together, and so close to the presumed trail route that they both create strong

visual contrasts. De Tilla Gulch is smaller in size and much farther from the presumed trail route than the other two SEZs, so its contribution to cumulative impacts would be small for the West Fork of the North Branch of the OST.

There are also some locations on the presumed trail route that may have simultaneous visibility of solar development in both the Los Mogotes East and Antonito Southeast SEZs, which would create cumulative visual impacts from simultaneous viewing of solar projects; however, as discussed elsewhere, screening by trees and structures, particularly near the Conejos River restricts visibility, but is not shown in the viewshed maps, which reflect topographic screening only. Field observation would be necessary to make a final determination, or, re-running the viewshed analysis with elevation data that included the heights of vegetation and structures, or using another method to account for screening.

### **3.15.7 Regional Compensatory Mitigation Recommendation**

The West Fork of the North Branch of the OST is currently not a major destination for tourists. It currently is undesignated, but is under study, and might be designated in the future, which would likely increase its sensitivity as a historic resource, in addition to drawing larger numbers of more sensitive viewers. There are a number of obvious cultural modifications visible from the presumed trail route that have already compromised the historic look and feel of the landscape. The presumed trail route would be subject to strong visual contrasts from solar development in Antonito Southeast and Los Mogotes East SEZs, and likely subjected to weak visual contrasts from solar development in the De Tilla Gulch SEZ. Trail users could also be subjected to cumulative visual impacts from sequential views of solar development in the SEZs, particularly in Los Mogotes East and Antonito Southeast SEZ. Judged solely on current use, it could be argued that there are too few sensitive viewers to classify the impacts as major impacts warranting regional compensatory mitigation, but assuming that designation of the trail would increase the number of sensitive viewers substantially, regional compensatory mitigation is recommended as compensation for potential visual impacts that might occur to the West Fork of the North Branch of the OST.

### **3.17 San Luis Hills WSA (Representative KOPs: Piñon Hills Highpoint, John James Canyon Trailhead)**

#### **3.17.1 VSA Description**

*VSA Type:* Specially Designated Area

*Potentially Impacting SEZs:* Los Mogotes East SEZ, Antonito Southeast SEZ

*Representative KOPs:* Piñon Hills Highpoint, John James Canyon Trailhead

*Distance from SEZ to Affected Area within VSA:* The distance from the closest point in the San Luis Hills WSA to the closest visible point in the Los Mogotes SEZ is approximately 8.9 mi. The distance from the closest point in the San Luis Hills WSA to the farthest visible point in the Los Mogotes SEZ is approximately 11.3 mi. See Figure 3.12-1.

The distance from the closest point in the San Luis Hills WSA to the closest visible point in the Antonito Southeast SEZ is approximately 6.2 mi. The distance from the closest point in the San Luis Hills WSA to the farthest visible point in the Antonito Southeast SEZ is approximately 11.0 mi. See Figure 3.12-2.

*Affected Area within the VSA:* The total area of the San Luis Hills WSA is 10,889 acres. The Los Mogotes East SEZ is located on an east-facing slope, west of the San Luis Hills WSA. Solar facilities within the Los Mogotes East SEZ would be visible from 3000 acres, or 28% of the WSA. See Figure 3.12-1.

The Antonito Southeast SEZ is located on a flat plain southwest of the San Luis Hills WSA. Photovoltaic facilities within the Antonito Southeast SEZ would be visible from 4,615 acres, or 42% of the WSA. Parabolic trough facilities in the SEZ would be visible from an additional 352 acres, or 46% of the WSA. See Figure 3.12-2.

*Estimated Annual Visitation/Usage in VSA:* Visitor estimates are not available; however, BLM states that the SLV Recreation Planner estimates that annual visitation to the WSA is less than 12 visitors per year (Brown 2015a).

*Types of Activities within the Affected Area:* Activities in the WSA include riding horses, hiking, sightseeing, photography, hunting, wildlife watching, rock climbing and rock hounding (Brown 2015a).

*Estimated proportion of visitors conducting each major activity type:* The majority of visitors to the San Luis Hills WSA are participating in the relaxation and recreation activities listed above. Percentages of visitor use are not available; however, BLM states that visitors would include hikers, hunters and local ranchers (Brown 2015a).

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* WSAs identify relatively undeveloped areas with special ecological, geological, educational, historical, scientific, or scenic values. The San Luis Hills WSA was designated in part for its scenic values and opportunities for solitude (BLM 2012). BLM has stated that visitors to the WSA may be seeking wilderness experiences and thus could be sensitive to views of industrial development (Brown 2015a).

### **3.17.2 KOP Description**

The San Luis Hills WSA is wholly contained within the San Luis Hills ACEC, and two of the three representative KOPs for the ACEC (the Piñon Hills Highpoint KOP and the John James Canyon Trailhead KOP) are also within the WSA. The complete KOP description and contrast discussion for these KOPs is available in the San Luis Hills ACEC impact discussion. See Sections 3.12.5-3.12.7 for discussion of the Piñon Hills Highpoint KOP, and Sections 3.12.8-3.12.10 for discussion of the John James Canyon Trailhead KOP.

### **3.17.3 Impact Assessment**

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The San Luis Hills WSA was designated in part for its scenic values and opportunities for solitude (BLM 2012). BLM has stated that visitors to the WSA may be seeking wilderness experiences and thus could be sensitive to views of industrial development (Brown 2015a). Industrial development is inconsistent with the natural and rural visual character of the surrounding landscape, and is inconsistent with the wilderness experience. Some WSA visitors might find the view of industrial-scale solar facilities in the Los Mogotes East and Antonito Southeast SEZs unattractive.

*Summary of level of visual exposure based on the representative VRM class objective:* Similarly to the San Luis Hills ACEC, solar development in the Los Mogotes East and Antonito Southeast SEZs could not be missed by casual observers in affected parts of the WSA. Under normal viewing conditions, it would be noticeable to casual observers, and where both SEZs are visible, could begin to dominate the view. If glare events occurred, contrast levels could be high enough that solar facilities in the SEZs would attract and hold visual attention, and have sufficient contrast and apparent size to dominate the view.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Similarly to the San Luis Hills ACEC, solar facilities in one or both of the SEZs would be plainly visible to visitors in about half of the WSA, mostly the western portions, especially at higher elevations. Visitors to the interior of the WSA would not be exposed to solar

development in the SEZs because of topographic screening, and those entering the canyon would have the solar developments in the Antonito Southeast SEZ behind them, limiting view duration. Views would be longer duration for person leaving the WSA through John James Canyon, as they would be facing the SEZ. Most users of the WSA would be considered to be sensitive viewers; however, visitation is thought to be very low (Brown 2015a), less than 12 visits/year. There is a variety of other development visible within the San Luis Valley, and some visual characteristics of solar facilities would be compatible with other development in the valley; however, the high reflectivity of the collector/reflector arrays and very large size of the facilities and the SEZs as a whole would make them visually prominent.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them generally less noticeable than parabolic trough facilities, but because of the size of the SEZs, they would still be noticeable as large blocks of dark or light color of an unnatural evenness, and likely with obviously artificial geometry. When glare events occurred and caused bright reflections strong visual contrast would sometimes be observed; however, glare events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they could add very little light pollution, but would still be visible.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Solar facilities in both the Los Mogotes East and Antonito Southeast SEZs would be visible from some locations at higher elevations in the northwestern portions of the WSA. From these locations, most or all of one or both SEZs would be visible, and thus the cumulative impacts from simultaneous viewing of both SEZs would be large in these areas. In other locations, as ACEC visitors moved, facilities in first one, then the other SEZ would be visible, so there would also be cumulative impacts from sequential viewing of the SEZs.

#### **3.17.4 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Los Mogotes East and Antonito Southeast SEZs would be noticeable to casual observers in large portions of the San Luis Hills WSA, and could cause moderate visual contrasts depending on the location within the WSA. At least some viewers would be considered sensitive to industrial development, but a variety of cultural modifications are seen throughout the San Luis Valley, so the existing views are generally not natural-appearing. Cumulative visual impacts from simultaneous and sequential viewing of solar facilities within the SEZs would be large. These factors would generally suggest regional compensatory mitigation is warranted; however, as for the San Luis Hills ACEC, the current

estimated visitation to the WSA is so low that the total visual impact cannot be considered significant. In addition, view duration is generally not likely to be long, except for a very few individuals. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the San Luis Hills WSA as a result of solar development in the Los Mogotes East and Antonito Southeast SEZs. However, it should be noted that visual impacts to the WSA viewshed from solar development in the SEZ could potentially negatively affect the wilderness experience of WSA visitors.

### **3.18 Los Cominos Antiguos Scenic and Historic Byway (Representative KOPs: Manassa, Romeo, Antonito/Los Caminos)**

#### **3.18.1 VSA Description**

**VSA Type:** Specially Designated Area

**Potentially Impacting SEZ:** Los Mogotes East SEZ, Antonito Southeast SEZ

**Distance from SEZ to Affected Area within VSA:** The Los Antiguos Caminos Scenic and Historic Byway (the Byway) passes within approximately 2.6 mi of the southeast corner of the Los Mogotes East SEZ, at the point of closest approach. Within the 25-mi viewshed of the SEZ, the farthest point on the Byway is approximately 24 mi from the northeast corner of the SEZ, however, trees and structures effectively screen the SEZ from view for large portions of the route.

The Byway passes within 1.5 mi of the northwest corner of the Antonito Southeast SEZ. Within the 25 mi viewshed of the SEZ, the farthest point on the Byway is 10.7 mi from the northeast boundary of the SEZ, west of Manassa; however, visibility from the Byway at that point would be limited to approximately 0.5 mi, and the angle of view to the SEZ so low that contrasts would be weak. Farther west, trees and structures effectively screen the Antonito Southeast SEZ from view of the Byway until the community of Antonito.

**Affected Area within the VSA:** A total of 27 mi of the Byway are located within the 25-mi viewshed of the Los Mogotes East SEZ, in two segments:

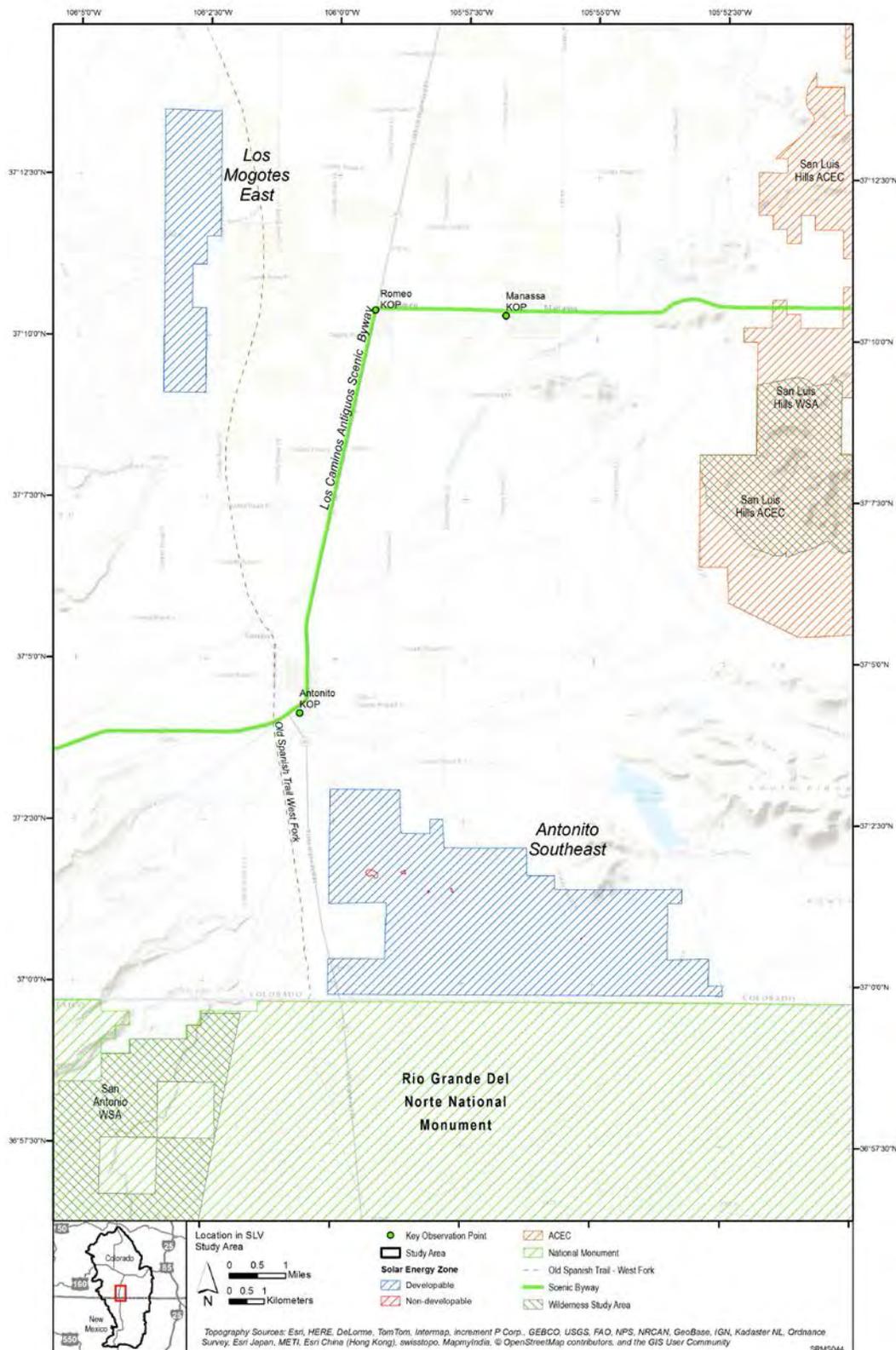
- The main segment, running from approximately 10 mi west of Manassa, through Romeo and Antonito to approximately 4.6 mi west of Antonito; and
- A much smaller segment running from the Byway's northern terminus at Alamosa north approximately 4.6 mi. See Figure 3.18-1. Trees and structures effectively screen the SEZ from view from this segment of the Byway; however, if there were visibility of the SEZ from this part of the Byway, the contrasts would be weak.

**Estimated Annual Visitation/Usage in VSA:** CDOT estimates that 2,200 vehicles pass through Romeo each day on CO-142; 620 vehicles pass through Manassa each day on CO-142; and 5,200 vehicles pass through Antonito each day on US-285/CO-17. An additional 1,500 vehicles travel on CR-17 near the town of Mogote, CO. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 5.3 million, many of which would be repeated views for commuters and visitors to the Byway. Persons using these roads would be a mixture of locals, tourists and truckers.

**Types of Activities within the Affected Area:** Driving, biking, sightseeing, photography, wildlife viewing, and hiking.

**Estimated proportion of visitors conducting each major activity type:** The majority of viewers would be drivers or passengers in vehicles passing through the area. Much of this traffic is likely to be local residents going to and from work, school, shopping, etc. or travelling the Los Caminos Antiguos Scenic and Historic Byway. In a survey of Byway users conducted in 1998 covering three summer months, the Los Caminos Antiguos Scenic and Historic Byway Partnership Plan identified general sightseeing (80% ) as the main activity associated with the byway, followed by photography (44%), wildlife viewing (38%), and hiking (35%)(LCASHB 1999).

**Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:** According to the Los Caminos Antiguos Scenic and Historic Byway Partnership Plan, the purpose of the Los Antiguos Caminos Historic and Scenic Byway is to “Interpret, facilitate community development, and market the products of the cultural and historic traditions, natural resources, and diverse communities (LCASB 1999).” The plan goes on to state (pg. 27) that the Byway will be a vehicle for sustainable community economic development, and that the Byway Partners will “work to protect the open spaces and viewshed integrity along the byway.”



**Figure 3.18-1 Los Caminos Antiguos Scenic and Historic Byway and the Los Mogotes and Antonito Southeast SEZs**

### **3.18.2 Summary of Impacts to KOPs**

#### **3.18.2.1 Introduction**

Three representative KOPs (Manassa, Romeo, Antonito/Los Caminos) were used to analyze impacts to the Byway. The Manassa and Romeo KOPs were used to analyze impacts from solar development in the Los Mogotes East SEZ. The Antonito/Los Caminos KOP was used to analyze impacts from solar development in the Antonito Southeast SEZ. The basis for deciding if regional compensatory mitigation for visual impacts to the Byway is warranted would consider impacts to the representative KOPs and other points on the Byway from which solar facilities in the SEZ would be visible, and the cumulative impacts of sequential or simultaneous views of solar facilities in the SEZs. Impacts to the Romeo KOP are discussed in detail in Section 3.10. Impacts to the Manassa KOP are discussed in detail in Section 3.11. Impacts to the Antonito/Los Caminos KOP are discussed in detail in Section 3.14. Impacts to the Byway as a whole are discussed in the draft Solar PEIS (BLM 2010), and are summarized in Section 3.18.2.5 below. Cumulative impacts from solar energy development in the SEZs only, are discussed in Section 3.18.4 below.

#### **3.18.2.2 Summary of Impacts to the Manassa Representative KOP**

Manassa is located 5 mi east of the Los Mogotes SEZ, on CR 142. The SEZ is located on an east-facing slope, due west of Manassa. The SEZ is within the BLM background zone of 5-15 mi.

A BLM visual contrast rating was conducted for the Manassa KOP on Aug. 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The overall contrast rating for the Manassa KOP is *Weak*, corresponding most closely to the VRM Class II objective.

Travelers on the Byway in the vicinity of the Manassa would include residents, tourists, and other visitors to the SLV who would vary widely in their sensitivity to the visual contrast of solar facilities within the SEZ, with tourists and residents likely to be more sensitive than others. For persons travelling west on the Byway approaching Manassa, the view of the SEZ is somewhat restricted to the highway right-of-way as there are structures and vegetation on either side of the highway which partially screen the view. The angle of view to the SEZ is very low, and while in the absence of screening elements solar facilities would be visible as a very narrow band at the foot of a distant, low mountain ridge, foreground vegetation and structures would effectively screen most of the SEZ from view. Because of the distance, the low angle of view, and screening, it is very unlikely that persons not familiar with the nature of the SEZ and its location would recognize it as consisting of solar facilities.

For westbound travelers on the Byway, visibility of solar facilities in the SEZ would improve somewhat as they approached Romeo, and contrasts would gradually rise to moderate; however, as the distance between Manassa and Romeo is only 2 mi, the SEZ would only be in view for a few minutes between Manassa and Romeo.

Eastbound travelers on the Byway in the vicinity of Manassa would have the SEZ behind them, and would not be expected to look in that direction, but if they did, the visual contrast from solar facilities in the SEZ would be weak.

### **3.18.2.3 Summary of Impacts to the Romeo Representative KOP**

Romeo is located 3 mi east of the Los Mogotes SEZ, on the east side of U.S. 285 at the intersection of U.S. 285 and CR 142. The SEZ is located on an east-facing slope, due west of Romeo. Most of the SEZ is within the BLM foreground-middleground zone of 3-5 mi.

A BLM visual contrast rating was conducted for the Romeo KOP on Aug. 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The overall contrast rating for the Romeo KOP is *Moderate*, corresponding most closely to the VRM Class III objective.

From the Byway near Romeo, solar facilities within the SEZ would appear very large with respect to other objects visible in the landscape, and would occupy a large part of the field of view. The details of the complex but highly regular geometry of the solar array would be apparent, and would contrast strongly with the “organic” appearance of the surrounding existing vegetation. The black PV panels or silver surfaces of parabolic trough mirrors would contrast strongly with the grays, greens, tans, and other hues of the existing vegetation. As westbound travelers approached and passed the SEZ when they turn south on U.S. 285, the angles of view and lighting on solar facilities would change, and dramatic changes in the appearance of the facilities could occur, adding to the overall contrast created by the facilities. Glare events could occur as they approached the facility, especially from parabolic trough facilities, and could cause annoyingly bright reflections. Lighting associated with solar facilities within the SEZ would be visible at night, and for parabolic trough facilities, could be prominent, even with good mitigation. For these travelers, contrasts could reach moderate levels, but the vast majority of Byway users would be exposed to the contrast for only a few minutes as they approached Romeo from Manassa, and at least parts of the SEZ would be screened by trees and structures in and around Romeo.

Northbound travelers on the Byway would have the SEZ on their left as they approached Romeo, and then they would turn east toward Manassa, and the SEZ would be behind them. Given that the SEZ would be on the driver’s side, and in view for only a few minutes in the vicinity of Romeo, visual contrasts would likely be weak.

#### **3.18.2.4 Summary of Impacts to the Antonito/Los Caminos Representative KOP**

Antonito is located 1.6 mi north of the northwest corner of the Antonito Southeast SEZ. The Byway passes within 1.5 mi of the SEZ just south of Antonito, near the C&T RR depot.

A BLM visual contrast rating was conducted for the Antonito/Los Caminos KOP on Aug. 11, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The overall contrast rating for the Antonito/Los Caminos KOP is *Weak*, corresponding most closely to the VRM Class II objective.

In most parts of Antonito, including the Byway in this area, the SEZ is largely screened by structures or vegetation, including trees lining the Rio San Antonio. The angle of view from the KOP to the SEZ is very low, and where screening was absent, solar facilities would be visible as a very narrow band at the foot of a distant, low mountain ridge. For travelers on the Byway, in either direction, solar facilities in the SEZ would be seen very briefly in gaps through the screening vegetation.

Northbound travelers on the Byway would have the SEZ on their right as they approached Antonito, but views of the SEZ would largely be screened, and then they would turn north toward Romeo, and the SEZ would be behind them.

Southbound travelers on the Byway would drive toward the SEZ as they approached Antonito, but buildings and trees in Antonito would screen views toward the SEZ almost completely, and the trees along the Rio San Antonio farther south would provide further screening.

#### **3.18.3 Summary of Impacts to Other Locations on the Byway**

Between Romeo and Antonito, southbound travelers on the Byway would have some clear views of the Los Mogotes SEZ on their right, but the angle of view would be low, and vegetation and structures would screen part of the SEZ from view. Where the view was clear, contrasts under normal viewing conditions could be moderate. In about two minutes at highway speed, they would be past the SEZ, and therefore much less likely to look at it, but if they did, contrast levels would decrease as they drove south.

Northbound travelers on this stretch of the Byway would not see solar facilities in the Los Mogotes East SEZ until they had passed through the trees that line the course of the Conejos River approximately 1.5 mi north of Antonito. After passing through trees, travelers on the Byway would have some clear and some partially screened views of solar facilities in the Los Mogotes SEZ. Contrast could rise to moderate levels in this stretch of the Byway, until reaching Romeo to turn east on the Byway after about 5 minutes travel time, however, significant portions of the SEZ would be screened from view in many places by trees and house along the highway.

Eastbound Byway travelers approaching Antonito from the west could potentially have views of solar facilities in the Antonito Southeast SEZ, however, trees along the Conejos River would screen views of the SEZ, and once past the river, trees along the Rio San Antonio would provide at least partial screening of views into the SEZ. Where screening failed to completely conceal solar facilities in the SEZ, they would be partially screened, and would likely create only weak contrasts for the five minutes it would take to reach Antonito, where they would turn north, away from the SEZ.

#### **3.18.4 Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs**

Travelers on the Byway would be subject to cumulative visual impacts from sequential views of solar facilities if they drove on the Byway past both the Los Mogotes East and Antonito Southeast SEZs. Because solar facilities within the Antonito Southeast SEZ would be seen only briefly (if at all) and because the expected visual contrast levels would be weak, cumulative effects would be minor.

#### **3.18.5 Regional Compensatory Mitigation Recommendation**

Three representative KOPs were used to analyze impacts to the Los Caminos Antiguos Scenic and Historic Byway, and these analyses were supplemented by the analysis of visual contrasts for the remainder of the Byway. These analyses show that users of the Byway could be subjected to moderate visual contrasts as they approached and passed the Los Mogotes East SEZ, where there are some short stretches of the Byway with unobstructed views of the SEZ. Other development is visible in the area, especially around Romeo, Manassa, and Antonito; however, the overall visual impression of the area is a rural/agricultural or small town setting with widely scattered farm and ranch buildings, with a mostly natural appearing backdrop of hills or mountains. The presence of one or more utility-scale solar facilities in a location only a short distance from the Byway will create a moderate source of visual contrast visible from the Byway, and the presence of industrial facilities in the rural visual setting is inconsistent with the area's landscape character and the historic purpose of the Byway. Preservation of open space and the Byway's viewsheds are desired to protect the Byway experience.

A relatively large number of people on the Byway would be exposed to the visual contrasts from solar facilities in the SEZ. Persons driving on the Byway would vary from low to high viewer sensitivity. Many would be commuters or others not seeking scenic/historic views/experiences and would likely have low sensitivity, while other drivers would have chosen to travel the Byway expressly because of the opportunities for scenic/historic views and experiences, and would likely have high sensitivity.

Views of the both the Los Mogotes and the Antonito Southeast SEZ are fully or partially screened in many places. Where there would be clear views, the exposure would be at most a few minutes, and generally the views would be off to the sides of the vehicles and not in the

direction of travel, thus reducing both impact and duration. The overall impact of seeing solar facilities in the SEZs on the Byway visual experience is likely to be minor. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the Los Caminos Antiguos Scenic and Historic Byway as a result of solar development in the Los Mogotes East and Antonito Southeast SEZs.

### **3.19 “Welcome to Colorful Colorado” State Line Sign (Stateline KOP) (Also Representative KOP for U.S. 285 and West Fork, North Branch of the Old Spanish Trail)**

#### **3.19.1 VSA Description**

*VSA Type:* Point of Interest

*Potentially Impacting SEZ:* Antonito Southeast SEZ, Los Mogotes SEZ

*Distance from SEZ to Affected Area within VSA:* The distance from the “Welcome to Colorful Colorado” state line roadside sign to the closest visible point in the Antonito Southeast SEZ is less than 0.1 mi. The distance from the “Welcome to Colorado” sign to the farthest visible point in the SEZ is approximately 5.4 mi. See Figure 3.19-1.

The distance from the “Welcome to Colorful Colorado” state line roadside sign to the closest visible point in the Los Mogotes East SEZ is approximately 11.0 mi. The distance from the “Welcome to Colorado” sign to the farthest visible point in the SEZ is approximately 16.1 mi. See Figure 3.19-2.

*Affected Area within the VSA:* The “Welcome to Colorful Colorado” state line sign is a large roadside sign on the eastern side of U.S-285 at the Colorado-New Mexico border. It is essentially a roadside turnout.

*Estimated Annual Visitation/Usage in VSA:* BLM states that many people stop at the CO-NM state line to take pictures in front of the Colorado welcome sign (Brown 2015a). CDOT indicates that up to 1,000 vehicles per day pass this KOP. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 565,000 views, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers. The number of vehicles per day stopping at the sign is unknown, but likely multiple vehicles stop each day when the weather is favorable.

*Types of Activities within the Affected Area:* Viewing scenery and photography.

*Estimated proportion of visitors conducting each major activity type:* The proportion of viewers engaged in the two major activities is unknown, but many take photographs.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* N/A

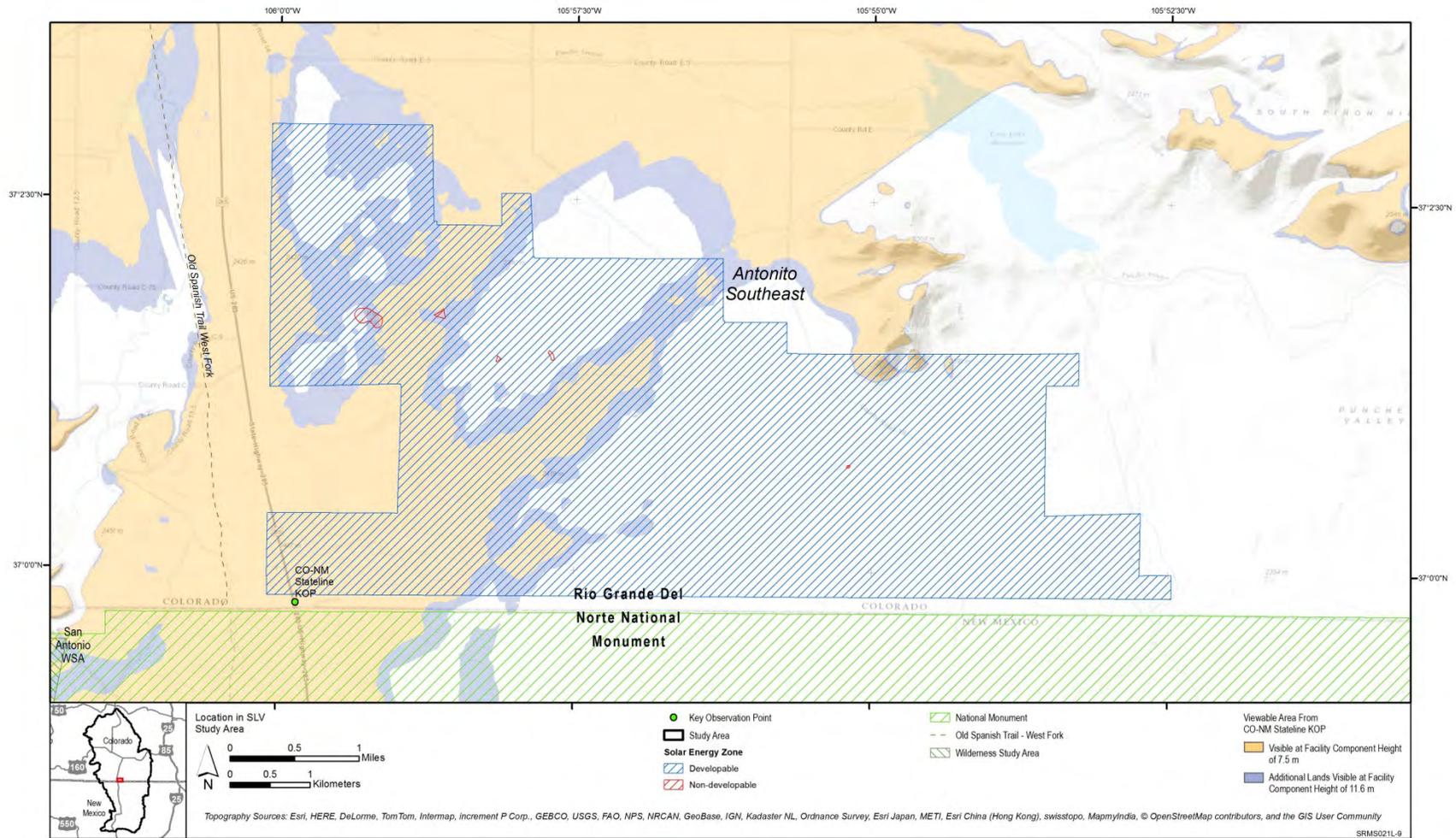
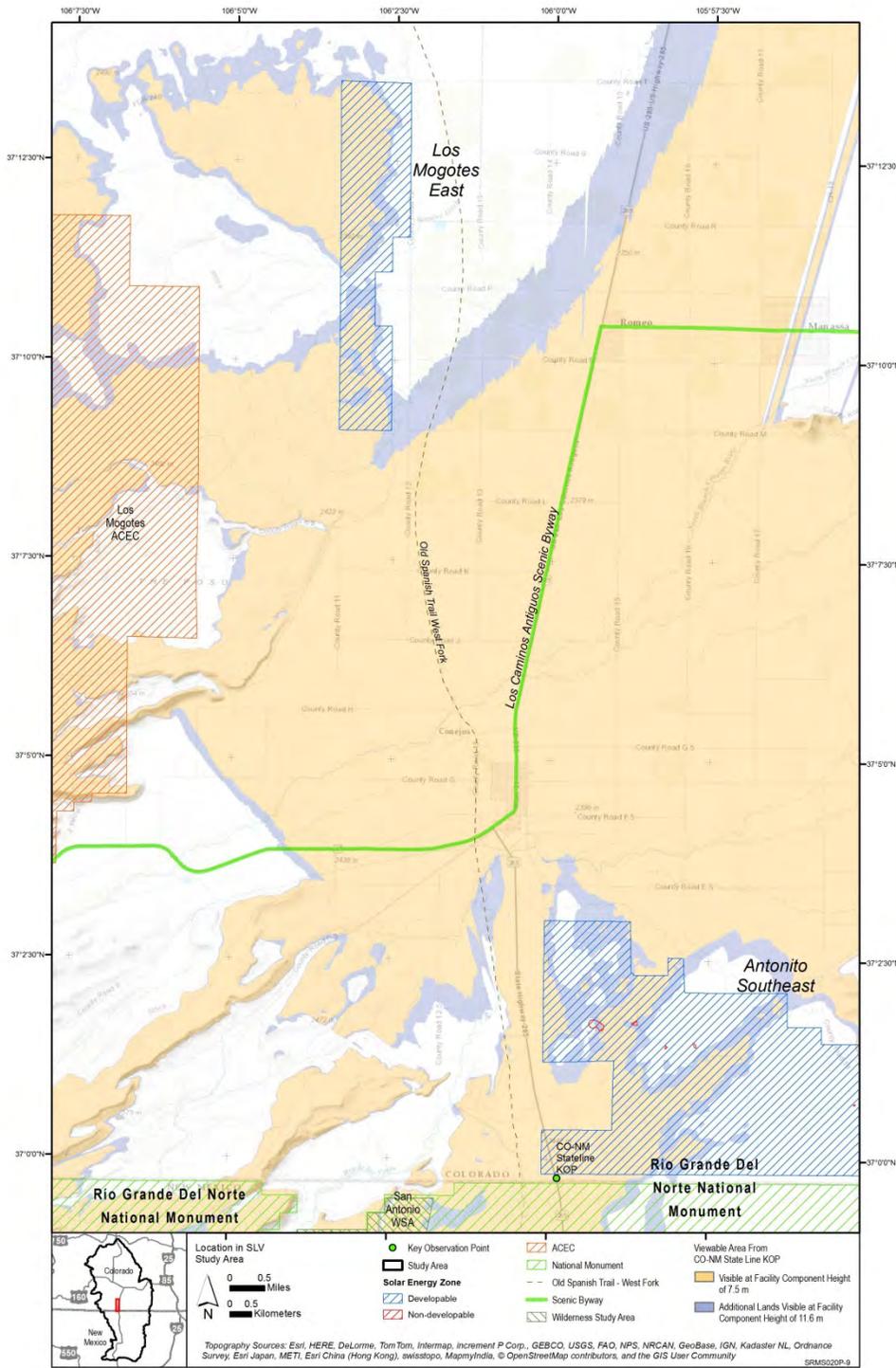


Figure 3.19-1: Viewshed from the "Welcome to Colorful Colorado" State Line Sign KOP, including Antonito Southeast SEZ



**Figure 3.19-2: Viewshed from the Welcome to Colorful Colorado” State Line Sign KOP, including Los Mogotes East SEZ**

### 3.19.2 KOP Description

*KOP Name:* Stateline

*KOP Location:* The Stateline KOP is located at the “Welcome to Colorful Colorado” sign on the eastern side of U.S-285 in New Mexico just north of the Colorado-New Mexico border. See Figure 3.19-1.

*Critical or Representative KOP:* Critical, representative

*Critical Nature of Affected View (if applicable):* A large number of people driving on U.S. 285 stop here to view the landscape and to photograph the sign and its scenic backdrop.

*Rationale for Selecting KOP:* This KOP was selected because large numbers of viewers stop here for visually-related activities. The KOP is also within sight of the presumed route of the West Branch of the North Fork of the Old Spanish Trail.

*KOP Access Modes:* Primarily automobile, truck, and bicycle.

### 3.19.3 Visual Context

*General Description:* Panoramic view of a vast expanse of treeless open grasslands, with scattered ranches and agricultural areas and structures, also some industrial development at far left. The Sangre de Cristo Mountains and San Luis Hills can be seen in the far distance. See Figure 3.19-3.

*Cultural Modifications Visible within the KOP Viewshed:* Homes, agricultural fields, roads, farm buildings, small town development, grazing land, highways, distribution lines, vehicles, fences, communication towers, road signs, industrial development.

*Direction of View toward SEZ:* North-northeast

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Antonito Southeast SEZ: Approximately 150°. Los Mogotes East SEZ: Approximately 8°. See Figure 3.19-4.

*Acreage and Percentage of SEZ within KOP Viewshed:* There is good visibility of the southwest portion of the Antonito Southeast SEZ from Stateline KOP. The majority of the eastern portion of SEZ is screened by topography. As seen from the KOP, PV facilities would be visible on approximately 2,167 ac (22%) of the SEZ. Parabolic trough facilities could potentially be visible on 3,789 ac (39%) within the SEZ. As seen from the KOP, PV facilities would be visible on approximately 1,414 ac (53%) of the Los Mogotes East SEZ. Parabolic trough facilities could potentially be visible on 2001 ac (76%) within the Los Mogotes East SEZ.

*Orientation of the solar energy development within the field of view:* The Antonito Southeast SEZ is in the approximate center of view and extends nearly 90° to the right. The Los Mogotes East SEZ is at the far left in the view.



**Figure 3.19-3 Photograph of Existing Landscape from Stateline KOP Looking toward Antonito Southeast SEZ**



**Figure 3.19-4 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from Stateline KOP**

### 3.19.4 Visual Contrast Rating

A BLM visual contrast rating was conducted for the San Antonio Mountain WVA KOP on August 12, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.19-1.

**Table 3.19-1 Visual Contrast Rating for Stateline KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form		√				√			√			
	Line			√			√			√			
	Color	√				√				√			
	Texture			√			√					√	

Primarily because of the very close proximity of solar development in the Antonito Southeast SEZ, the overall contrast rating for the Stateline KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast demands attention, will not be overlooked, and is dominant in the landscape.*” This corresponds most closely to the VRM Class IV objective. The VRM Class IV objective from Manual 8431 is “*...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.*”

Overall contrast was judged to be strong because solar facilities in the SEZ would occupy the immediate foreground, and would occupy an area about 150° wide on the horizon, so that

relatively large appearing solar facility components would stretch across most of the view. Viewed from this close distance, regardless of the technology type, solar facilities would dominate the view, both at the “Welcome to Colorful Colorado” sign but also the nearby U.S. 285 roadway and the presumed location of the West Fork of the North Branch of the Old Spanish Trail.

A contrast rating was not conducted from the Stateline KOP for the Los Mogotes East SEZ because field inspection showed that the SEZ would be screened from view by vegetation and structures between the KOP and the distant SEZ; however, close inspection of the viewshed analysis and topography via computer suggests that the tops of facilities might be visible over the tops of trees along the Conejos River, which are the primary non-topographic screening element. If the facilities were visible, however, given the screening, the long distance to the Los Mogotes East SEZ (11.0-16.1 mi), and the narrow horizontal and vertical angles of view, the contrast would be weak, and the facilities very unlikely to be noticed by casual observers.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within a small area of the Antonito Southeast SEZ would be visible at a distance of between 0.1-5.4 mi from the “Welcome to Colorful Colorado” sign at the Stateline KOP. This distance is almost entirely in the BLM foreground-middleground distance zone, so that details of nearby structures would be clearly visible, and solar collector/reflectors and other project components would generally be seen as distinct individual elements.
- **Angle of Observation.** Because of the very short distance to the Antonito Southeast SEZ, solar facilities in the SEZ would stretch approximately 150° across the view.
- **Length of Time the Project Is In View.** Solar facilities in the Antonito Southeast SEZ would be obvious to anyone looking north or east from the “Welcome to Colorful Colorado” sign or driving past on U.S. 285. The length of time the project will be in view would depend on how long an individual stays in the area. Solar facilities in the SEZ would be visible for 4-6 minutes while driving on U.S. 285 to this location. Most visitors to the “Welcome to Colorful Colorado” sign stay only long enough to take photos for a few minutes and look at the landscape briefly.
- **Relative Size or Scale.** Because of the close proximity to the SEZ, solar facilities within the SEZ would likely appear substantially larger than any other landscape elements in the view, and would likely dominate views from the KOP.

- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Because of the open nature of the landscape between the “Welcome to Colorful Colorado” sign and the SEZ, defoliation of trees in the fall would not change views of solar development in the SEZ substantially. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase; this could increase facility substantially because the plumes would be moving, generally vertical elements in a still and strongly horizontal landscape.
- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is south-southwest of the SEZ, incidence of glare from the collector array is possible, and at the very short distance to the SEZ, could be annoyingly bright at times or even cause visual discomfort, and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Travelers on U.S. 285 might observe glare spots “traveling along” with their vehicle as they passed the solar collector/reflector arrays. Glare might also be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Given the lack of lighting in the existing landscape both in and south of the SEZ combined with the close proximity of the SEZ, lighting from solar facilities in the SEZ would likely attract visual attention.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar developments within the SEZ would be observed from a low vertical angle of view but would be so close that while the low forms and generally

horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape, the rectilinear forms, repeating textures created by large numbers of regularly spaced collectors/reflectors, and the very large apparent size of the facilities will overwhelm other landscape elements, including the San Luis Hills and other mountains that are otherwise prominent in the view.

- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but would not likely affect short distance views.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.19.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Many people stop at the “Welcome to Colorful Colorado” state line roadside sign to take pictures in front of the sign, including its scenic backdrop, which is largely natural-appearing. Solar facilities within the Antonito Southeast SEZ would be visible from the state line roadside sign. Industrial development is inconsistent with the mostly natural appearing visual character of the surrounding landscape. Some viewers might find the view of industrial-scale solar facilities unattractive and inappropriate, that they make a poor first impression for visitors to Colorado and the San Luis Valley, and are not a good backdrop for photographs, especially if they dominate the view because of the facility size and/or the high reflectivity of facility components.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ would be plainly visible to visitors to the “Welcome to Colorful Colorado” state line roadside sign, and would likely be the dominant visual element in the view from the sign, regardless of the solar technologies employed.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Visitors to the “Welcome to Colorful Colorado” roadside sign are not likely to be inherently sensitive to the sight of solar development; however, because of their desire to take photos of the sign with a scenic backdrop, and because this is their first visual impression of Colorado and the San Luis Valley, they may be sensitive to solar development as an immediate and dominant element of the view. Most would likely stop for a short period of time, so that view duration would be a few minutes, in addition to the time the facilities would be visible while driving.

As seen from the Colorado welcome sign, solar facilities in the SEZ would be visually dominant elements across much of the field of view, and obviously appear as a large-scale industrial development in an otherwise natural/rural setting. They would contrast strongly with the surrounding landscape elements, and could not be ignored.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Because the KOP does not have an unobstructed view of the De Tilla Gulch SEZ, which is too far to cause visual impacts in any event, no cumulative visual impacts from solar development within that SEZ is anticipated. The Los Mogotes East SEZ is technically visible, but largely screened by other landscape elements, and not likely to be noticed by casual observers. It is not expected to cause cumulative visual impacts through simultaneous viewing of multiple facilities, but if visitors to the Colorado welcome sign drive up U.S. 285 past the Los Mogotes SEZ, they could be subject to cumulative impacts through sequential viewing of multiple facilities, which could be substantial in this case because both SEZs are very plainly visible from U.S. 285.

### **3.19.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Antonito Southeast SEZ would dominate views from the “Welcome to Colorful Colorado” state line roadside sign. The Colorado welcome sign is a popular tourist destination for brief stops, and also is sensitive because it is where a large number of visitors form their first visual impression of both Colorado and the SLV. It is also a familiar view for thousands of locals who enter the SLV on U.S. 285, a major thoroughfare through the SLV. The whole nature of the visual experience of the “Welcome to Colorful Colorado” landscape will be changed by major visual impacts from solar development in the SEZ less than 0.1 mi away, including the possibility of strong glare for visitors and for those driving on U.S. 285 and traveling on the presumed route of the West Fork of the North Branch of the Old Spanish Trail. As a result, regional compensatory mitigation is recommended as compensation for potential visual impacts on the “Welcome to Colorful Colorado” state line roadside sign, U.S. 285, and the West Fork of the North Branch of the Old Spanish Trail as a result of solar development in the Antonito Southeast SEZ. For more information on impacts to U.S. 285, see Section 3.21. For more information on impacts to the West Fork of the North Branch of the Old Spanish Trail, see Section 3.16.

### **3.20 San Antonio Mountain Wildlife Viewing Area (Also Representative KOP for U.S. 285 and Rio Grande Del Norte National Monument)**

#### **3.20.1 VSA Description**

*VSA Type:* Point of Interest

*Potentially Impacting SEZ:* Antonito Southeast SEZ

*Distance from SEZ to Affected Area within VSA:* The distance from the San Antonio Mountain Wildlife Viewing Area (WVA) to the closest visible point in the Antonito Southeast SEZ is approximately 9.4 mi. The distance from the WVA to the farthest visible point in the SEZ is approximately 11.9 mi. See Figure 3.20-1.

*Affected Area within the VSA:* The San Antonio Mountain WVA is a designated and signed wildlife viewing area on the eastern side of U.S-285 in New Mexico, approximately 9.4 mi south of the Colorado-New Mexico border. It is essentially a roadside turnout.

*Estimated Annual Visitation/Usage in VSA:* This is a designated WVA. The majority of individuals who stop here would be a mix of locals and tourists watching and photographing elk, deer, antelope, raptors and other wildlife, generally in a wide expanse of grassland east of U.S. 285. The number of users of the WVA is unknown, but CDOT indicates that up to 1,000 vehicles per day pass this KOP<sup>3</sup>. At an average of 1.55 persons/vehicle, total annual views from vehicles are approximately 565,000 views, many of which would be repeated views for commuters. Persons using these roads would be a mixture of locals, tourists and truckers.

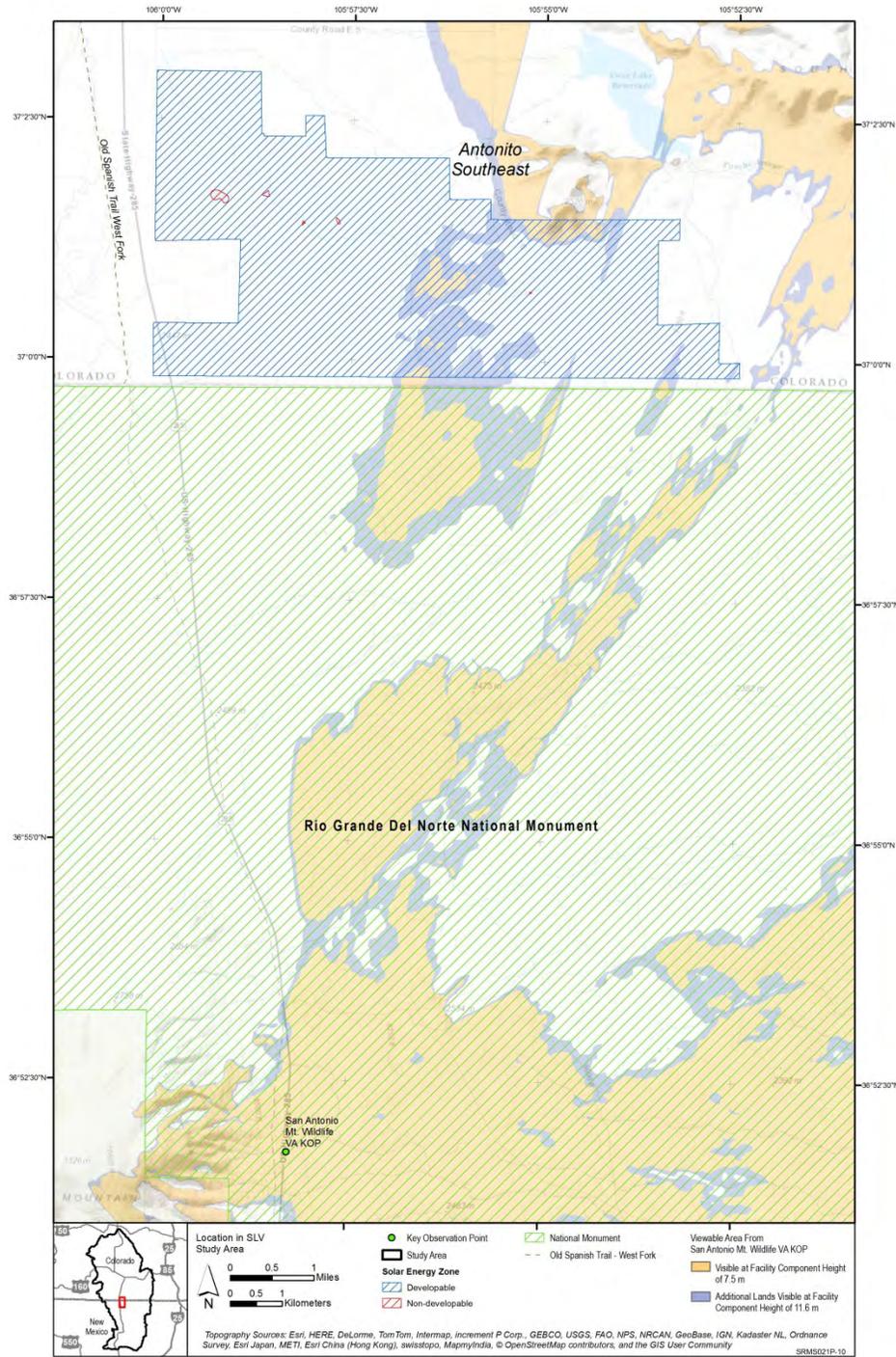
*Types of Activities within the Affected Area:* Wildlife viewing and photography.

*Estimated proportion of visitors conducting each major activity type:* The proportion of viewers engaged in the two major activities is unknown, but it can be assumed that more people are viewing wildlife than are taking photographs.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* N/A

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<sup>3</sup> Based on CDOT traffic counts at state line, as this KOP is in New Mexico, with little opportunity to leave the highway between the KOP and the SEZ.



**Figure 3.20-1: Viewshed from the San Antonio Mountain WVA KOP, including Antonito Southeast SEZ**

### 3.20.2 KOP Description

*KOP Name:* San Antonio Mountain WVA

*KOP Location:* The San Antonio Mountain WVA is located on the eastern side of U.S-285 in New Mexico, approximately 9.4 mi south of the Colorado-New Mexico border. See Figure 3.20-1.

*Critical or Representative KOP:* Critical, representative

*Critical Nature of Affected View (if applicable):* A large number of people stop here to view and photograph wildlife in an area that includes the SEZ.

*Rationale for Selecting KOP:* This KOP was selected because large numbers of viewers stop here for visually-related activities.

*KOP Access Modes:* Primarily automobile, truck, and bicycle.

### 3.20.3 Visual Context

*General Description:* Highly scenic and panoramic view of a vast expanse of treeless open grasslands, with Cerro de la Olla and Ute Mountain as prominent focal points in the background. The Sangre de Cristo Mountains and San Luis Hills can be seen in the far distance. Two low knolls in the middle foreground. See Figure 3.20-2.

*Cultural Modifications Visible within the KOP Viewshed:* Distant ranch buildings, fences, two-track roads, small utility poles, but primarily natural appearing landscape.

*Direction of View toward SEZ:* Northeast

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approximately 8°. See Figure 3.20-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* There is intermittent visibility of the center portion of the Antonito Southeast SEZ from San Antonio Mountain WVA KOP. The majority of the western and eastern portions of SEZ are screened by topography. As seen from the WVA, PV facilities would be visible on approximately 256 ac (3%) of the SEZ. Parabolic trough facilities could potentially be visible on 1,304 ac (13%) of the SEZ.

*Orientation of the solar energy development within the field of view:* The SEZ is to the left of approximate center of view.



**Figure 3.20-2 Photograph of Existing Landscape from San Antonio Mountain Wildlife Viewing Area KOP Looking toward Antonito Southeast SEZ**



**Figure 3.20-3 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from San Antonio Mountain Wildlife Viewing Area KOP**

### 3.20.4 Visual Contrast Rating

A BLM visual contrast rating was conducted for the San Antonio Mountain WVA KOP on August 14, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned form is available in Appendix A. The contrast rating is presented in Table 3.20-1.

**Table 3.20-1 Visual Contrast Rating for San Antonio Mountain WVA KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√					√			√	
	Line			√					√			√	
	Color			√					√			√	
	Texture			√					√			√	

The overall contrast rating for the San Antonio Mountain WVA KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

Contrast was judged to be weak because at most solar developments in the SEZ would occupy an area only about 8° wide on the horizon, and in most of the area, only the tops of parabolic trough facilities would be visible; PV facilities would be below the horizon. If only PV facilities were located in the SEZ, it is likely that they would go unnoticed unless there was a glare event in the very small area where they could be seen. The presence of parabolic trough facilities within the

SEZ would be likely to result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources, but in most viewing conditions they would not likely be noticed by casual observers.

Because the San Antonio Mountain WVA KOP is southwest of the SEZ, glare incidents might be observed occasionally, though typically the duration would be brief. During glare incidents the degree of contrast could be *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within a small area of the Antonito Southeast SEZ would be visible at a distance of between 9.4 and 11.9 mi from the San Antonio Mountain WVA KOP. This distance is in the BLM background distance zone; thus the shapes and colors of structures within the SEZ would be visible, but surface details of structures would not generally be visible, and solar collector/reflectors would generally be seen as a block of color rather than individual elements.
- **Angle of Observation.** The SEZ is at a slightly lower elevation than the San Antonio Mountain WVA, and intervening terrain blocks most of the view of the SEZ from the KOP. Where a clear line of sight exists, the angle of view is very low, and solar facilities would be visible as a very thin line just above the horizon, except for a very small area in the SEZ in the South Piñon Hills that is slightly elevated. Because of the distance and very low angle of view, it is very unlikely that persons not familiar with the nature of the SEZ and its location would recognize it as consisting of solar facilities.
- **Length of Time the Project Is In View.** For visitors to the San Antonio Mountain WVA, views would typically be brief, because many stops are brief, but also because attention is more likely to be focused away from the SEZ, which is at the left side of the general view.

- **Relative Size or Scale.** Because of the limited visibility and the very low viewing angle, the apparent size of the SEZ and facilities within it would be greatly reduced, and would be in scale with other landscape elements.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZ would create color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels. Because of the open nature of the landscape between the San Antonio Mountain WVA and the SEZ, defoliation of trees in the fall would not change views of solar development in the SEZ substantially. In certain conditions when air temperatures are low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase; this could increase facility substantially because the plumes would be moving, generally vertical elements in a still and strongly horizontal landscape.
- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the San Antonio Mountain WVA is south of the SEZ, incidence of glare from the collector array is possible, but would likely be rare and brief in duration. When glare occurs, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly, especially for viewers in moving vehicles. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Given the lack of lighting in the existing landscape both in and south of the SEZ, lighting from solar facilities in the SEZ might be noticeable.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.

- **Spatial Relationships.** Solar developments within the SEZ would be observed from a very low vertical angle of view across the base of a somewhat distant low mountain ridge. The low forms and generally horizontal lines of the solar developments within the SEZ would repeat the strong horizontal lines and low forms of the existing landscape. Ute Mountain is conspicuous in the view, and would tend to draw attention away from the SEZ.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.20.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The San Antonio Mountain WVA is a designated and signed wildlife viewing area that is used for wildlife viewing and photography. Solar facilities within the SEZ might be visible from the WVA. Industrial development is inconsistent with the mostly natural appearing visual character of the surrounding landscape. Some WVA viewers might find the view of industrial-scale solar facilities unattractive and inappropriate.

*Summary of level of visual exposure based on the representative VRM class objective:* Solar development in the SEZ could be visible to persons at the WVA, but because of the low height of the facilities, the very low angle of view, the screening of most of the SEZ by topography, and the fact that viewer attention is not likely to be focused in the direction of the SEZ, solar facilities in the SEZ would likely be missed by most casual observers. This would particularly be true if development was limited to PV facilities.

If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents would make them more visible, but under normal viewing conditions they would still be unlikely to be noticed by a casual observer. During glare incidents, the bright reflected light could attract the attention of casual observers, and solar facility lighting could be noticeable at night.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Visitors to the WVA are not likely to be particularly sensitive to the sight of solar development. Many would visit the WVA for a short period of time, and their views would generally be focused away from the SEZ.

As seen from the San Antonio Mountain WVA, solar development in the Antonito Southeast SEZ would appear as a relatively short, thin horizontal line of dark or light color (depending on technology type and lighting) with very small angular forms of buildings visible projecting slightly above it at the base of the distant San Luis Hills.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color (especially as seen from the north, where views would generally be looking at the shadowed backs of the solar arrays), and lack of visible water vapor plumes would make them very unlikely to be noticed by casual observers. An exception would be when glare events occurred and caused bright reflections which would likely be noticed by casual observers; however, these events would be rare and likely of brief duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they could be nearly invisible at night, but any lights might be noticeable because the existing landscape has very little lighting visible.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them more visible than PV facilities, but they still would not likely be noticeable to casual observers.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Because the San Antonio Mountain WVA does not have an unobstructed view of either the Los Mogotes East or De Tilla Gulch SEZs, no cumulative visual impacts from simultaneous viewing of multiple solar development within these SEZs is anticipated. If visitors to the WVA see solar facilities in the Antonito Southeast SEZ drive up U.S. 285 past the Los Mogotes SEZ, they could be subject to cumulative impacts through sequential viewing of multiple facilities.

### **3.20.6 Regional Compensatory Mitigation Recommendation**

Primarily because of screening by topography, solar energy development in most of the Antonito Southeast SEZ would not be visible from the San Antonio Mountain WVA. Furthermore, the visual contrast rating for the San Antonio Mountain WVA KOP indicated that solar development in the Antonito Southeast SEZ would create weak visual contrasts under normal viewing conditions, and would not be noticeable to casual observers. Higher levels of visual contrast could occur during glare incidents, but because of the limited visibility of the SEZ from the WVA, glare incidents would be expected to be relatively rare. As a result, regional offsite mitigation is not recommended as compensation for potential visual impacts that might occur at the San Antonio Mountain WVA as a result of solar development in the Antonito Southeast SEZ.

### **3.21 U.S. Highway 285 (Representative KOPs: De Tilla North, Community of La Jara, Community of Romeo, Community of Antonito, “Welcome to Colorful Colorado” State Line Sign, San Antonio Mountain Wildlife Viewing Area)**

#### **3.21.1 VSA Description**

**VSA Type:** Point of Interest

**Potentially Impacting SEZ:** De Tilla Gulch SEZ, Los Mogotes East SEZ, Antonito Southeast SEZ

**Distance from SEZ to Affected Area within VSA:** U.S. Highway 285 (U. S. 285) passes within approximately 0.25 mi of the northwest boundary of the De Tilla Gulch SEZ, at the point of closest approach. Within the 25-mi viewshed of the SEZ, the farthest point on U. S. 285 is approximately 3.1 mi from the northeast corner of the SEZ. See Figure 3.21-1.

U.S. 285 passes within 2.7 mi of the eastern boundary of the Los Mogotes East SEZ. Within the 25 mi viewshed of the SEZ, the farthest point on U.S. 285 is 22.3 mi from the northern boundary of the SEZ, east of Monte Vista; however, visibility from U.S. 285 at that point would be limited by screening vegetation and structures southwest of U.S. 285. See Figure 3.21-1.

U.S. 285 passes through the southwest corner of the Antonito Southeast SEZ. Within the 25 mi viewshed of the SEZ, the farthest point on U.S. 285 is 12.2 mi from the southern boundary of the SEZ, just east of San Antonio Mountain. Theoretically, there is visibility on U.S. 285 up to 30 mi north of the SEZ at Alamosa, however, trees and structures effectively screen the Antonito Southeast SEZ from view of U.S. 285 just north of the community of Antonito. See Figure 3.21-1.

#### **Affected Area within the VSA:**

A total of 5.6 mi of U.S. 285 are located within the 25-mi viewshed of the De Tilla Gulch SEZ, in one segment northwest of the SEZ running southwest to northeast.

A total of 48.4 mi of U.S. 285 are located within the 25-mi viewshed of the Los Mogotes East SEZ, in two segments:

- The 40.7 mi main segment, running from approximately 5 mi southwest of Monte Vista, through Alamosa, La Jara, Romeo and Antonito; however, trees and structures provide partial screening for significant portions of the segment;
- A much smaller segment running from the northeast corner of the Antonito Southeast SEZ south approximately 10.2 mi. with intermittent visibility totaling 7.7 mi; however, as noted, trees and structures effectively screen the Los Mogotes East SEZ from view from

this segment of U.S. 285; however, if there were visibility of the SEZ from this part of U.S. 285, the contrasts would be weak.

A total of 50 mi of U.S. 285 are located within the 25-mi viewshed of the Antonito Southeast SEZ, in one segment starting just northwest of Alamosa, running alongside the western boundary of the Antonito Southeast and through the projecting southwest corner of the SEZ and ending just southeast of San Antonio Mountain; however, screening by trees and structures south of Antonito and by trees along the Conejos River effectively eliminates views of the SEZ from U.S. 285 north of Antonito.

**Estimated Annual Visitation/Usage in VSA:** CDOT estimates that 1,600 vehicles per day travel on U.S. 285 past the De Tilla Gulch SEZ. CDOT estimates that 6,200 vehicles per day travel on U.S. 285 through La Jara, and 1,000 vehicles pass the “Welcome to Colorful Colorado” sign adjacent to the Antonito Southeast SEZ each day on US-285. At an average of 1.55 persons/vehicle, total annual views of the SEZs from vehicles are approximately 5 million, many of which would be repeated views for commuters and visitors to U.S. 285. Persons using these roads would be a mixture of locals, tourists and truckers.

**Types of Activities within the Affected Area:** Driving, biking, sightseeing, photography, wildlife viewing, and hiking.

**Estimated proportion of visitors conducting each major activity type:** The majority of viewers would be drivers or passengers in vehicles passing through the area. Much of this traffic is likely to be local residents going to and from work, school, shopping, etc. or travelling the Los Caminos Antiguos Scenic and Historic Byway, which coincides with U.S. 285 between Romeo and Antonito.

**Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:** U.S. 285 is a major travel route through the SLV, and at both the northern and southern ends serves as a “gateway” to the SLV. Many visitors to the SLV enter the valley on U.S. 285, and the view from U.S. 285 is where their first visual impressions of the SLV are formed. As discussed in Section 3.19.6, U.S. 285 performs a similar “gateway” function for the state of Colorado, as northbound travelers pass the “Welcome to Colorful Colorado” sign at the Colorado-New Mexico state border. As noted in Section 3.18.1, according to the Los Caminos Antiguos Scenic and Historic Byway Partnership Plan, the purpose of the Los Antiguos Caminos Historic and Scenic Byway is to “Interpret, facilitate community development, and market the products of the cultural and historic traditions, natural resources, and diverse communities (LCASB 1999).” The plan goes on to state (pg. 27) that the Byway will be a vehicle for sustainable community economic development, and that the Byway Partners will “work to protect the open spaces and viewshed integrity along the byway.”

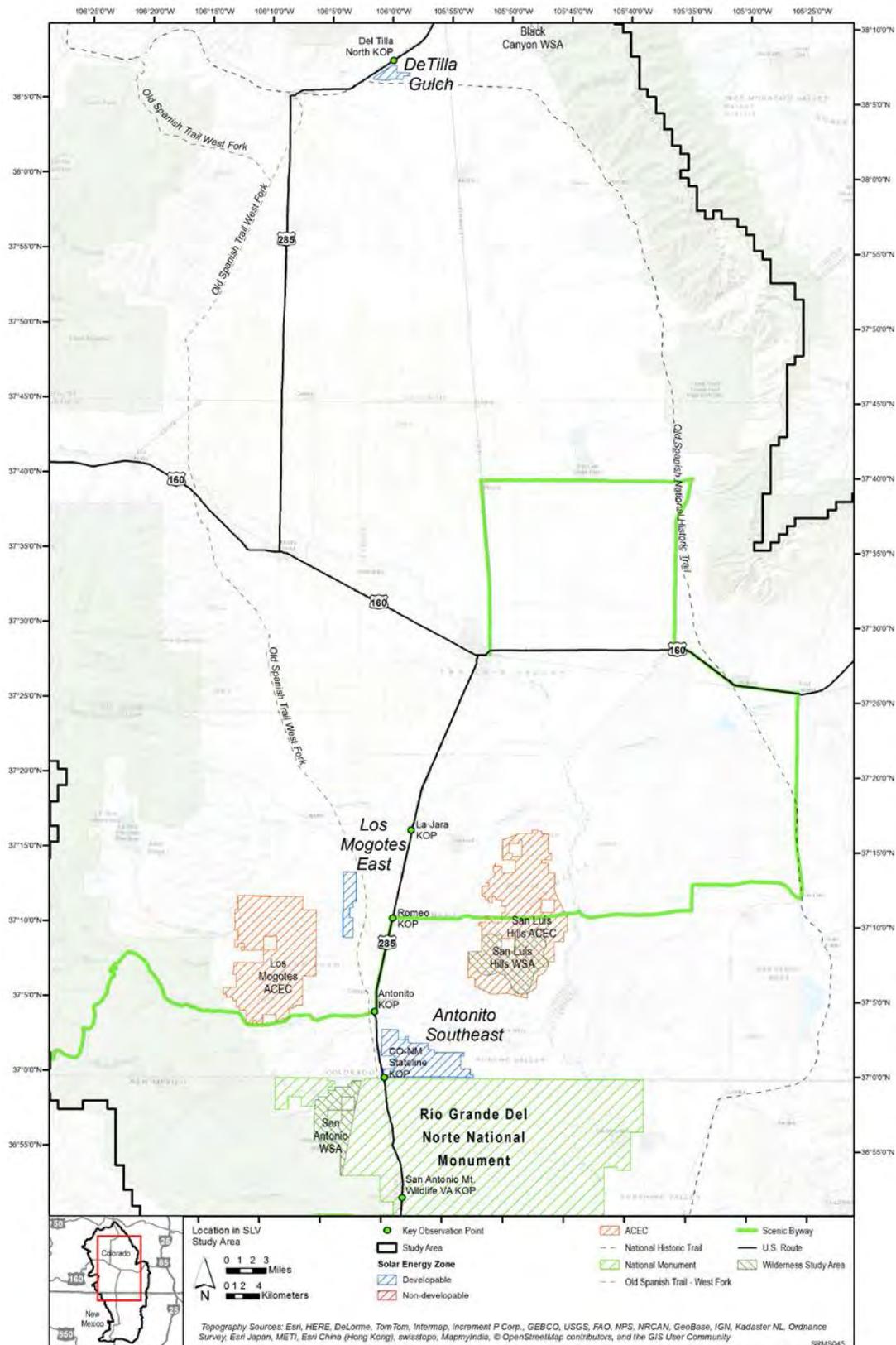


Figure 3.21-1 U.S. 285 and the De Tilla Gulch, Los Mogotes East, and Antonito Southeast SEZs

### 3.21.2 Summary of Impacts to KOPs

#### 3.21.2.1 Introduction

Six representative KOPs (De Tilla North, community of La Jara, community of Romeo, community of Antonito, “Welcome to Colorful Colorado” state line sign, San Antonio Mountain Wildlife Viewing Area) were used to analyze impacts to U.S. 285. The De Tilla North KOP was used to analyze impacts from solar development in the Los Mogotes East SEZ. The La Jara and Romeo KOPs were used to analyze impacts from solar development in the Los Mogotes East SEZ. The community of Antonito, “Welcome to Colorful Colorado” state line sign, San Antonio Mountain Wildlife Viewing Area KOPs were used to analyze impacts from solar development in the Antonito Southeast SEZ. The basis for deciding if regional compensatory mitigation for visual impacts to U.S. 285 is warranted would consider impacts to the representative KOPs and other points on U.S. 285 from which solar facilities in the SEZ would be visible, and the cumulative impacts of sequential or simultaneous views of solar facilities in the SEZs.

Impacts to the KOPs are discussed in detail in the following sections of this report:

- De Tilla North - Section 3.2
- LaJara - Section 3.8
- Romeo - Section 3.10
- Antonito - Section 3.14
- “Welcome to Colorful Colorado” state line sign - Section 3.19
- Romeo - Section 3.20

Cumulative impacts from solar energy development in the SEZs only, are discussed in Section 3.21.3 below.

#### 3.21.2.2 Summary of Impacts to the De Tilla North Representative KOP

The De Tilla North KOP is located at mile marker 95 on U.S. 285, 0.4 mi northwest of the northwestern boundary of the De Tilla Gulch SEZ. The KOP is near the point of closest approach of U.S. 285 to the SEZ; U.S. 285 passes within 0.25 mi of the SEZ just southwest of the KOP. The SEZ is within the BLM foreground-middleground zone of 0-5 mi. Viewed from the De Tilla North KOP, the SEZ would occupy 102° of the horizontal field of view.

A BLM visual contrast rating was conducted for the De Tilla North KOP. The overall contrast rating for the Romeo KOP is *Strong*, corresponding most closely to the VRM Class IV objective.

Travelers on U.S. 285 in the vicinity of the De Tilla Gulch SEZ would include residents, tourists, and other visitors to the Valley who would vary widely in their sensitivity to the visual contrast of solar facilities within the SEZ, with tourists and residents likely to be more sensitive than

others. Because the vast majority of viewers would be in vehicles traveling by the relatively small SEZ at high speed, the duration of views would typically be five minutes or less. The highway passes within 0.25 mi of the SEZ and is slightly elevated with respect to the SEZ. As a result, solar facilities within the SEZ would appear very large with respect to other objects visible in the landscape, and would occupy a large part of the field of view. The details of the complex but highly regular geometry of the solar array would be apparent, and would contrast strongly with the “organic” appearance of the surrounding existing shrub vegetation. Even with good mitigation for color contrasts, the black PV panels or silver surfaces of parabolic trough would contrast strongly with the grays, greens, tans, and other hues of the existing vegetation. As travelers passed the SEZ, the angles of view and lighting on solar facilities would change, and dramatic changes in the appearance of the facilities could occur very rapidly, adding to the overall contrast created by the facilities.

Glare events could occur, especially from parabolic trough facilities, and because of the short distance between the highway and the SEZ, could cause annoyingly bright reflections, though of short duration.

### **3.21.2.2 Summary of Impacts to the La Jara Representative KOP**

La Jara is located 5.2 mi northeast of the northeast corner of the Los Mogotes SEZ, on U.S. 285. The SEZ is located on an east-facing slope, southwest of La Jara. The SEZ is within the BLM background zone of 5-15 mi.

A BLM visual contrast rating was conducted for the La Jara KOP. The overall contrast rating for the La Jara KOP is *Weak*, corresponding most closely to the VRM Class II objective.

Travelers on U.S. 285 in the vicinity of the La Jara would include residents, tourists, and other visitors to the SLV who would vary widely in their sensitivity to the visual contrast of solar facilities within the SEZ, with tourists and residents likely to be more sensitive than others. Solar development within the SEZ would be visible intermittently for both northbound and southbound travelers on U.S. 285, because the view of the SEZ would often be screened by clumps or rows of trees and the numerous structures located west of U.S. 285.

As seen from U.S. 285 in the vicinity of La Jara, solar development in the Los Mogotes East SEZ would appear as a thin horizontal band of dark or light color (depending on technology type and lighting) with very small angular forms of buildings visible projecting slightly above it at the base of the Los Mogotes Peaks. The dark or light band would extend substantially northwards and to a lesser degree southwards from the peaks. The thin band of the solar arrays would be partially obscured by shrubs, small trees, and structures in the foreground of views from U.S. 285. Primarily because of the low angle of view and the foreground screening expected visual contrasts would be weak.

### 3.21.2.3 Summary of Impacts to the Romeo Representative KOP

Romeo is located 3 mi east of the Los Mogotes SEZ, on the east side of U.S. 285 at the intersection of U.S. 285 and CR 142. The SEZ is located on an east-facing slope, due west of Romeo. Most of the SEZ is within the BLM foreground-middleground zone of 3-5 mi.

A BLM visual contrast rating was conducted for the Romeo KOP. The overall contrast rating for the Romeo KOP is *Moderate*, corresponding most closely to the VRM Class III objective.

From U.S. 285 near Romeo, solar facilities within the SEZ would appear very large with respect to other objects visible in the landscape, and would occupy a large part of the field of view. The details of the complex but highly regular geometry of the solar array would be apparent, and would contrast strongly with the “organic” appearance of the surrounding existing vegetation. The black PV panels or silver surfaces of parabolic trough mirrors would contrast strongly with the grays, greens, tans, and other hues of the existing vegetation. Glare events could occur as travelers on U.S.285 approached the facility, especially from parabolic trough facilities, and could cause annoyingly bright reflections. For these travelers, contrasts could reach moderate levels, but the vast majority of travelers on U.S. 285 would be exposed to the contrast for only a few minutes as they approached Romeo, and at least parts of the SEZ would be screened by trees and structures in and around Romeo. Given that the SEZ would be in view for only a few minutes in the vicinity of Romeo, visual contrasts would likely be weak.

### 3.21.2.4 Summary of Impacts to the Antonito Representative KOP

Antonito is located 1.6 mi north of the northwest corner of the Antonito Southeast SEZ. U.S. 285 passes within 1.5 mi of the SEZ just south of Antonito, near the C&T RR depot.

A BLM visual contrast rating was conducted for the Antonito KOP. The overall contrast rating for the Antonito/Los Caminos KOP is *Weak*, corresponding most closely to the VRM Class II objective.

In most parts of Antonito, including U.S. 285 in this area, the SEZ is largely screened by structures or vegetation, including trees lining the Rio San Antonio. The angle of view from the KOP to the SEZ is very low, and where screening was absent, solar facilities would be visible as a very narrow band at the foot of a distant, low mountain ridge. For travelers on U.S. 285, in either direction, solar facilities in the SEZ would be seen very briefly in gaps through the screening vegetation.

Northbound travelers on U.S. 285 would have the SEZ on their right as they approached Antonito, but views of the SEZ would largely be screened, and then they would turn north toward Romeo, and the SEZ would be behind them.

Southbound travelers on U.S. 285 would drive toward the SEZ as they approached Antonito, but buildings and trees in Antonito would screen views toward the SEZ almost completely, and the trees along the Rio San Antonio farther south would provide further screening.

#### **3.21.2.4 Summary of Impacts to the “Welcome to Colorful Colorado” State Line Sign KOP**

The “Welcome to Colorful Colorado” state line roadside sign is located less than 0.1 mi south of the southwest corner of the Antonito Southeast SEZ.

A BLM visual contrast rating was conducted for the “Welcome to Colorful Colorado” state line sign KOP. The overall contrast rating for the KOP is *Strong*, corresponding most closely to the VRM Class IV objective.

As seen from the Colorado welcome sign, solar facilities in the Antonito Southeast SEZ would be visually dominant elements across much of the field of view to the east of U.S. 285. For northbound travelers, solar facilities could stretch across much of the northern view, on both sides of the roadway, as the KOP is just south of the SEZ. The uniform colors and details of the complex but highly regular geometry of the solar arrays would be apparent, and would contrast strongly with the “organic” colors and textures of the surrounding existing vegetation. Glare events could occur as travelers on U.S.285 approached the facility, especially from parabolic trough facilities, and could cause annoyingly bright reflections.

Travelers on U.S. 285 in the vicinity of the KOP would vary widely in their sensitivity to solar development. For travelers on U.S. 285 in the vicinity of the KOP, the solar facilities would appear as a large-scale industrial development in an otherwise natural/rural setting, although there is some development visible to the north, include industrial development. The solar facilities would contrast strongly with the generally natural-appearing surrounding landscape elements.

#### **3.21.2.6 Summary of Impacts to the San Antonio WVA Representative KOP**

The San Antonio Mountain WVA KOP is located on the eastern side of U.S-285 in New Mexico, approximately 9.4 mi south of the Colorado-New Mexico border. Solar development within a small area of the Antonito Southeast SEZ would be visible at a distance of between 9.4 and 11.9 mi from the KOP. The SEZ is within the BLM background zone of 5-15 mi. The SEZ would cover a small portion of the horizontal field of view (8°).

A BLM visual contrast rating was conducted for the San Antonio Mountain WVA KOP. The overall contrast rating for the San Antonio Mountain WVA KOP is *Weak*, corresponding most closely to the VRM Class II objective.

Solar development in the SEZ could be visible to travelers on U.S. 285 near the WVA, but because of the low height of the facilities, the very low angle of view, the screening of most of

the SEZ by topography, solar facilities in the SEZ would likely be missed by most casual observers.

### **3.21.3 Summary of Impacts to Other Locations on U.S. 285**

Between Alamosa and Antonito, southbound travelers on U.S. 285 would have some clear views of the Los Mogotes SEZ on their right, but the angle of view would be low, and vegetation and structures would screen part of the SEZ from view. Where the view was clear, contrasts under normal viewing conditions could be moderate near Romeo. In about two minutes at highway speed, they would be past the SEZ, and therefore much less likely to look at it, but if they did, contrast levels would decrease as they drove south.

Northbound travelers on this stretch of U.S. 285 would not see solar facilities in the Los Mogotes East SEZ until they had passed through the trees that line the course of the Conejos River approximately 1.5 mi north of Antonito. After passing through trees, travelers on U.S. 285 would have some clear and some partially screened views of solar facilities in the Los Mogotes SEZ. Contrast could rise to moderate levels in this stretch of U.S. 285, until reaching Romeo to turn east on U.S. 285 after about 5 minutes travel time, however, significant portions of the SEZ would be screened from view in many places by trees and house along the highway.

As southbound travelers on U.S. 285 passed Antonito the view of solar facilities in the Antonito Southeast SEZ would open up just south of the Rio San Antonio, after crossing a band of trees along the river; however, industrial facilities would be visible in front of the SEZ for the first mile south of the river. For the next 3.7 mi (about 3.5 minutes at highway speeds), the solar facilities in the SEZ would dominate the views to the east, as they would be very close to the highway. Because of the close approach of U.S. 285 to the SEZ, the appearance of the facilities within the SEZ would change dramatically as travelers approached and then passed the SEZ, with the visual patterns, apparent colors, and reflectivity of facility surfaces subject to large changes in the space of a few seconds. For period of less than a minute, the highway would pass through the southwest corner of the SEZ, and so travelers could be viewing solar facilities at very short distances, resulting in very strong visual contrasts. After passing through the SEZ, the SEZ would be behind southbound vehicles, and much less likely to be seen.

Northbound travelers on U.S. 285 in New Mexico would be subject to visual contrasts from solar facilities in the Antonito Southeast SEZ for about 16 mi (about 15 minutes) as they approached and passed the SEZ. The SEZ would come into view just southeast of San Antonio Mountain, and contrast would quickly rise to strong levels because vehicles would be driving toward the longest side of SEZ, with an unobstructed view, and the solar facilities in the SEZ would gradually increase in apparent size, eventually covering the entire horizontal field of view to the northeast. Solar facilities could be visible on both sides of the roadway, as U.S. 285 passes through the southwest corner of the SEZ. The uniform colors and details of the complex but highly regular geometry of the solar arrays would be apparent, and would contrast strongly with

the “organic” colors and textures of the surrounding existing vegetation. Glare events could occur as travelers on U.S. 285 approached the facility, especially from parabolic trough facilities, and could cause annoyingly bright reflections. After passing through the SEZ, the SEZ would be behind northbound vehicles, and much less likely to be seen.

#### **3.21.4 Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs**

Travelers on U.S. 285 would be subject to cumulative visual impacts from sequential views of solar facilities if they drove on U.S. 285 past the De Tilla Gulch, the Los Mogotes East and Antonito Southeast SEZs. Because of the close approach of U.S. 285 to the De Tilla Gulch and Antonito Southeast SEZs, cumulative impacts from those SEZs would be greatest, but of course not all travelers on U.S. 285 would pass by all three facilities in one trip. For those who do, the strong contrasts from two of the three SEZs, with potentially moderate contrasts from Los Mogotes SEZ could not be missed, and would constitute substantial cumulative impacts.

#### **3.21.5 Regional Compensatory Mitigation Recommendation**

Six representative KOPs were used to analyze impacts to U.S. 285, and these analyses were supplemented by the analysis of visual contrasts for the remainder of U.S. 285. These analyses show that users of U.S. 285 could be subjected to moderate visual contrasts as they approached and passed the Los Mogotes East SEZ, and strong contrasts from the De Tilla Gulch and Antonito Southeast SEZs. For those driving the length of U.S. 285 in the area, substantial cumulative visual impacts will occur. Other development is visible in the area, especially around La Jara, Romeo, Manassa, and Antonito; however, the overall visual impression of the area is a rural/agricultural or small town setting with widely scattered farm and ranch buildings, with a mostly natural appearing backdrop of hills or mountains. The presence of industrial facilities in the rural visual setting is inconsistent with the area’s landscape character.

A very large number of people on U.S. 285 would be exposed to the visual contrasts from solar facilities in the SEZ. Persons driving on U.S. 285 would vary from low to high viewer sensitivity. Many would be commuters or others not seeking scenic/historic views/experiences and would likely have low sensitivity, while other drivers would have chosen to travel U.S. 285 expressly because of the opportunities for scenic/historic views and experiences on the Los Caminos Antiguos Scenic and Historic Byway, and would likely have high sensitivity.

While views of the both the Los Mogotes and the Antonito Southeast SEZ are fully or partially screened in many places along U.S. 285, there are long stretches of the highway with short-distance, unobstructed views of both the De Tilla Gulch and Antonito Southeast SEZs. Northbound travelers on U.S. 285 in New Mexico will be the most impacted because of the extended view of the Antonito Southeast SEZ in the direction of travel, thus increasing both visual contrast and view duration. For these travelers, the overall impact of seeing multiple large solar facilities in the SEZs is likely to be major. Furthermore, both the De Tilla Gulch and

Antonito Southeast SEZs are located at or near visual gateways to the SLV, and in the case of Antonito Southeast SEZ, at a visual gateway to the State of Colorado. As a result, regional compensatory mitigation is recommended as compensation for potential visual impacts that might occur to U.S. 285 as a result of solar development in the De Tilla Gulch, Los Mogotes East, and Antonito Southeast SEZs.

### **3.22 San Antonio WSA (Also Representative KOP for Rio Grande Del Norte National Monument)**

#### **3.23.1 VSA Description**

*VSA Type:* Specially Designated Area

*Potentially Impacting SEZs:* Los Mogotes East, Antonito Southeast

*Distance from SEZ to Affected Area within VSA:* Within the WSA, solar facilities in the Antonito Southeast SEZ could be visible at distances between 1.6 mi and 8.2 mi from the closest point in the SEZ. See Figure 3.22-1.

Within the WSA, solar facilities in the Los Mogotes East SEZ could be visible at distances between 11.1 mi and 18.3 mi from the closest point in the SEZ. See Figure 3.22-2.

*Affected Area within the VSA:* The Antonito Southeast SEZ is located on a flat plain northeast of the San Antonio WSA. The total area of the San Antonio WSA is 7,317 acres. Photovoltaic facilities within the Antonito SEZ would be visible from 6,944 acres, or 95% of the San Antonio WSA. Parabolic Trough facilities would be visible from 7,001 acres, or 96% of the San Antonio WSA.

The Los Mogotes East SEZ is located on an east-facing slope north of the San Antonio WSA. Photovoltaic facilities within the Antonito Southeast SEZ would be visible from 1,492 acres, or 20% of the WSA. Parabolic trough facilities would be visible from 2,224 acres, or 30% of the WSA.

*Estimated Annual Visitation/Usage in VSA:* The WSA is a roadless area, making access difficult. Visitor estimates are not available; however, Brown (2015a) states visitation is likely similar to that of the San Luis Hills WSA, estimated at less than 12 visitors per year.

*Types of Activities within the Affected Area:* Activities in the WSA include hiking, camping, wild life viewing, photography and hunting (Brown 2015a).

*Estimated proportion of visitors conducting each major activity type:* Percentages of visitor use are not available (Brown 2015a).

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* WSAs identify relatively undeveloped areas with special ecological, geological, educational, historical, scientific, or scenic values. The San Antonio WSA was designated in part for its scenic values (BLM 2012). In May 2015, a bill was introduced in Congress for designation of the San Antonio WSA as a wilderness area (S.1240, Cerros del Norte Conservation Act, 2015).

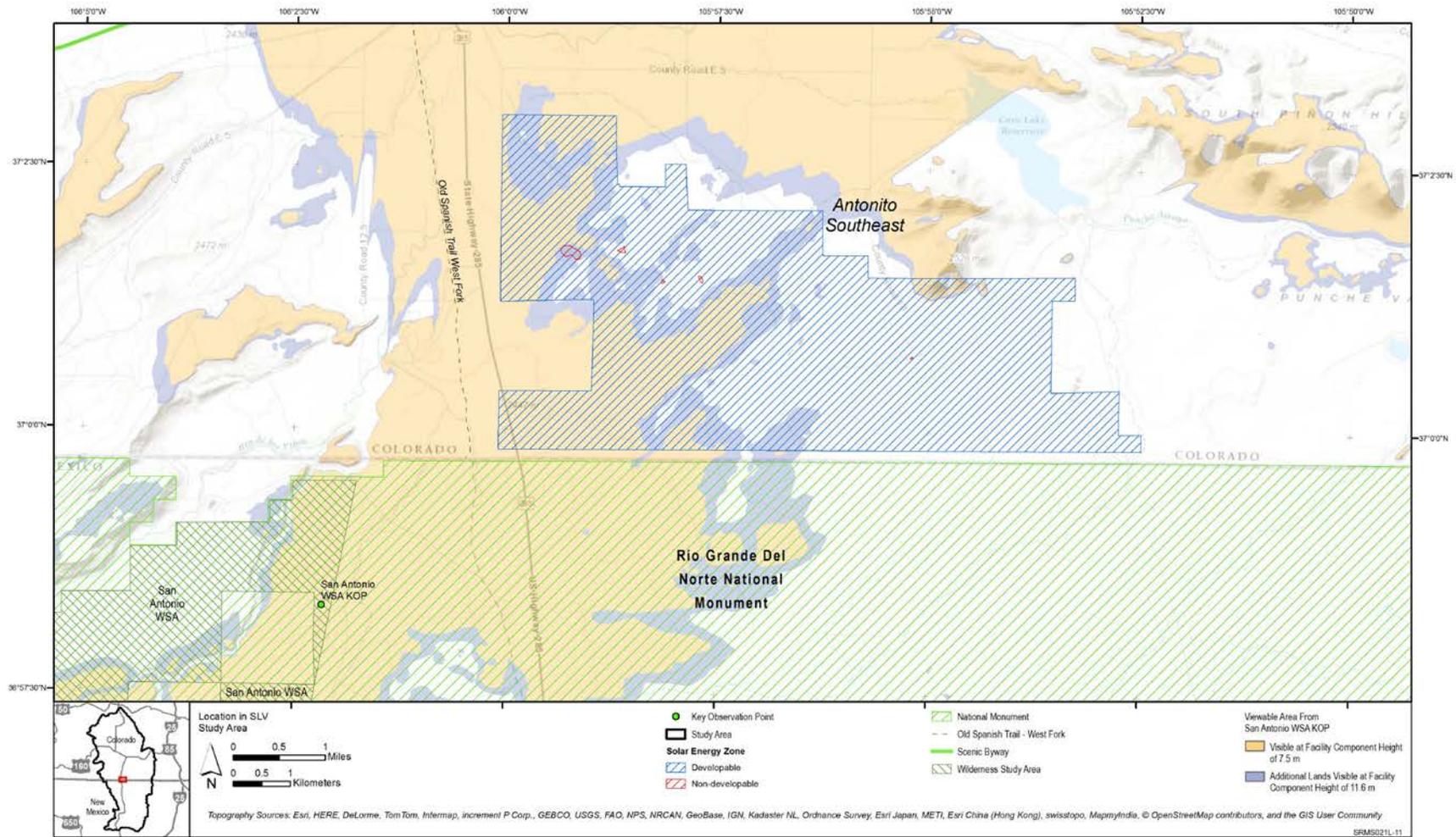


Figure 3.22-1: Viewshed from San Antonio WSA KOP, Including Antonito Southeast SEZ

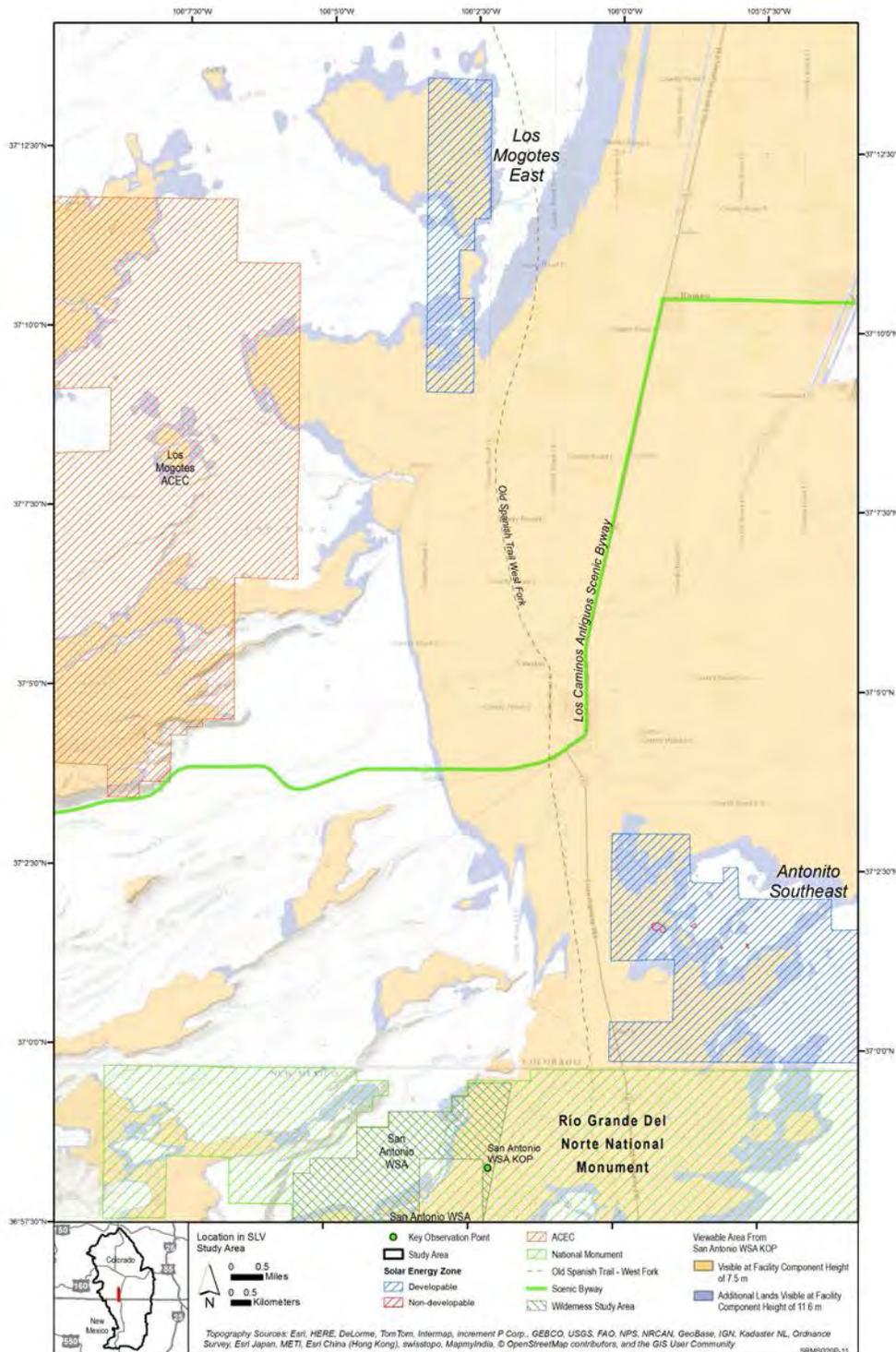


Figure 3.22-2: Viewshed from San Antonio WSA, Including Los Mogotes East SEZ

### 3.22.2 KOP Description

*KOP Name:* San Antonio WSA

*KOP Location:* Representative KOP is located within the San Antonio WSA, near a two-track road close to the eastern boundary of the northern portion of the WSA. See Figure 3.22-1.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* This KOP was selected as a representative view from the portion of the WSA within the SEZ viewshed.

*KOP Access Modes:* High-clearance vehicle for very rough unpaved roads to edge of WSA, then short hike to KOP. Could also be accessed by horseback, hiking, or possibly mountain bike.

### 3.22.3 Visual Context

*General Description:* This KOP offers a completely unobstructed 360° view of the San Luis Valley-Taos Plateau from this KOP. The landscape is mostly natural/natural-appearing with open rolling plains to the north, San Antonio Mountain to the south, and Ute Mountain and the San Luis Hills to east. The Sangre de Cristo Mountains can be seen in the far distance. See Figure 3.22-3.

*Cultural Modifications Visible within the KOP Viewshed:* Distant industrial facilities, communication towers, highway, local roads, small-town development; however, landscape is largely natural appearing.

*Direction of View toward SEZ:* Northeast (Antonito Southeast SEZ), North (Los Mogotes East SEZ).

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approximately 3° (Los Mogotes East SEZ). Approximately 53° (Antonito Southeast SEZ). See Figure 3.22-4.

*Acreage and Percentage of SEZ within KOP Viewshed:* There is good visibility of only the western portion of the Antonito Southeast SEZ from the San Antonio WSA KOP. The majority of the eastern portion of SEZ is screened by topography. As seen from the KOP, PV facilities would be visible on approximately 2,434 ac (25%) of the SEZ. Parabolic trough facilities could potentially be visible on 4,236 ac (44%) of the SEZ. As seen from the KOP, PV facilities would be visible on approximately 1,492 ac (56%) of the Los Mogotes East SEZ. Parabolic trough facilities could potentially be visible on 2224 ac (84%) within the Los Mogotes East SEZ.

*Orientation of the solar energy development within the field of view:* The Antonito Southeast SEZ occupies much of the right side of the view. The Los Mogotes East SEZ occupies a very small area on the left side the view.



**Figure 3.22-3 Photograph of Existing Landscape from San Antonio WSA KOP Looking Northeast**



**Figure 3.22-4 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from San Antonio WSA KOP**

**3.22.4 Visual Contrast Rating**

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* BLM visual contrast ratings for views of the two SEZs were conducted for the San Antonio WSA KOP on August 13, 2014, using Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZs. The scanned form is available in Appendix A. The contrast ratings are presented in Table 3.22-1.

Table 3.22-1 Visual Contrast Rating: Antonito Southeast SEZ, as Seen From San Antonio WSA KOP													
DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			√				√				√	
	Line			√				√				√	
	Color			√				√		√			
	Texture				√				√		√		

Primarily because of the close proximity of the Antonito Southeast SEZ, the overall contrast rating for the view of the Antonito Southeast SEZ from the San Antonio WSA KOP is *Strong*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast demands attention, will not be overlooked, and is dominant in the landscape.*” This corresponds most closely to the VRM Class IV objective. The VRM Class IV objective from Manual 8431 is “*...to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.*”

A contrast rating was not conducted from the San Antonio WSA KOP for the Los Mogotes East SEZ because field inspection showed that the SEZ would be screened from view by vegetation and structures between the KOP and the distant SEZ; however, close inspection of the viewshed analysis and topography via computer suggests that the tops of facilities might be visible over the tops of trees along the Conejos River, which are the primary non-topographic screening element. If the facilities were visible, however, given the screening, the long distance to the Los Mogotes East SEZ (12.4-17.4 mi), and the narrow horizontal angle of view (approximately 3°) and low vertical angle of view, the contrast would be weak, and the facilities likely would not be noticed by casual observers.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Antonito Southeast SEZ would be visible at a distance of 2.6 mi to 7.0 mi from the KOP. Most of the visible area in the SEZ is in the BLM foreground-middle ground distance zone; close enough that surface details of structures would generally be visible, and the closest solar collector/reflectors would generally be seen as distinct individual elements.
- **Angle of Observation.** The KOP (and the WSA in general) is slightly elevated with respect to the Antonito Southeast SEZ on the relatively flat valley floor, so that viewers at the KOP would be looking slightly down onto solar facilities in the SEZ. The vertical angle of view would still be low, however, and solar facilities in the SEZ would appear as a thin dark- or light-colored band (depending on lighting and collector/reflector orientation) at the base of the Piñon and San Luis Hills.
- **Length of Time the Project Is In View.** View duration would depend on the type of activity the viewers are engaged in; however, the panoramic view of the SLV attracts visual attention, and might prolong views for some visitors.
- **Relative Size or Scale.** Buildings and particularly the solar collector/reflector arrays within the SEZ could be close enough that they would appear much larger than existing structures, which are all distant and quite small in the existing view. The SEZ would cover a substantial portion of the horizontal field of view (51°), and facilities within the SEZ, viewed collectively, would be larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZs would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground,

particularly for PV facilities, which have black panels, but there would be very few visitors to the KOP area in snow conditions. Contrasts would likely be lower when vegetation was darker in color, especially for PV facilities. Because of the slightly elevated viewpoint and open and treeless nature of the landscape between the WSA and the SEZ, defoliation of trees in the fall would not change views of solar development in the SEZ substantially. In certain conditions when air temperatures were low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities could increase substantially.

- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is southwest of the Antonito Southeast SEZ, incidence of glare from both PV and parabolic trough collector/reflector arrays could occur, primarily in the afternoons at certain times of the year. When glare occurred, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Although the SLV has numerous lights visible at night, the Antonito Southeast SEZ is located in an area currently devoid of lighting, and the increase in lighting associated with solar facilities would be noticeable.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZs would be observed on the valley floor from a slightly elevated angle of view. The low forms and generally horizontal lines of the solar developments within the SEZs would be somewhat compatible with the horizontal lines of the horizon and low mountain ridges in the existing landscape; however, the visual contrast from the Antonito Southeast SEZ would likely be too strong to be overlooked.

- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ, but would not likely affect visibility substantially at the short distance between the WSA and the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.22.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* The San Antonio WSA was designated in part for its scenic values (BLM 2012), and visitors to the WSA may be seeking wilderness experiences; thus they could be sensitive to views of industrial development. Industrial development is inconsistent with the natural and rural visual character of the surrounding landscape, and is inconsistent with the wilderness experience. Some WSA visitors might find the view of industrial-scale solar facilities in the Antonito Southeast SEZs unattractive.

*Summary of level of visual exposure based on the representative VRM class objective:*

Regardless of the solar technology type, solar development in the Antonito Southeast SEZ could not be missed by casual observers in affected parts of the WSA. Under normal viewing conditions, it would be noticeable to casual observers, and would likely dominate the view to the northeast. If glare events occurred, contrast levels could be high enough that solar facilities in the SEZs would attract and hold visual attention, and could in fact be annoyingly bright. If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents would further increase contrast levels.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions.* Most visitors to the WSA would be considered to be sensitive viewers, and some might be highly sensitive. Solar facilities in the Antonito Southeast SEZ would be plainly visible to visitors and would dominate the view, both because of the short viewing distance involved, and the wide horizontal angle of view that would be occupied by solar facilities. However, visitation to the WSA is thought to be very low (Brown 2015a). There is only very minor other development visible from the KOP, and while some visual characteristics of solar facilities would be compatible with existing landscape elements; the high reflectivity of the collector/reflector arrays and very large size of the facilities and the SEZs as a whole would make them visually prominent.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them generally less noticeable than

parabolic trough facilities, but because of the size of the SEZ, they would still be noticeable as large blocks of dark or light color of an unnatural evenness, and likely with obviously artificial geometry. When glare events occurred and caused bright reflections, strong visual contrast would sometimes be observed; however, the glare events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they could add very little light pollution, but would still be visible.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Solar facilities in the De Tilla Gulch SEZs would not be visible from the WSA. In most locations within the WSA, the Los Mogotes East SEZ would not be visible either, but if it were, it would not be recognizable as containing solar facilities, which would minimize cumulative visual impacts from seeing multiple facilities at the same time.

### **3.22.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Antonito Southeast SEZs could cause strong visual contrasts depending for some viewers in the WSA, depending on the viewer location. At least some viewers would be considered sensitive to industrial development. Despite the strong visual contrast that would be expected, and the likely sensitivity of some viewers, the current estimated visitation to the WSA is so low that the total visual impact cannot be considered significant. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the San Antonio WSA as a result of solar development in the Antonito Southeast SEZ. However, it should be noted that visual impacts to the WSA viewed from solar development in the SEZ could potentially negatively affect the wilderness experience of WSA visitors.

### 3.23 San Antonio Mountain

#### 3.23.1 VSA Description

*VSA Type:* Area of Cultural Importance to Tribes

*Potentially Impacting SEZs:* Antonito Southeast, Los Mogotes East

*Distance from SEZ to Affected Area within VSA:* Solar facilities in the Antonito Southeast SEZ could be visible at distances between 9.5 mi and 13.5 mi from the approximate peak of San Antonio Mountain. See Figure 3.23-1.

Solar facilities in the Los Mogotes East SEZ could be visible at distances between 20.2 mi and 25.3 mi from the approximate peak of San Antonio Mountain. See Figure 3.23-1.

*Affected Area within the VSA:* The Antonito Southeast SEZ is located on a flat plain northeast of San Antonio Mountain. The upper slopes of San Antonio Mountain are forested, and visibility of the SEZ from much of the mountain would be screened by vegetation; however, where there are cleared areas, solar development in the SEZ would be visible from the northern and eastern slopes of the mountain as well as the mountain peak. See Figure 3.23-1.

The Los Mogotes East SEZ is located on an east-facing slope north of San Antonio Mountain. See Figure 3.23-1. Theoretically, solar development within the SEZ could be visible from the upper slopes of San Antonio Mountain; however, because of the relatively long distance to the SEZ (approximately 20-25 mi), the low vertical angle of view from the peak to the SEZ, and the fact that the side of the SEZ facing San Antonio Mountain is only 0.75 mi wide and thus occupies approximately 2° of the horizontal field of view, solar development in the SEZ is unlikely to be visible from San Antonio Mountain. If the SEZ was visible from San Antonio Mountain these visibility factors would ensure that it would cause negligible visual contrasts. Therefore, the remainder of this discussion will consider impacts from the Antonito Southeast SEZ only.

*Estimated Annual Visitation/Usage in VSA:* No estimate of visitation/usage was available.

*Types of Activities within the Affected Area:* Hiking, wildlife viewing, ranching, driving. San Antonio Mountain is a place of cultural importance to local Native American Groups (Higgins et al. 2013; Brown 2015a). Native Americans may still visit San Antonio Mountain for traditional and ritual purposes (Brown 2015a). There are a number of homes on the east side of San Antonio Mountain. Other individuals visiting San Antonio Mountain will likely be engaging in recreation and relaxation activities such as hiking and wildlife viewing. A communications tower is located at the summit of San Antonio Mountain and maintenance crews may visit this site when needed.

*Estimated proportion of visitors conducting each major activity type:* The majority of activity on San Antonio Mountain is from residents who reside in single-family homes on the east side of the mountain. Residents would be conducting everyday activities associated with owning a home. A smaller number of individuals would be visiting San Antonio Mountain to conduct maintenance of the communication or recreationists participating in the relaxation and recreation activities listed above. Native Americans may still visit San Antonio Mountain for ritual and traditional purposes; if so, the likely number of visitors is very low.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* Portions of San Antonio Mountain are in the Carson National Forest, however, no mention of San Antonio Mountain was found in a review of the Carson National Forest Management Plan.

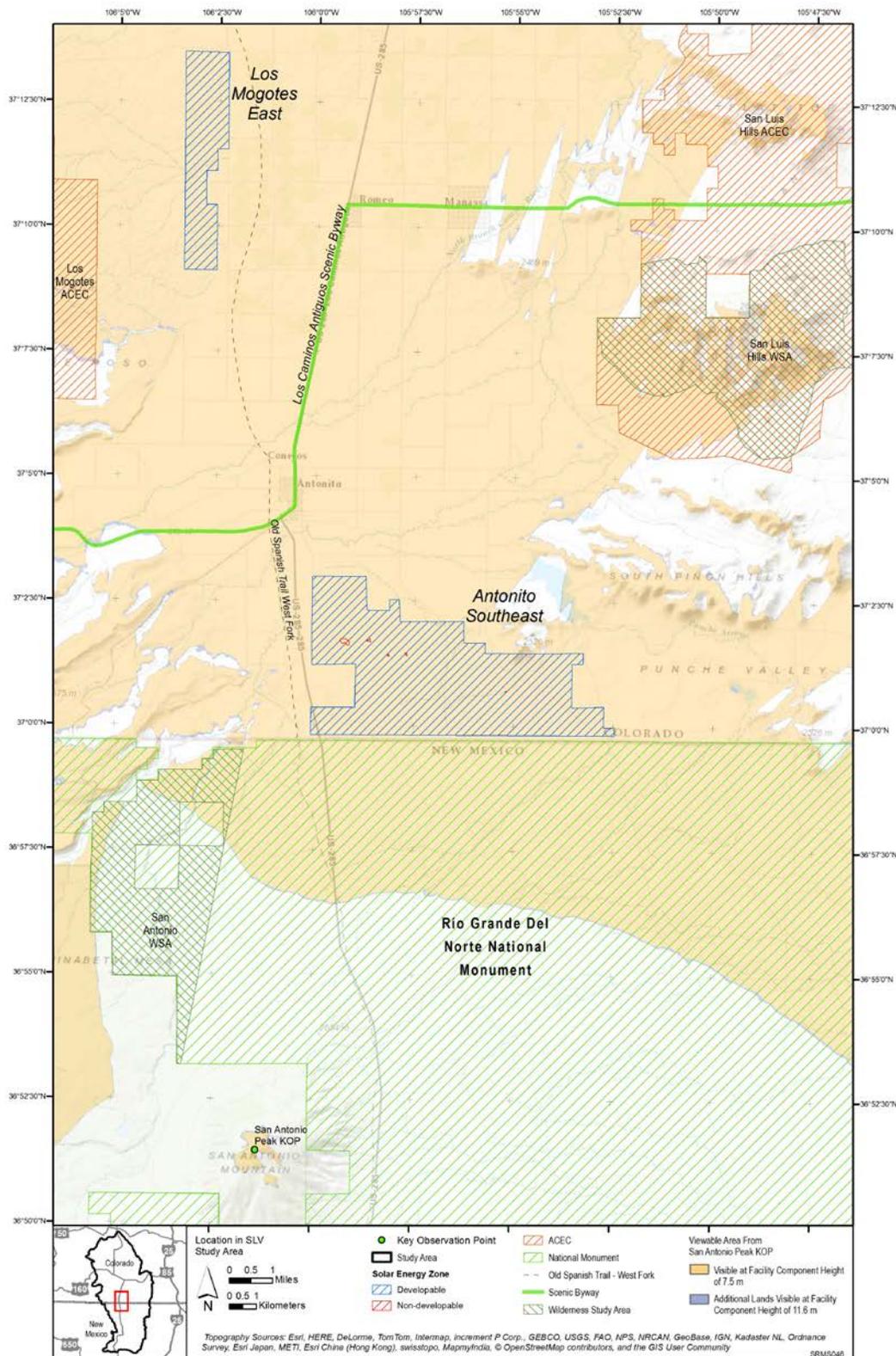


Figure 3.23-1: Viewshed from San Antonio Peak, Including Antonito Southeast and Los Mogotes East SEZs

### 3.23.2 KOP Description

*KOP Name:* San Antonio Mountain peak area. NOTE: Inclement weather precluded field-based analysis of the visual contrasts from San Antonio Mountain. Consequently, the analysis relies on examination of Google Earth views of the SEZ from the peak area, similarly to the analysis used for the Solar PEIS.

*KOP Location:* At peak of San Antonio Mountain.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The area around the KOP is a likely general destination for recreationists, and is representative of high-elevation views from San Antonio Mountain.

*KOP Access Modes:* High-clearance vehicle for rough unpaved roads to vicinity of KOP. Could also be accessed by horseback, hiking, or possibly mountain bike.

### 3.23.3 Visual Context

*General Description:* As noted, much of the upper slopes of San Antonio Mountain are forested, and many views would be completely or partially screened; however, there are numerous openings that may afford visibility of the SEZ. Where screening was absent, looking north-northeast from the peak of San Antonio Mountain onto the lower San Luis Valley, US-285 would be prominent in the foreground, running north, directing the eye to the SEZ, which is immediately east of the highway. Ute Mountain would be visible to the east, and the Piñon and San Luis Hills would be visible to the north beyond the SEZ.

*Cultural Modifications Visible within the KOP Viewshed:* Highway (US-285), local two-track roads, homes, utility poles, grazing land; however, the landscape is largely natural appearing.

*Direction of View toward SEZ:* North-northeast.

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approximately 36°. See Figure 3.23-2.

*Acreage and Percentage of SEZ within KOP Viewshed:* Where views were not screened by foreground vegetation, the entire SEZ would be visible from the KOP vicinity.

*Orientation of the solar energy development within the field of view:* The distant peaks of the San Juan Mountains almost due northwest of Ute Mountain would draw visual attention, thus the Antonito Southeast SEZ would be visible to the left of the center of the field of view.



**Figure 3.23-2 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from San Antonio Mountain Peak**

### 3.23.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* Because inclement weather prevented a field visit to the San Antonio Mountain peak KOP, a contrast rating was not conducted; however, examination of the view from the KOP to the SEZ suggests that because of the elevated viewpoint of the KOP and the large amount of the horizon that would be occupied by the SEZ (36°), solar development in the SEZ would likely cause strong visual contrasts for viewers at the KOP.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* As noted, the BLM visual contrast rating process was not used for the San Antonio Mountain KOP impact analysis; however, the following environmental factors were considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Antonito Southeast SEZ would be visible at a distance of 9.5 mi to 13.5 mi from the KOP. The visible area in the SEZ is in the BLM background distance zone; far enough that surface details of structures would generally not be visible, and the solar collector/reflector arrays in the SEZ would generally be seen as a massed light or dark block of color, depending on lighting and collector/reflector orientation.
- **Angle of Observation.** The KOP is elevated roughly 3,000 feet above the Antonito Southeast SEZ, which is located on the relatively flat valley floor, so that viewers at the KOP would be looking down onto solar facilities in the SEZ. The vertical angle of view would still be somewhat low, however, and solar facilities in the SEZ would appear as a narrow dark- or light-colored band (depending on lighting and collector/reflector orientation) at the base of the Piñon and San Luis Hills.
- **Length of Time the Project Is In View.** View duration would depend on the type of activity the viewers are engaged in; however, the panoramic view of the SLV attracts visual attention, and might prolong views for some visitors.
- **Relative Size or Scale.** The SEZ as a whole would cover a substantial portion of the horizontal field of view (36°), and facilities within the SEZ, viewed collectively, would be larger than any other developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZs would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels, but there would be fewer visitors to the KOP area in snow conditions. Contrasts would likely be lower when vegetation

was darker in color, especially for PV facilities. Trees in the immediate vicinity of the KOP are evergreen, and because of the elevated viewpoint and open and treeless nature of the landscape between San Antonio Mountain and the SEZ, defoliation of trees in the fall would not change views of solar development in the SEZ substantially. In certain conditions when air temperatures were low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities within the SEZ could increase substantially.

- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is south-southwest of the Antonito Southeast SEZ, incidence of glare from both PV and parabolic trough collector/reflector arrays could occur at certain times of the year. When glare occurred, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility greatly, but generally briefly. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Although the SLV has numerous lights visible at night, the Antonito Southeast SEZ is located in an area currently devoid of lighting, and the increase in lighting associated with solar facilities would be noticeable.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZs would be observed on the valley floor from an elevated angle of view. The low forms and generally horizontal lines of the solar developments within the SEZs would be somewhat compatible with the horizontal lines of the horizon and low mountain ridges in the existing landscape; however, the visual contrast from the Antonito Southeast SEZ would likely be too strong to be overlooked.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ.

- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.23.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Native Americans may still visit San Antonio Mountain for ritual and traditional purposes and they might see the presence of an industrial facility as visually intrusive. There a number of single-family homes on the east side of the Mountain. Development within the Antonito SEZ would not generally be visible from individual homes, but residents would potentially see development while driving up and down the mountain to US-285. Access to the peak is limited due to a communication site on top of the peak, but those who chose to visit the peak would likely be participating in recreation activities such as hiking and wildlife viewing. Industrial development is inconsistent with the natural-appearing visual character of the surrounding landscape and residents and visitors might find the view of industrial-scale solar facilities unattractive and out of place.

*Summary of level of visual exposure based on the representative VRM class objective:*

Regardless of the solar technology type, solar development in the Antonito Southeast SEZ could not be missed by casual observers on San Antonio Mountain where there were unobstructed views. Under normal viewing conditions, it could dominate the view to the northeast. If glare events occurred, contrast levels could be high enough that solar facilities in the SEZs would attract and hold visual attention, and could in fact be annoyingly bright. If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents would further increase contrast levels.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions.* Many visitors to San Antonio Mountain would be considered to be sensitive viewers, and some might be highly sensitive. Solar facilities in the Antonito Southeast SEZ would be plainly visible to visitors and might dominate the view, primarily because of the wide horizontal angle of view that would be occupied by solar facilities. However, visitation to the WSA is thought to be very low (Brown 2015a). There is only very minor other development visible from the KOP, and while some visual characteristics of solar facilities would be compatible with existing landscape elements; the high reflectivity of the collector/reflector arrays and very large size of the facilities and the SEZs as a whole would make them visually prominent.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them generally less noticeable than

parabolic trough facilities, but because of the size of the SEZ, they would still be noticeable as large blocks of dark or light color of an unnatural evenness, and likely with obviously artificial geometry. When glare events occurred and caused bright reflections, strong visual contrast would sometimes be observed; however, the glare events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they could add very little light pollution, but would still be visible.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Solar facilities in the De Tilla Gulch SEZs would not be visible from San Antonio Mountain. As noted, solar development in the Los Mogotes East SEZ would cause negligible visual contrast in the unlikely event that it was visible from San Antonio Mountain, thus cumulative impacts from solar facilities in multiple SEZs would not be expected.

### **3.23.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Antonito Southeast SEZs could cause strong visual contrasts for viewers on San Antonio Mountain, although views in many locations would be screened by foreground trees. At least some viewers would be considered sensitive to industrial development. Despite the strong visual contrast that would be expected, and the likely sensitivity of some viewers, because of the screening and the likely low level of visitation, the total visual impact cannot be considered significant. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the viewers on San Antonio Mountain as a result of solar development in the Antonito Southeast SEZ. However, it should be noted that the potential sensitivity of the area to tribes, and the sensitivity of tribal viewers engaged in ceremonial or other activities cannot be judged without more information, and if these sensitivities are large, they potentially could justify regional compensatory mitigation.

### **3.24 Ute Mountain (Also Representative KOP for Rio Grande Del Norte National Monument)**

#### **3.24.1 VSA Description**

*VSA Type:* Area of Cultural Importance to Tribes

*Potentially Impacting SEZs:* Antonito Southeast, Los Mogotes East

*Distance from SEZ to Affected Area within VSA:* Solar facilities in the Antonito Southeast SEZ could be visible at distances between 11.3 mi and 19.1 mi from the approximate peak of Ute Mountain. See Figure 3.24-1.

Solar facilities in the Los Mogotes East SEZ could be visible at distances between 24.8 mi and 28.6 mi from the approximate peak of Ute Mountain.

*Affected Area within the VSA:* The Antonito Southeast SEZ is located on a flat plain west-northwest of Ute Mountain. The upper slopes of Ute Mountain are forested, and visibility of the SEZ from much of the mountain would be screened by vegetation; however, where there were cleared areas, solar development in the SEZ would be visible from the northern and western slopes of the mountain as well as the mountain peak. See Figure 3.24-1.

The Los Mogotes East SEZ is located on an east-facing slope northwest of Ute Mountain. See Figure 3.24-1. Theoretically, solar development within the SEZ could be visible from the upper slopes of Ute Mountain; however, because of the very long distance to the SEZ (approximately 25-30 mi), the low vertical angle of view from the peak to the SEZ, solar development in the SEZ is unlikely to be visible from Ute Mountain. If the SEZ was visible from Ute Mountain these visibility factors would ensure that it would cause negligible visual contrasts. Therefore, the remainder of this discussion will consider impacts from the Antonito Southeast SEZ only.

*Estimated Annual Visitation/Usage in VSA:* No estimate of visitation/usage was available; however, because of the difficulty of access, and lack of communication towers, structures, or other features that would draw visitors, visitation/usage is likely to be very low.

*Types of Activities within the Affected Area:* Ute Mountain is a place of cultural importance to local Native American Groups (Higgins et al. 2013; Brown 2015a). Native Americans may still visit Ute Mountain for traditional and ritual purposes (Brown 2015a). Other individuals visiting Ute Mountain will likely be engaging in recreation and relaxation activities such as hiking, wildlife viewing, camping, relaxation, seeking solitude, or hunting.

*Estimated proportion of visitors conducting each major activity type:* The majority of visitors to Ute Mountain likely are participating in the relaxation and recreation activities listed above.

Native Americans may still visit Ute Mountain for ritual and traditional purposes; if so, the relative proportion of these visitors to all visitors to Ute Mountain is likely to be low.

*Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:* Ute Mountain is within the Rio Grande del Norte National Monument. Planning for the new national monument is underway as of this writing. In May 2015, a bill was introduced in Congress for designation of the Ute Mountain area as a wilderness area (S.1240, Cerros del Norte Conservation Act, 2015). Ute Mountain is promoted by BLM, local businesses, recreation organizations, and tourism promoters.

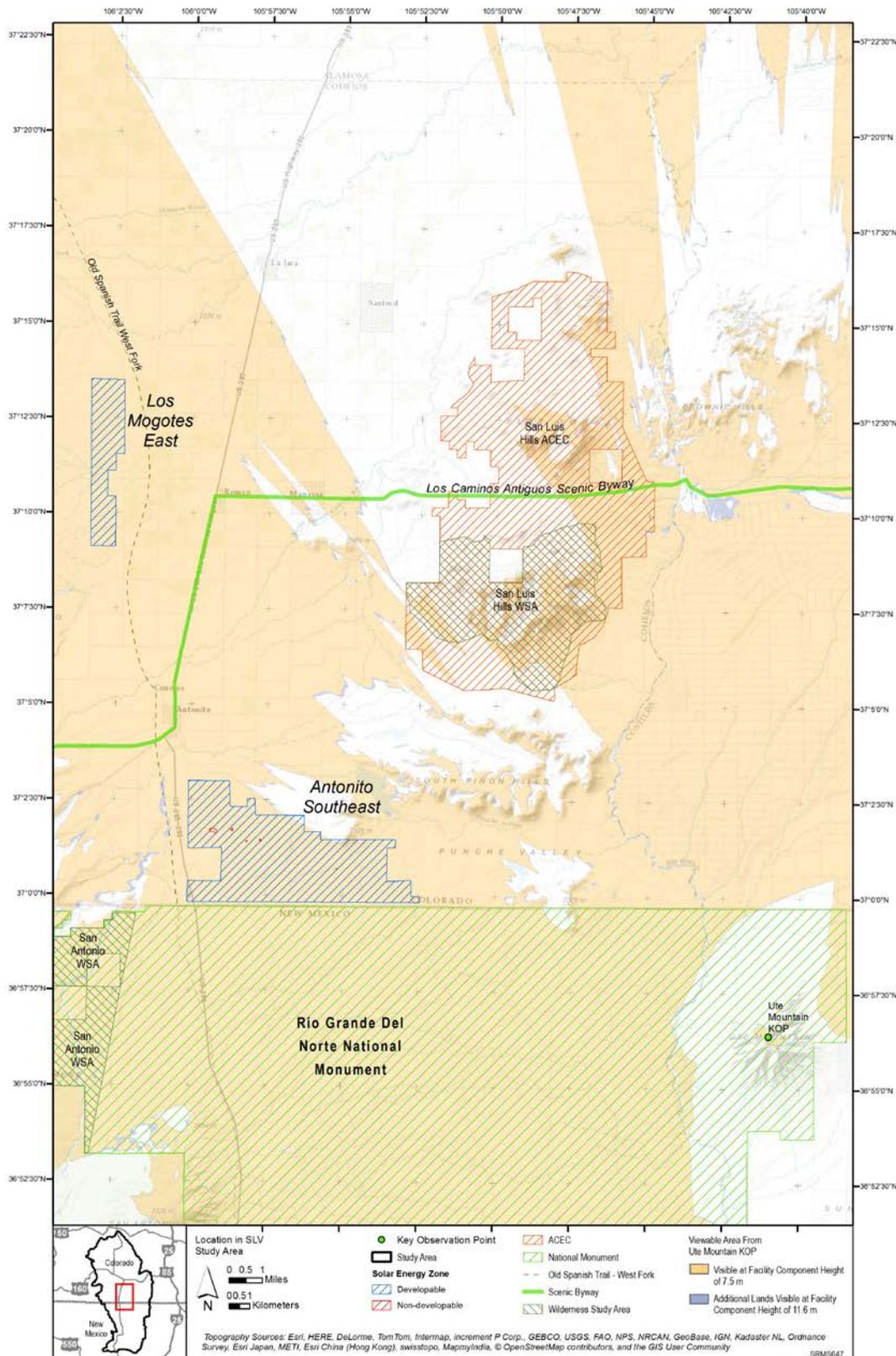


Figure 3.24-1: Viewshed from Ute Mountain, Including Antonito Southeast and Los Mogotes East SEZs

### 3.24.2 KOP Description

*KOP Name:* Ute Mountain base. NOTE: Inclement weather precluded field-based analysis of the visual contrasts from Ute Mountain. A KOP analysis was conducted from a point at the base of Ute Mountain, approximately 2.5 mi due west of the peak. Results for that KOP analysis are presented here, supplemented by analysis based on Google Earth views of the SEZ from the peak area, similarly to the analysis used for the Solar PEIS. Despite the slightly longer distance to the SEZ from the Ute Mountain peak than the KOP, the substantially greater elevation of the peak area would ensure that the visual contrasts seen from the peak area would likely be greater than those predicted for the KOP.

*KOP Location:* At western base of Ute Mountain.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The area around the KOP is accessible by unpaved road, and therefore likely to be used by recreationists, and is generally representative of views from the Ute Mountain area, although as noted above, views from the peak area would be higher elevation views. From the peak area, viewers would see more of the areal extent of the SEZ and facilities within the SEZ, and their generally rectilinear and artificial-appearing geometry would be more apparent.

*KOP Access Modes:* A high-clearance vehicle for rough unpaved roads is required to get to the Ute Mountain base KOP. It could also potentially be accessed by horseback, hiking, or possibly mountain bike. There are no roads or designated trails to the Ute Mountain peak area, so access to the upper slopes and peak would be by cross-country hiking or possibly horseback.

### 3.24.3 Visual Context

*General Description:* The upper slopes of Ute Mountain are forested, and some views would be completely or partially screened; however, there are numerous small openings that may afford visibility of the SEZ. Where screening was absent, the view would be to the northwest from the peak of Ute Mountain across the broad and flat San Luis Valley, with the distant peaks of the San Juan Mountains prominent to the northwest, and the Piñon and San Luis Hills visible in the foreground, and the Rio Grande Gorge very prominent at the base of Ute Mountain.

*Cultural Modifications Visible within the KOP Viewshed:* From the Ute Mountain base KOP, no cultural modifications are visible; the visible landscape is completely natural-appearing, except for the two-track road used to access the KOP. From the Ute Mountain peak vicinity, cultural modifications may be visible, but are likely to have minimal effect on the overall view.

*Direction of View toward SEZ:* West-northwest.

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approximately 16°. See Figure 3.24-2.

*Acreage and Percentage of SEZ within KOP Viewshed:* Where views were not screened by foreground vegetation, the entire SEZ would be visible from the Ute Mountain peak vicinity.

*Orientation of the solar energy development within the field of view:* The Piñon and San Luis Hills would draw visual attention, and the Antonito Southeast SEZ would be visible running across the base of the hills. The SEZ occupy a substantial portion to the right of the center of the view.



**Figure 3.24-2 Google Earth Schematic Visualization of Antonito Southeast and Los Mogotes East SEZs as Seen from the Peak of Ute Mountain**

### 3.24.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* As noted previously, inclement weather precluded field-based analysis of the visual contrasts from Ute Mountain. A KOP analysis was conducted from a point at the base of Ute Mountain (the Ute Mountain Base KOP), approximately 2.5 mi due west of the peak. Results for the Ute Mountain Base KOP analysis are presented here. Despite the slightly longer distance to the SEZ from the Ute Mountain peak than the KOP, the substantially greater elevation of the peak area would ensure that the visual contrasts seen from the peak area would likely be greater than those predicted for the KOP. The scanned form is available in Appendix A. The contrast ratings are presented in Table 3.24-1.

**Table 3.24-1 Visual Contrast Rating: Antonito Southeast SEZ, as Seen From Ute Mountain Base KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√			√				√	
	Line				√			√				√	
	Color				√		√			√			
	Texture				√			√				√	

The overall contrast rating for the view of the Antonito Southeast SEZ from the Ute Mountain Base KOP is *Moderate*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431) being “*The element contrast begins to attract attention and begins to dominate the characteristic landscape.*” This corresponds most closely to the VRM Class III objective. The VRM Class III objective from Manual 8431 is “*...to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.*”

During glare incidents, while contrasts would increase, potentially substantially, because of the distance to the facility, the glare contrast would attract attention but would not be expected to dominate the view, and would be relatively brief in duration. Contrast would not be expected to rise above *Moderate*.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Antonito Southeast SEZ would be visible at a distance of 9.5 mi to 16.9 mi from the Ute Mountain Base KOP. The visible area in the SEZ is primarily in the BLM background distance zone; far enough that surface details of structures would generally not be visible, and the solar collector/reflector arrays in the SEZ would generally be seen as massed light or dark blocks of color, depending on lighting and collector/reflector orientation.
- **Angle of Observation.** The Ute Mountain Base KOP is slightly lower in elevation than the Antonito Southeast SEZ, which is located on the relatively flat valley floor, so that viewers at the KOP would be looking slightly upslope to solar facilities in the SEZ. The vertical angle of view would be very low, and solar facilities in the SEZ would appear as a very thin dark- or light-colored band (depending on lighting and collector/reflector orientation) at the base and to the left of the Piñon Hills.
- **Length of Time the Project Is In View.** View duration would depend on the type of activity the viewers are engaged in; however, the panoramic view of the completely natural-appearing landscape attracts visual attention, and might prolong views for some visitors.
- **Relative Size or Scale.** The SEZ as a whole would cover a substantial portion of the horizontal field of view (16°), and facilities within the SEZ, viewed collectively, would be the only developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZs would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels, but there would be fewer visitors to the KOP area in most snow conditions. Contrasts would likely be lower when vegetation was darker in color, especially for PV facilities. Because of the elevated viewpoint and open and treeless nature of the landscape between San Antonio Mountain and the SEZ, defoliation of trees in the fall would not change views of solar development in the SEZ substantially. In certain conditions when air temperatures were low, the

visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities within the SEZ could increase substantially.

- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is east-southeast of the Antonito Southeast SEZ, incidence of glare from both PV and parabolic trough collector/reflector arrays could occur at certain times of the year. When glare occurred, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility noticeably, but generally briefly. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Although the SLV has numerous lights visible at night, the Antonito Southeast SEZ is located in an area currently devoid of lighting, and the increase in lighting associated with solar facilities would be noticeable.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZs would be observed on the valley floor from a very low angle of view. The low forms and generally horizontal lines of the solar developments within the SEZs would be compatible with the horizontal lines of the horizon and low mountain ridges in the existing landscape; however, the visual contrast from the Antonito Southeast SEZ would likely be too strong to be overlooked.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.24.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Native Americans may still visit Ute Mountain for ritual and traditional purposes and they may see the presence of industrial facilities as visually intrusive. Access to the peak is difficult, and those who chose to visit the peak might be seeking solitude, or enjoying the dramatic panoramic views of the almost completely natural appearing landscape. Industrial development is inconsistent with the natural-appearing visual character of the surrounding landscape and visitors might find the view of industrial-scale solar facilities unattractive and out of place.

*Summary of level of visual exposure based on the representative VRM class objective:*

Regardless of the solar technology type, solar development in the Antonito Southeast SEZ could not be missed by casual observers on Ute Mountain where there were unobstructed views. Under normal viewing conditions, it would dominate the view to the west-northwest. If glare events occurred, contrast levels could be high enough that solar facilities in the SEZs would attract and hold visual attention, and could in fact be annoyingly bright. If parabolic trough facilities were located in the SEZ, the greater height of the reflector array, more and larger structures, presence of plumes under some conditions, and increased likelihood of glare incidents would further increase contrast levels.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions.* Many visitors to Ute Mountain would be considered to be sensitive viewers, and some might be highly sensitive. Solar facilities in the Antonito Southeast SEZ would be plainly visible to visitors and would dominate the view, primarily because the elevated viewpoint from the Ute Mountain peak area would substantially increase the apparent size of the SEZ, and make its rectangular and obviously non-natural geometry apparent. The SEZ would contrast strongly in form, line, and color with the surrounding almost completely natural-appearing landscape. However, visitation to the Ute Mountain peak is likely to be low.

If solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them generally less noticeable than parabolic trough facilities, but because of the size of the SEZ, they would still be noticeable as large blocks of dark or light color of an unnatural evenness, and likely with obviously artificial geometry. When glare events occurred and caused bright reflections, strong visual contrast would sometimes be observed; however, the glare events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they could add very little light pollution, but would still be visible in the generally unlit vast expanse of the SLV in the vicinity of the SEZ.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility

of water vapor plumes, increased potential for glare, and higher level of lighting at night would make them substantially more visible than PV facilities.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Solar facilities in the De Tilla Gulch SEZs would not be visible from Ute Mountain. As noted, solar development in the Los Mogotes East SEZ would cause negligible visual contrast in the unlikely event that it was visible from Ute Mountain, thus cumulative impacts from solar facilities in multiple SEZs would not be expected.

### **3.24.6 Regional Compensatory Mitigation Recommendation**

Solar energy development in the Antonito Southeast SEZs would likely cause strong visual contrasts for viewers on Ute Mountain, although views in some locations near the peak of Ute Mountain would be screened by foreground trees. Some of the likely viewers would be considered sensitive to industrial development. Despite the strong visual contrast that would be expected, and the likely sensitivity of some viewers, because of the screening and the likely low level of visitation to Ute Mountain, at least at present, the total visual impact cannot be considered significant. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur to the viewers on Ute Mountain as a result of solar development in the Antonito Southeast SEZ. However, it should be noted that the potential sensitivity of the area to tribes, and the sensitivity of tribal viewers engaged in ceremonial or other activities cannot be judged without more information, and if these sensitivities are large, they potentially could justify regional compensatory mitigation. Additionally, if visitation to Ute Mountain increases in the future because of its inclusion in the National Monument, or if it is designated as a wilderness area or wilderness study area, the viewer sensitivity could increase, and regional compensatory mitigation might be justified.

### **3.25 Cerro De La Olla (Also Representative KOP for Rio Grande Del Norte National Monument)**

#### **3.25.1 VSA Description**

*VSA Type:* Area of Cultural Importance to Tribes

*Potentially Impacting SEZs:* Antonito Southeast

*Distance from SEZ to Affected Area within VSA:* Solar facilities in the Antonito Southeast SEZ could be visible at distances between 17.1 mi and 23.1 mi from the approximate peak of Cerro de la Olla. See Figure 3.25-1.

*Affected Area within the VSA:* The Antonito Southeast SEZ is located on a flat plain north-northwest of Cerro de la Olla. The lower slopes of Cerro de la Olla are forested, and visibility of the SEZ from parts of the mountain would be screened by vegetation; however, where there were cleared areas, solar development in the SEZ would be visible from the northern of the mountain as well as the mountain peak. See Figure 3.25-1.

*Estimated Annual Visitation/Usage in VSA:* No estimate of visitation/usage was available; however, because of the difficulty of access, and lack of communication towers, structures, or other features that would draw visitors, visitation/usage is likely to be low.

*Types of Activities within the Affected Area:* Cerro de la Olla is a place of cultural importance to local Native American Groups (Higgins et al. 2013; Brown 2015a). Native Americans may still visit Cerro de la Olla for traditional and ritual purposes (Brown 2015a). Other individuals visiting Cerro de la Olla will likely be engaging in recreation and relaxation activities such as hiking, wildlife viewing, camping, relaxation, seeking solitude, or hunting.

*Estimated proportion of visitors conducting each major activity type:* The majority of visitors to Cerro de la Olla likely are participating in the relaxation and recreation activities listed above. Native Americans may still visit Cerro de la Olla for ritual and traditional purposes; if so, the relative proportion of these visitors to all visitors to Cerro de la Olla is likely to be low.

*Role of affected area in the management objectives defined within the respective community/tribal comprehensive land use master plans, or SDA land use plans:* Cerro de la Olla is within the Rio Grande del Norte National Monument. Planning for the new national monument is underway as of this writing; reportedly, BLM is considering evaluating Cerro de la Olla for designation as a national conservation area (Brown 2015a). Brown (2015a) states that Cerro de la Olla is not heavily promoted or publicized, but is a well-known land mark and recreational area.



Figure 3.25-1: Viewshed from Cerro de la Olla, Including Antonito Southeast SEZ

### 3.25.2 KOP Description

*KOP Name:* Cerro de la Olla

*KOP Location:* Near summit of Cerro de la Olla.

*Critical or Representative KOP:* Representative

*Critical Nature of Affected View (if applicable):* N/A

*Rationale for Selecting KOP:* The summit area is relatively free of screening vegetation, has a clear view of the SLV to the north, and is representative of typical views from the upper slopes

*KOP Access Modes:* A high-clearance vehicle for rough unpaved roads is required to get to the base of Cerro de la Olla. There are no roads or designated trails to the Cerro de la Olla summit area, so access to the upper slopes and summit would be by cross-country hiking or possibly horseback.

### 3.25.3 Visual Context

*General Description:* The lower slopes of Cerro de la Olla are forested, and some views on the lower slopes would be completely or partially screened; however, there are numerous small openings that may afford visibility of the SEZ, and the upper slopes and large area near the summit are relatively free of screening vegetation. Where screening was absent, the view toward the SEZ would be to the north-northwest from near the summit of Cerro de la Olla across the broad, flat, and largely natural appearing landscape of the lower San Luis Valley-Taos Plateau. Major focal points include Ute Mountain to the north-northeast; San Antonio Mountain to the northwest, and Guadalupe Mountain to the northeast, with the distant peaks of the San Juan Mountains low but prominent to the north and northwest. See Figure 3.25-2.

*Cultural Modifications Visible within the KOP Viewshed:* The visible landscape is almost completely natural-appearing, except for a few two-track roads, and distant farm buildings and tanks.

*Direction of View toward SEZ:* North-northwest.

*Horizontal field of view (in degrees) potentially occupied by solar energy development within the SEZ:* Approximately 20°. See Figure 3.25-3.

*Acreage and Percentage of SEZ within KOP Viewshed:* Where views were not screened by foreground vegetation, the entire SEZ would be visible from the Cerro de la Olla summit area.

*Orientation of the solar energy development within the field of view:* Ute and San Antonio Mountains are prominent landmarks that draw visual attention. The Antonito Southeast SEZ would be visible across the left center of the view.



**Figure 3.25-2 Photograph of Existing Landscape from Cerro de la Olla KOP Looking toward Antonito Southeast SEZ**



**Figure 3.25-3 Google Earth Schematic Visualization of Antonito Southeast SEZ as Seen from the Cerro de la Olla KOP**

### 3.25.4 Visual Contrast Rating

*Visual Resource Contrast Rating Evaluation (BLM Handbook H-8431-1) and Closest VRM Class:* A BLM visual contrast rating was conducted for the Cerro de la Olla KOP on October 7, 2014, using a Google Earth visualization of the SEZ and photographs of existing solar facilities as guides to the likely appearance of solar facilities within the SEZ. The scanned contrast rating form is available in Appendix A. The contrast rating is presented in Table 3.25-1.

**Table 3.25-1 Visual Contrast Rating Cerro de la Olla KOP**

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY				VEGETATION				STRUCTURES			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				√				√				√
	Line				√			√					√
	Color				√			√					√
	Texture				√				√				√

The overall contrast rating for the Cerro de la Olla KOP is *Weak*, with the corresponding degree of contrast criterion (from BLM Visual Contrast Rating Manual 8431, but reproduced in Appendix B) being “*The element contrast can be seen but does not attract attention.*” This corresponds most closely to the VRM Class II objective, under normal lighting circumstances and especially if development was limited to PV facilities. The VRM Class II objective from Manual 8431 is “*...to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.*”

The presence of parabolic trough facilities within the SEZ would be likely to result in increased contrast, particularly on days when plumes were visible, if the facilities had cooling towers or other plume sources.

During glare incidents the degree of contrast could increase substantially; however, given the relatively long distance between the KOP and the SEZ (17.0-23.1 mi), and the very low vertical angle of view from the KOP to the SEZ, while the contrast might begin to attract attention, it would likely be too faint to dominate the view for viewers at the KOP and nearby locations.

*Description of Environmental Factors Influences on Degree of SEZ Noticeability for Casual Observers:* The BLM visual contrast rating process specifies that the following environmental factors be considered in the visual contrast analysis. See Appendix B for more information about the environmental factors.

- **Distance.** Solar development within the Antonito Southeast SEZ would be visible at a distance of 17.1 mi to 23.1 mi from the Cerro de la Olla KOP. The visible area in the SEZ is in the BLM seldom seen zone. At these longer distances, solar collector/reflector arrays could potentially be seen as blocks of color, but would lack surface details, i.e., individual panels/mirrors would not be discernable. Depending on atmospheric conditions, facilities at the longest distances might be difficult to see at all, and it is likely that persons not familiar with the nature of the SEZ and its location would not recognize it as consisting of solar facilities.
- **Angle of Observation.** The Cerro de la Olla KOP is approximately 1,500 higher in elevation than the Antonito Southeast SEZ, which is located on the relatively flat valley floor, so that viewers at the KOP would be looking slightly downward to solar facilities in the SEZ. Despite the elevated viewpoint, because of the long distance, the vertical angle of view would be low, and solar facilities in the SEZ would appear as a thin dark- or light-colored band (depending on lighting and collector/reflector orientation) to the left of the Piñon Hills.
- **Length of Time the Project Is In View.** View duration would depend on the type of activity the viewers are engaged in; however, the panoramic view of the almost completely natural-appearing landscape attracts visual attention, and might prolong views for some visitors.
- **Relative Size or Scale.** The SEZ as a whole would cover a substantial portion of the horizontal field of view (20°), and facilities within the SEZ, viewed collectively, would be the only substantial developed areas within the view.
- **Season of Use.** The apparent color of solar collector arrays varies substantially as lighting changes, but in general, solar facilities within the SEZs would create strong color contrasts with existing vegetation (generally tan or green depending on season) regardless of season of use. Contrast might be even stronger when snow is on the ground, particularly for PV facilities, which have black panels, but there would likely be few visitors to the KOP area in most snow conditions. Contrasts would likely be lower when vegetation was darker in color, especially for PV facilities. Because of the elevated

viewpoint and open and treeless nature of the landscape between San Antonio Mountain and the SEZ, defoliation of trees in the fall would not change views of solar development in the SEZ substantially except where there are deciduous trees in the foreground of the view, more common on the slopes of Cerro de la Olla. In certain conditions when air temperatures were low, the visibility of water vapor plumes from the cooling towers and/or gas boilers at parabolic trough facilities within the SEZ could increase substantially.

- **Lighting Conditions.** Because of the high reflectivity of the surfaces of solar collector/reflector arrays and some other facility components, the appearance of solar facilities may change substantially as the viewer moves, as the collectors/reflectors track the sun during facility operation (for facilities with tracking collectors/reflectors), or as lighting changes in the course of a day. Solar facilities can and routinely do cause glare that may be visible for very long distances. Because the KOP is south-southeast of the Antonito Southeast SEZ, incidence of glare from both PV and parabolic trough collector/reflector arrays could occur at certain times of the year. When glare occurred, it could be annoyingly bright for some viewers and would increase the visual contrast of the facility noticeably, but generally briefly. Glare might still be observed from other facility component surfaces, e.g., fences, pipes, but glare from these components could be reduced or eliminated through good visual impact mitigation practices.

Facility lighting would also cause visual contrasts at night. PV facilities require very little lighting, and with good lighting mitigation might cause very low visual contrasts. Parabolic trough facilities require more lighting than PV facilities, and even with good mitigation practices, would cause stronger visual contrasts at night. Although the SLV has numerous lights visible at night, the Antonito Southeast SEZ is located in an area currently devoid of lighting, and the increase in lighting associated with solar facilities would be noticeable.

- **Recovery Time.** Vegetation clearing under collector/reflector arrays (if necessary), and for roads, firebreaks/lanes, etc. would extend for the operating life time of the project, and would recover relatively slowly after decommissioning.
- **Spatial Relationships.** Solar facilities within the SEZs would be observed on the valley floor from a low angle of view. The low forms and generally horizontal lines of the solar developments within the SEZs would be compatible with the horizontal lines of the horizon and low mountain ridges in the existing landscape.
- **Atmospheric Conditions.** Atmospheric haze, smoke, and windblown dust (common in spring months) could reduce visibility of solar facilities within the SEZ.
- **Motion.** The motion of water vapor plumes from parabolic trough facilities utilizing wet cooling or gas boilers could substantially increase facility visibility under certain atmospheric conditions, and particularly when air temperatures are low.

### 3.25.5 Impact Assessment

*Assessment of human use of the VSA and how exposure to solar development within the SEZ could affect the quality of life within the community, tribal land, and/ or recreational experience of the SDAs:* Native Americans may still visit Cerro de la Olla for ritual and traditional purposes and they may see the presence of industrial facilities as visually intrusive. Access to the summit of Cerro de la Olla is difficult, and those who chose to visit the summit might be seeking solitude, or enjoying the dramatic panoramic views of the almost completely natural appearing landscape. Industrial development is inconsistent with the natural-appearing visual character of the surrounding landscape and visitors might find the view of industrial-scale solar facilities unattractive and out of place.

*Summary of impact to casual observer, considering environmental factors, field of view, and other site conditions:* Visitors to Cerro de la Olla would be considered to be sensitive viewers; however, because of the distance to the SEZ, and the low viewing angle, expected visual contrast would be weak. Solar development in the SEZ would be visible to persons at the Cerro de la Olla KOP, but if solar development in the SEZ was limited to PV facilities, their low profile, generally dark color, and lack of visible water vapor plumes would make them unlikely to be noticed by casual observers. An exception would be when glare events occurred and caused bright reflections which might be noticed by casual observers; however, glare events would likely be of short duration. Because PV facilities require minimal lighting during operations, with good mitigation practices they can be nearly invisible at night, and cause very little light pollution.

If solar development in the SEZ included parabolic trough facilities, their typically greater array and building height, increased number of buildings, relatively complex geometry, the possibility of water vapor plumes, increased potential for glare, and higher level of lighting at night makes them substantially more visible than PV facilities. However, given the viewing angle and distance, having parabolic trough facilities in the SEZ would not likely cause moderate levels of visual contrast under normal viewing circumstances for viewers at the Cerro de la Olla KOP.

*Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs:* Solar facilities in the De Tilla Gulch SEZs would not be visible from Cerro de la Olla. Solar development in the Los Mogotes East SEZ is theoretically visible, but because of the very long distance to the SEZ (25-29 mi), the very low angle of view, and screening by vegetation north of the community of Antonito, solar facilities in the Los Mogotes East SEZ would cause negligible visual contrast in the unlikely event that they were visible from Cerro de la Olla, thus cumulative impacts from solar facilities in multiple SEZs would not be expected.

### 3.25.6 Regional Compensatory Mitigation Recommendation

Solar energy development in the Antonito Southeast SEZs might not be noticeable to casual observers on Cerro de la Olla, and would cause weak visual contrasts for viewers in normal viewing conditions. Views in some locations on the lower slopes of Cerro de la Olla would be screened by foreground trees in any event. As a result, regional compensatory mitigation is not recommended as compensation for potential visual impacts that might occur on Cerro de la Olla as a result of solar development in the Antonito Southeast SEZ.

### **3.26 Rio Grande Del Norte National Monument (Representative KOPs: Cumbres & Toltec Scenic Railway Water Tank, San Antonio WSA, San Antonio Mountain WVA, Ute Mountain, Cerro De La Olla)**

#### **3. 26.1 VSA Description**

**VSA Type:** Specially Designated Area

**Potentially Impacting SEZ:** Antonito Southeast SEZ, Los Mogotes East SEZ

**Distance from SEZ to Affected Area within VSA:** The Rio Grande del Norte National Monument (NM) is located 0.1 mi south of the Antonito Southeast SEZ at the point of closest approach. The area of the Rio Grande del Norte NM within the GIS-calculated viewshed of the Antonito Southeast SEZ extends approximately 22.5 mi south of the Rio Grande del Norte NM's northern boundary.

The Rio Grande del Norte National Monument (NM) is located 10.9 mi south of the Los Mogotes East SEZ at the point of closest approach. The area of the Rio Grande del Norte NM within the GIS-calculated viewshed of the Los Mogotes East SEZ extends approximately 20.0 mi south of the Rio Grande del Norte NM's northern boundary.

**Affected Area within the VSA:** Approximately 177,334 ac, or 57% of the Rio Grande del Norte NM is within the viewshed of the Antonito Southeast SEZ. The vast majority of this area is within 15 mi of the SEZ, in the northern portion of the Rio Grande del Norte NM.

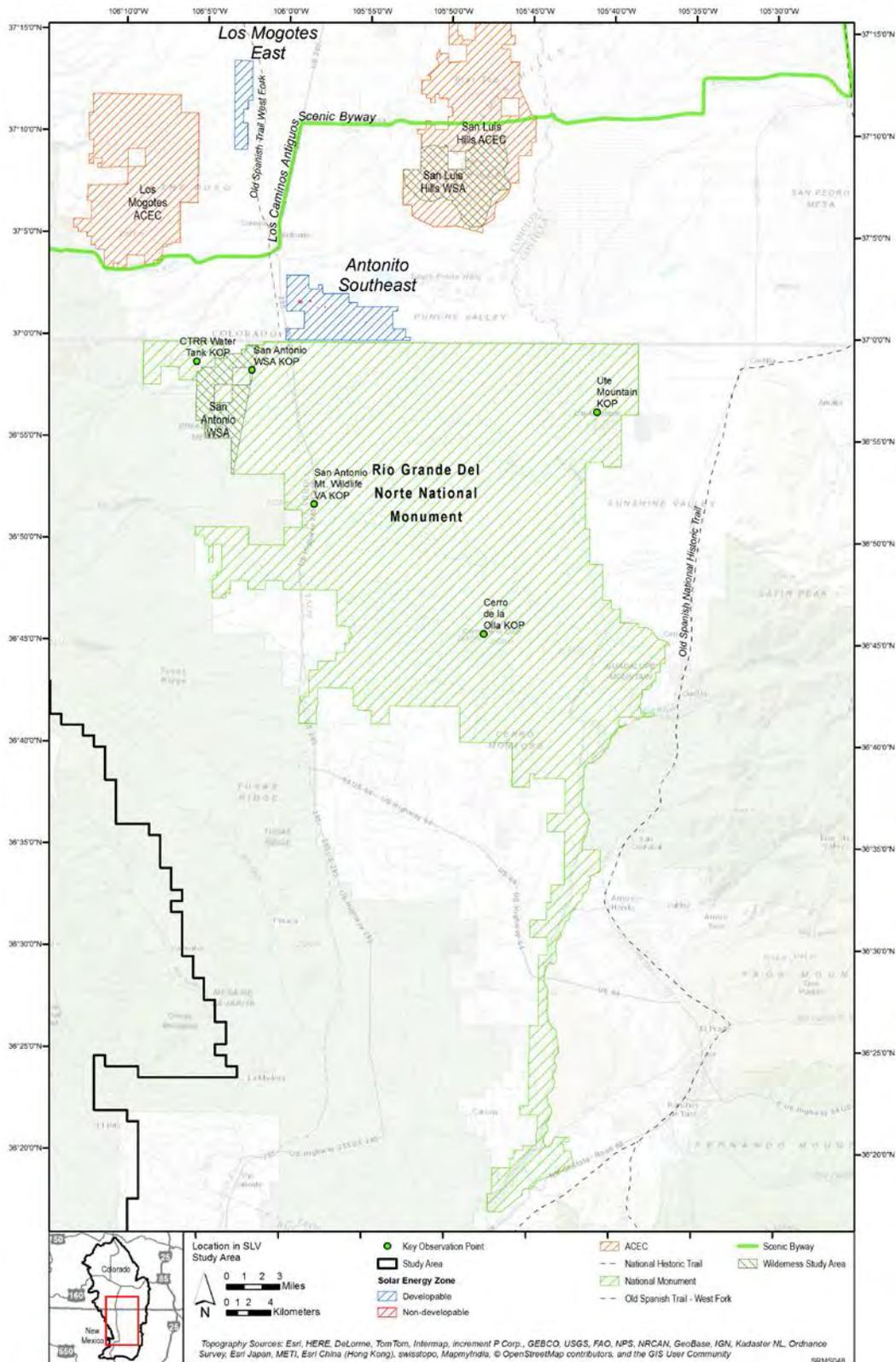
Approximately 28,052 ac, or 9% of the Rio Grande del Norte NM is within the viewshed of the Los Mogotes East SEZ. About half of this area is within 11 – 15 mi from the SEZ, in the northwest corner of the NM, with scattered visibility at higher elevations farther east in the NM, such as Ute Mountain and Cerro de la Olla. It should be noted that for all representative KOPs for the Rio Grande del Norte NM, visual contrasts from solar development in the Los Mogotes SEZ were predicted to be minimal or weak, largely due to screening by vegetation and/or topography, and it would have minimal impacts on the Rio Grande del Norte NM as a whole, thus, the remainder of this discussion will consider impacts from solar development in the Antonito Southeast SEZ only.

**Estimated Annual Visitation/Usage in VSA:** BBC Research and Consulting (2012) estimated annual visitation for the NM area prior to designation of the NM at 325,000 visits/year, and suggests that a substantial increase in annual visitation would likely occur if the NM was designated, which occurred in 2013.

**Types of Activities within the Affected Area:** Driving, boating, hunting, fishing, hiking, camping, horseback riding, wildlife viewing, photography, and other recreation activities (BBC Research and Consulting (2012)).

**Estimated proportion of visitors conducting each major activity type:** A breakdown of users by activity type is not available; however, BBC Research and Consulting (2012) indicated that prior to designation, approximately 19% of the 325,000 estimated annual visits involved non-local day users, 7% camped overnight, and 45% of visitation was by local residents.

**Role of affected area in the management objectives defined within the respective community/ tribal comprehensive land use master plans, or SDA land use plans:** Planning for the new national monument is underway as of this writing. The Rio Grande del Norte NM Resource Management Plan Scoping Report (BLM 2014b) indicates significant public concern for visual resource management issues in the NM, including night skies. Two wilderness areas within the northern portion of the NM have recently been proposed (S.1240, Cerros del Norte Conservation Act, 2015), with the support of BLM (Connell 2013).



**Figure 3.26-1 Rio Grande del Norte NM, Antonito Southeast SEZ, and the Antonito Southeast SEZ Viewshed**

### **3.26.2 Summary of Impacts to KOPs**

#### **3.26.2.1 Introduction**

Five representative KOPs (Cumbres & Toltec Scenic Railway Water Tank, San Antonio WSA, San Antonio WVA, Ute Mountain, and Cerro de la Olla) were used to analyze impacts to the Rio Grande del Norte NM. The basis for deciding if regional compensatory mitigation for visual impacts to the NM is warranted would consider impacts to the representative KOPs and other locations with the NM from which solar facilities in the SEZ would be visible, and the cumulative impacts of sequential or simultaneous views of solar facilities in the SEZs (negligible in this case). Impacts to the Cumbres & Toltec Scenic Railway Water Tank KOP are discussed in detail in Section 3.15.2. Impacts to the San Antonio WSA KOP are discussed in detail in Section 3.23.2. Impacts to the San Antonio WVA KOP are discussed in detail in Section 3.20.2. Impacts to the Ute Mountain KOP are discussed in detail in Section 3.25.2. Impacts to the Cerro de la Olla Mountain KOP are discussed in detail in Section 3.26.2.

#### **3.26.2.2 Summary of Impacts to the Cumbres & Toltec Scenic Railway Water Tank Representative KOP**

This KOP is located at the C&T RR Water Tank, along the C&T RR line in New Mexico, above CR 433, near the community of Los Pinos. Solar development within the Antonito Southeast SEZ would be visible between 5.2 and 12.1 mi from the CT&RR Water Tank KOP. The SEZ is within the BLM background zone of 5-15 mi. The SEZ would cover a substantial portion of the horizontal field of view (38°).

A BLM visual contrast rating was conducted for the C&T RR Water Tank KOP. The overall contrast rating for the Romeo KOP is *Strong*, corresponding most closely to the VRM Class IV objective.

Because they are riding the C&T RR in part for the spectacular views from the train, C&T RR passengers would be considered to be sensitive viewers. As seen from the C&T RR, solar development in the Antonito Southeast SEZ would likely dominate the view. It would appear as multiple blocks or polygons of dark or light color (depending on technology type and lighting) with the blocky and angular forms of buildings visible projecting above it. They would extend across a relatively large portion of the field of view, and directly in front of the Sangre de Cristo Mountains, which are an important scenic element of many views in the SLV. Bright reflections from the solar collector/reflector arrays and other facility components would likely be observed at times, including glare events.

#### **3.26.2.3 Summary of Impacts to the San Antonio WSA Representative KOP**

This KOP is located within the San Antonio WSA, near a two-track road close to the eastern boundary of the northern portion of the WSA. Solar development within the Antonito Southeast SEZ would be visible at a distance of 2.6 mi to 7.0 mi from the KOP. Most of the visible area in the SEZ is in the BLM foreground-middle ground distance zone. The SEZ would cover a substantial portion of the horizontal field of view (51°).

A BLM visual contrast rating was conducted for the San Antonio WSA KOP. The overall contrast rating for the San Antonio WSA KOP is *Strong*, corresponding most closely to the VRM Class IV objective.

Most visitors to the WSA would be considered to be sensitive viewers, and some might be highly sensitive. Solar facilities in the Antonito Southeast SEZ would be plainly visible to visitors and would dominate the view, both because of the short viewing distance involved, and the wide horizontal angle of view that would be occupied by solar facilities.

#### **3.26.2.4 Summary of Impacts to the San Antonio WVA Representative KOP**

The San Antonio Mountain WVA KOP is located on the eastern side of U.S-285 in New Mexico, approximately 9.4 mi south of the Colorado-New Mexico border. Solar development within a small area of the Antonito Southeast SEZ would be visible at a distance of between 9.4 and 11.9 mi from the KOP. The SEZ is within the BLM background zone of 5-15 mi. The SEZ would cover a small portion of the horizontal field of view (8°).

A BLM visual contrast rating was conducted for the San Antonio Mountain WVA KOP. The overall contrast rating for the San Antonio Mountain WVA KOP is *Weak*, corresponding most closely to the VRM Class II objective.

Solar development in the SEZ could be visible to persons at the WVA, but because of the low height of the facilities, the very low angle of view, the screening of most of the SEZ by topography, and the fact that viewer attention is not likely to be focused in the direction of the SEZ, solar facilities in the SEZ would likely be missed by most casual observers.

#### **3.26.2.5 Summary of Impacts to the Ute Mountain Representative KOP**

The Ute Mountain Peak KOP is located on the peak of Ute Mountain in New Mexico, just east of the Rio Grande gorge, approximately 4 mi south of the Colorado-New Mexico border. Solar facilities in the Antonito Southeast SEZ could be visible at distances between 11.3 mi and 19.1 mi from the approximate peak of Ute Mountain. The SEZ is within the BLM background zone of 5-15 mi. The SEZ would cover 16° of the horizontal field of view.

A BLM visual contrast rating was conducted for the Ute Mountain Base KOP, rather than the peak. The overall contrast rating for the Ute Mountain Base KOP is *Moderate*, corresponding most closely to the VRM Class III objective; however, based on this analysis and examination of

Google Earth visualizations, because of better visibility of the SEZ from the elevated viewpoint at the peak, visual contrast for the Ute Mountain Peak KOP were identified as *Strong*, corresponding most closely to the VRM Class IV objective.

Some visitors to Ute Mountain would be considered to be sensitive viewers. Solar facilities in the Antonito Southeast SEZ would likely dominate the view from the upper slopes and near the peak of Ute Mountain, primarily because the elevated viewpoint would substantially increase the apparent size of the SEZ, and make its rectangular and obviously non-natural geometry apparent. The SEZ would contrast strongly in form, line, and color with the surrounding almost completely natural-appearing landscape.

#### **3.26.2.4 Summary of Impacts to the Cerro de la Olla Representative KOP**

The Cerro de la Olla KOP is located at the summit of Cerro de la Olla, approximately 16.4 mi south of the Colorado-New Mexico border. Solar development within the Antonito Southeast SEZ would be visible at a distance of 17.1 mi to 23.1 mi from the Cerro de la Olla KOP. The SEZ is within the BLM seldom seen zone (beyond 15 mi). The SEZ would cover 20° of the horizontal field of view.

A BLM visual contrast rating was conducted for the Cerro de la Olla KOP. The overall contrast rating for the Cerro de la Olla KOP is *Weak*, corresponding most closely to the VRM Class II objective.

Some visitors to Cerro de la Olla would be considered to be sensitive viewers. Solar development in the SEZ could be visible to persons at the summit of Cerro de la Olla, but because of the distance to the SEZ, and the low viewing angle, expected visual contrast would be weak.

#### **3.26.3 Summary of Impacts to Other Locations in the Rio Grande del Norte NM**

Much of the northern portion of the Rio Grande del Norte NM would likely be subject to moderate or strong visual contrasts from solar facilities in the Antonito Southeast SEZ, especially the northwestern portion, which are higher in elevation than the areas closer to the Rio Grande. For northbound travelers on US285, approximately one mile north of the San Antonio Mountain Wildlife Viewing Area, the view of the SEZ opens up dramatically, with strong visual contrasts likely because the entire SEZ is in view, and it would cover much of the horizontal field of view to the northeast. Toward the east, as the land surface slopes down to the Rio Grande, views of solar development in the SEZ are generally partially screened by topography, but the entire SEZ is in view from higher elevations, such as Ute Mountain. Similarly, to the south the land surface slopes downward, and views of solar development in the SEZ are generally partially screened by topography, except at high elevation viewpoints, such as Cerro de

la Olla; however, at these longer distances, the angle of view is low, and the SEZ so distant that it does not constitute a strong source of visual contrast.

#### **3.26.4 Cumulative Visual Impacts of Solar Development Visible in Multiple SEZs**

As noted above, while the Los Mogotes SEZ is technically visible from some portions of the NM, it is generally screened by vegetation and is at best a negligible source of visual contrast. Thus no cumulative impacts from visibility of solar facilities in multiple SEZ are expected.

#### **3.26.5 Regional Compensatory Mitigation Recommendation**

Five representative KOPs were used to analyze impacts to the Rio Grande del Norte NM, and these analyses were supplemented by the analysis of visual contrasts for the remainder of the NM. These analyses show that viewers in the northern portions of the NM, and those at higher elevations in the NM could be subject to moderate or strong visual contrasts from solar development in the Antonito Southeast SEZ. Little other development is visible in the area, and the overall visual impression of the area is of a vast, open plain that is largely natural-appearing, punctuated by dramatic volcanic mountains. The presence of utility-scale solar facilities will create a strong source of visual contrast for travelers on US285, the major travel route through the NM, and also for sensitive viewers on the Cumbres & Toltec Scenic Railway, in the San Antonio WSA, and Ute Mountain, which is an area of cultural importance to tribes, and also recently proposed as a wilderness area, which will increase its visual sensitivity even further.

A relatively large number of people currently visit the Rio Grande del Norte NM, and more visitors are expected over time, because of the NM designation. Not all would be sensitive viewers, but many will be.

In summary, in the northern portions of the NM, large numbers of sensitive viewers on a major travel route or at visually sensitive locations would be exposed to open views of solar facilities in the Antonito Southeast SEZ that would stretch across much of the northern horizon, and would introduce large-scale industrial development into an almost completely natural-appearing landscape. Solar development in the Antonito Southeast SEZ will transform the visual character of this portion of the SLV from a largely natural appearing pastoral landscape to a large-scale industrial development area. As a result, regional compensatory mitigation is recommended as compensation for potential visual impacts that might occur to the Rio Grande del Norte NM as a result of solar development in the Antonito Southeast SEZ.

## 4 SEZ ANALYSIS

The SEZ Analysis analyzed the regional effects of potential visual impacts of solar energy development on three BLM-designated solar energy zones (SEZs) in the San Luis Valley (SLV) in Colorado, and, based on the analysis, made recommendations for or against regional compensatory mitigation to compensate residents and other stakeholders for the potential visual impacts to the SEZs.

### Methodology

Detailed direction and methods specification for the SEZ analysis are contained in Appendix F of the BLM's *Draft Procedural Guidance for Developing Solar Regional Mitigation Strategies* (BLM 2014a). The analysis used BLM visual resource inventory (VRI) and other data on visual resources in the former Saguache and La Jara Field Offices (FOs), now contained within the SLFO, to determine whether the changes in scenic values that would result from the development of utility-scale solar energy facilities in the SEZs would affect the quality and quantity of valued scenic resources in the SLV region as a whole. If the regional effects were judged to be significant, regional compensatory mitigation was recommended. VRI data was not available for the Taos FO and it was not included in the analysis; the analysis includes BLM-administered lands in Colorado only.

Four separate evaluations were conducted as part of the SEZ analysis:

1. The general regional condition and trends of the visual resource within the region (as reflected in the visual resource inventory) were determined, and the changes in visual values for each SEZ were evaluated in the context of the regional condition and trend;
2. The relative scarcity of scenic quality and scenic quality component scores in the region was assessed, and the changes in visual values for each SEZ resulting from solar development were evaluated in the context of the scarcity of scenic quality in the region as a whole;
3. The resilience of the visual resource within the region was identified; and
4. The compatibility of solar development in the SEZs with the land use planning objectives for the SEZ areas, as expressed by the visual resource management classes (VRM classes) identified for the areas, was determined.

A finding that the changes to the visual values for the SEZs, as determined by items 1, 2, or 4, are significant on a regional basis would indicate potential warrant for regional compensatory mitigation, with item 3 (resilience) informing the analysis. Warrant for regional compensatory mitigation was determined for each SEZ separately.

### Results

The results of the SEZ analysis can be summarized as follows:

**Regional visual resource condition and trend:** As shown in Figure 4-1, more than 62% of the inventoried land in the region (more than 1 million acres) has a cultural modification rating <0, while 38% has a cultural modification rating of 0. Thus, almost 2/3 of inventoried lands in the SLV in Colorado have diminished scenic quality because of cultural modifications. Most of the lands are severely impacted, as indicated by cultural modification ratings of -2 or -3. It is important to note that within the mountainous regions of the SLV in Colorado, which are generally excluded from the BLM inventory, cultural modification in many areas is low. This is also generally true for much of the New Mexico portion of the SLV, which was also excluded from the analysis.

The current condition of both BLM and non-BLM lands in the SLV indicates substantial degradation of scenic quality in the region, and the expected trend is toward further development, indicating greater losses to visual resources in the SLV in the future.



**Regional scenic quality scarcity:** As shown in Figure 4-2, within the region, no inventoried lands have a Scenic Quality Rating of “A,” while 34% of inventoried lands have a Scenic Quality Rating of “B,” and 66% have a Scenic Quality Rating of “C.” Thus, high scenic quality is considered very scarce within the inventoried portion of the region, while moderate and low scenic quality is common. It is important to note that within the mountainous regions of the SLV, which are generally excluded from the BLM inventory, scenic quality in many areas is high. This is also generally true for much of the New Mexico portion of the SLV, which was also excluded from the analysis.



**Regional sensitivity scarcity:** As shown in Figure 4-3, within the region, the majority (75%) of inventoried lands was determined to have high sensitivity. A much smaller percentage (6%) has moderate sensitivity, and the remainder (19%) has low sensitivity.

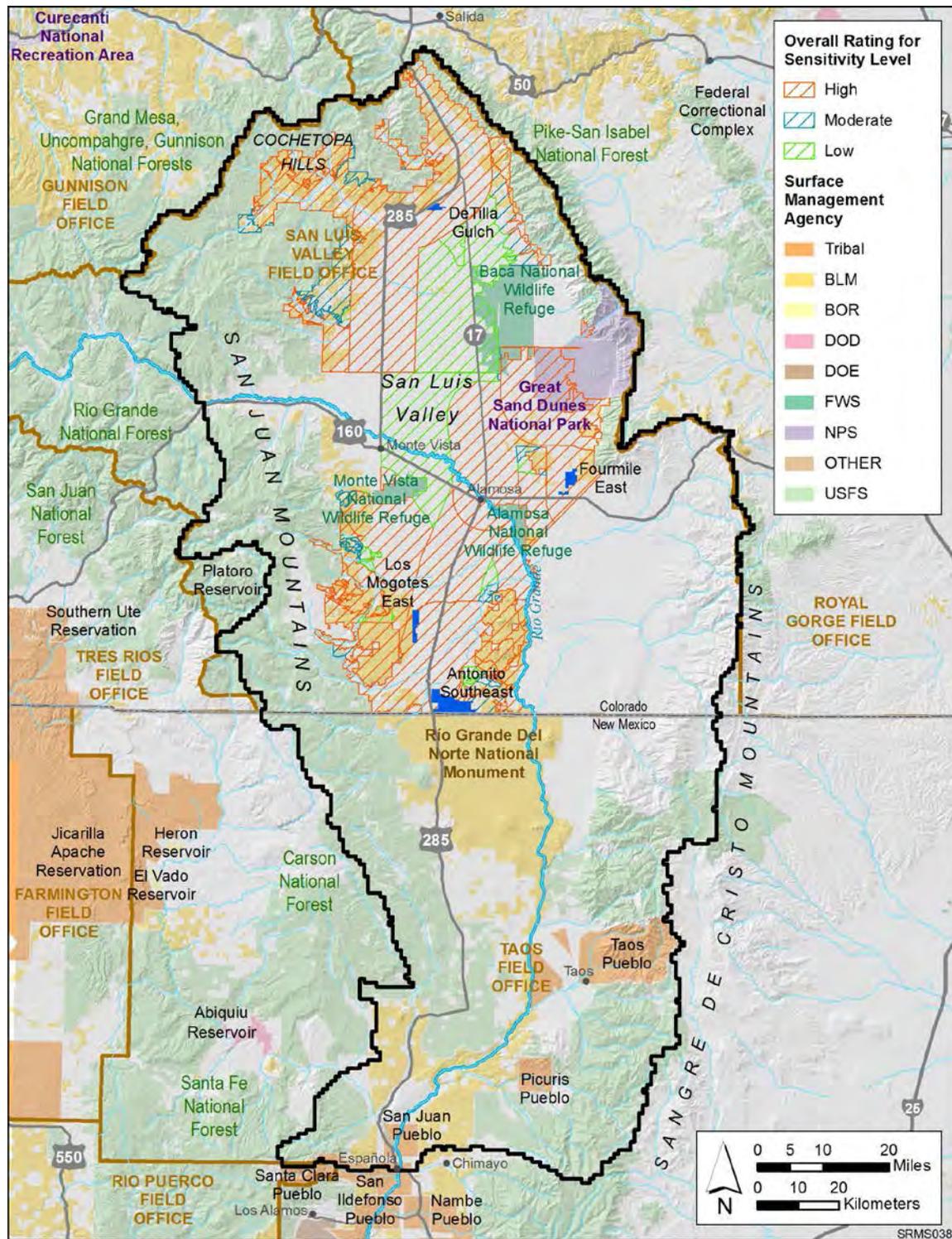


Figure 4-3 BLM VRI Sensitivity Rating for Inventoried Lands in the SLV in Colorado

**Regional distance zone scarcity:** As shown in Figure 4-3, within the region, nearly all inventoried lands (90%) are within the BLM foreground-middleground zone of 0-5 mi. Much smaller areas are within the BLM background distance zone (5-15 mi, 5%) and seldom seen distance zone (beyond 15 mi or not visible, 5%). It should be noted that distance zone analysis is largely confined to BLM-administered lands.



**Resilience:** Based on consultation with Argonne’s ecological resource specialist for the SLV SRMS project, restoration of the SEZ landscapes to an intact appearance after solar facility decommissioning would be difficult. Vegetation in the area recovers slowly, primarily because of low precipitation, typical of desert landscapes. Thus, resilience of the SEZ landscapes is low. Because of the open and treeless nature of the SEZs and their relatively uniform colors and textures, visual absorption capability is also low.

Regional and SEZ-specific analysis results and regional compensatory mitigation recommendations are as follows:

The regional visual resource condition and trend indicates a diminished visual resource supply likely to be diminished further in the future. The poor condition and trend, combined with the low resiliency, results in a higher value being placed on the remaining undisturbed lands, even if they do not have high scenic quality, especially if they have high sensitivity and high visual exposure.

**De Tilla Gulch SEZ:** The De Tilla Gulch is in an area of low scenic quality (Scenic Quality Rating “C”) in an area of high visual sensitivity and in the BLM foreground-middle ground zone, resulting in a VRI Class III assignment, indicating moderate relative visual values. The Scenic Quality cultural modification rating is -0.5, and the Scenic Quality scarcity rating is 1, indicating common landscape features. The VRM Class is III.

Although the De Tilla Gulch SEZ has low scenic quality and does not have scarce landscape features, it is an area with high visual sensitivity only a short distance from a major travel route and because of the low resilience of the landscape (specifically noted in the VRI for this area), the impacts from solar facilities in the SEZ will last well beyond the solar projects’ lifetimes. As per the Solar PEIS, development of multiple solar facilities within the SEZ would normally be considered consistent with VRM Class IV objectives only, i.e., it will dominate the views for likely KOPs. Given that the Saguache FO RMP designated the area as VRM III, this level of development was not foreseen in BLM planning for this area.

In light of the substantial current loss and the likely continued loss of the remaining scenic values of the SLV, as well as the likely non-conformance with the visual management objectives for the De Tilla Gulch SEZ area in the Saguache FO RMP, the changes to visual values of the De Tilla Gulch SEZ are judged to be regionally significant, and regional compensatory mitigation is recommended.

**Los Mogotes East SEZ:** The Los Mogotes East is in an area of low scenic quality in an area of high visual sensitivity and in the BLM foreground-middle ground zone, resulting in a VRI Class III assignment, indicating moderate relative visual values. The Scenic Quality cultural modification rating is 0, and the Scenic Quality scarcity rating is 1, indicating common landscape features. The VRM Class is III.

Similarly to the De Tilla Gulch SEZ, the Los Mogotes East SEZ has low scenic quality and does not have scarce landscape features, but solar development in the SEZ will be a major cultural modification in an area with high visual sensitivity within the foreground-middle ground of a major travel route through the SLV. It will dominate the views for some likely KOPs. Given that the La Jara FO RMP designated the area as VRM III, this level of development was not foreseen in BLM planning for this area.

In light of the substantial current loss and the likely continued loss of the remaining scenic values of the SLV, as well as the likely non-conformance with the visual management objectives for the Los Mogotes East SEZ area in the La Jara FO RMP, the changes to visual values of the Los Mogotes East SEZ are judged to be regionally significant, and regional compensatory mitigation is recommended.

**Antonito Southeast SEZ:** The Antonito Southeast SEZ is in an area of low scenic quality (Scenic Quality Rating “C”) with a very small portion (approximately 140 ac) having moderate scenic quality, in an area of high visual sensitivity and in the BLM foreground-middle ground zone. More than half of the SEZ is assigned to VRI Class III, indicating moderate relative visual values, with most of the remainder assigned to VRI Class IV (indicating low relative visual values), and a very small portion assigned to VRI Class II (indicating high relative visual values). The Scenic Quality cultural modification rating is 0, and the Scenic Quality scarcity rating is 1, indicating common landscape features. The VRM Class is IV for most of the SEZ, but VRM Class III for about 14% of the SEZ along the western and northern boundaries.

The Antonito Southeast SEZ has low scenic quality and does not have scarce landscape features, but solar development in the SEZ will be a major cultural modification in an area with high visual sensitivity immediately adjacent to (and crossing) a major travel route through the SLV. It will dominate the views for many likely KOPs. Given that the La Jara FO RMP designated the area as VRM IV, development of this type was foreseen in BLM planning for most of the SEZ, thus, compensatory mitigation is not warranted on this account. However, in light of the substantial current loss and the likely continued loss of the remaining scenic values of the SLV, the changes to visual values of the Antonito Southeast SEZ are still judged to be regionally significant, and regional compensatory mitigation is recommended.

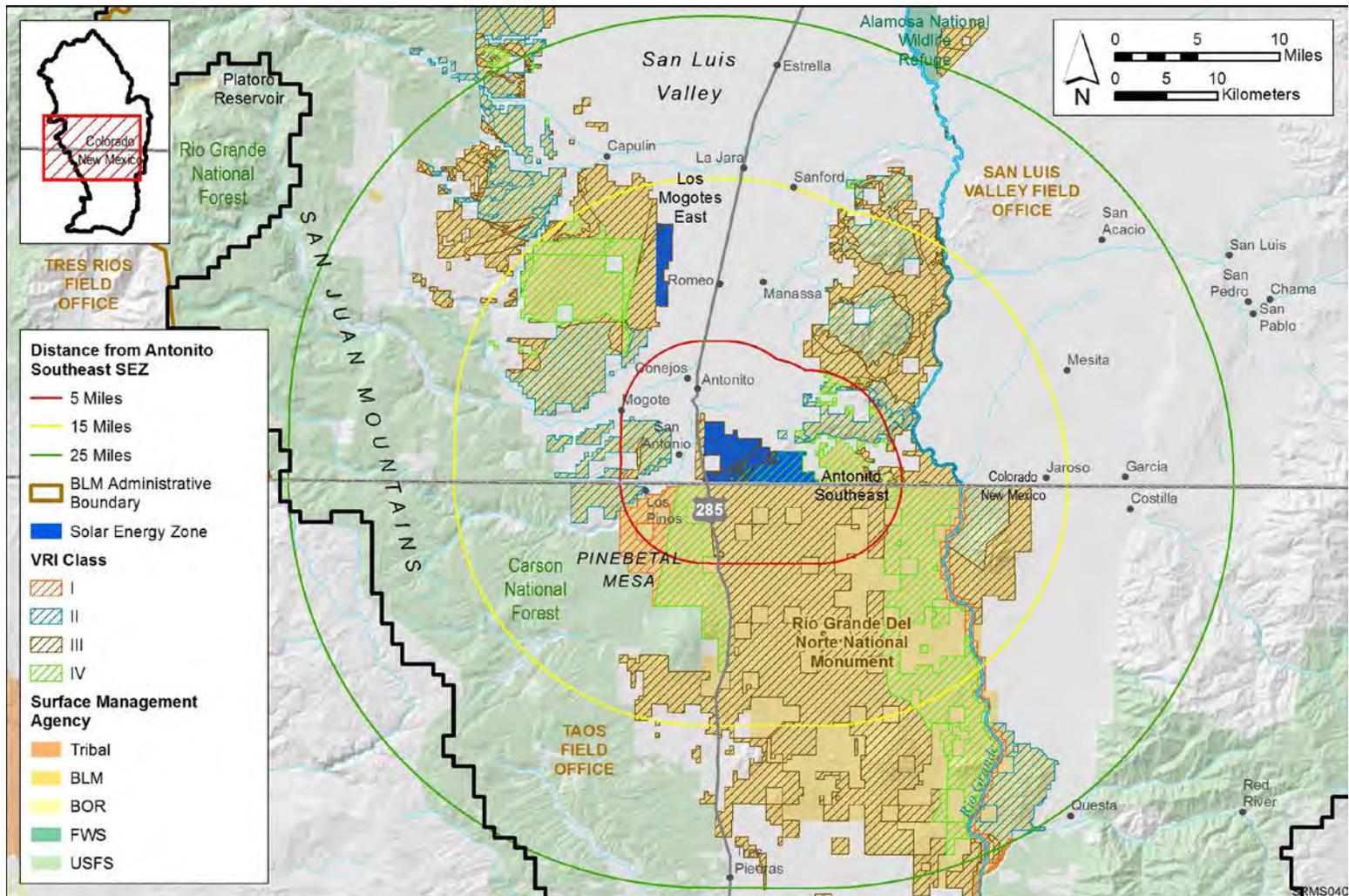


Figure 4-5 BLM VRI Class for the Antonito Southeast SEZ

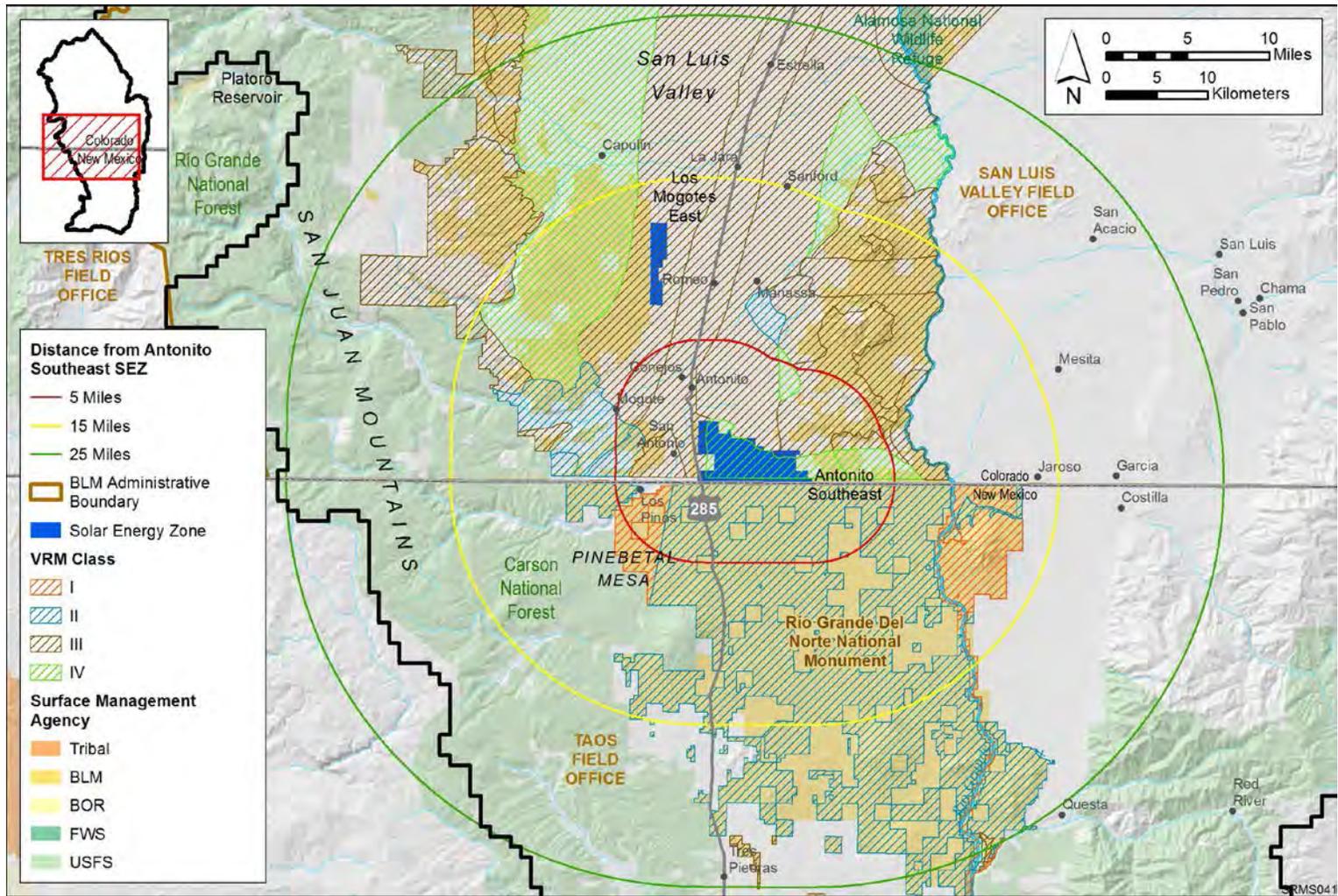


Figure 4-6 BLM VRM Class for the Antonito Southeast SEZ



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**APPENDIX A: VISUAL CONTRAST RATING FORMS FOR VSAs POTENTIALLY  
IMPACTED BY SOLAR ENERGY DEVELOPMENT IN THE SEZs**

**VISUAL CONTRAST RATING FORM FOR DETILLA NORTH KOP**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/14/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch 
2. Key Observation Point <u>KOP #15 De Tilla Wash</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat, ruffled, angular, conical	flat, horizontal	Blocky
LINE	Horizontal, undulating, angular, diagonal, broken	horizontal, undulating, angular, diagonal	vertical, angular,
COLOR	brown, blueish-grey	yellow, greens, tan s	metallic, white
TEXTURE	smooth, rough, medium	medium, coarse	medium, random

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat, grading possibly evident	fine	Blocky buildings angular & rectangular array & buildings, plunks
LINE	horizontal	straight & linear edges of cleared areas fencing & utility edge	vertical & angular vertical plunks
COLOR	no change	tan from clearing	black, grey, blue, silken/white dark grey-green (environmental colors)
TEXTURE	no change	fine where cleared	ordered, regular patterns (PT) rough if bark of PV smooth

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	
ELEMENTS	Form				✓	✓				✓					Evaluator's Names <u>JMA/KGS/JB</u>
	Line				✓	✓				✓				Date <u>8/14/14</u>	
	Color				✓	✓				✓					
	Texture				✓	✓				✓					

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR DETILLA SOUTH KOP**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/14/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>KOP #16 De Tilla South</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling, mixed, angular flat</u>	<u>Flat</u>	<u>largely absent but blocky</u>
LINE	<u>undulating, angular</u>	<u>horizontal banding</u>	<u>—</u>
COLOR	<u>Brown, dark-green, dark-grey, yellow grasses</u>	<u>dark green, yellows, tan, greys</u>	<u>white, black metallic</u>
TEXTURE	<u>Rough - mts. Smooth - valley</u>	<u>coarse fg stippled mts fine slope med - mts patchy mts</u>	<u>Smooth</u>

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Flat - grading possibly evident</u>	<u>fine</u>	<u>blocky buildings. Angular &amp; rectangular array, buildings vertical plume</u>
LINE	<u>horizontal</u>	<u>Straight &amp; linear edge of cleared areas, planting @ facility edge</u>	<u>Strongly horizontal w/1. Shaler vertical &amp; angular lines</u>
COLOR	<u>No change</u>	<u>tan from clearing</u>	<u>BLM environmental colors black to silver-white</u>
TEXTURE	<u>No change</u>	<u>fine where cleared</u>	<u>ordered, regular patterns smooth array</u>

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
ELEMENTS	Form				✓	✓				✓				
	Line				✓	✓				✓				
	Color				✓	✓				✓				
	Texture				✓	✓				✓				
												Evaluator's Names	Date	
												<u>JMA</u> <u>RBS</u> <u>JB</u>	<u>8/14/14</u>	

Rel. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR LIBERTY TRAILHEAD KOP**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**VISUAL CONTRAST RATING WORKSHEET**

Date 8/14/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

**SECTION A. PROJECT INFORMATION**

1. Project Name <u>KOP #18 LTH</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>SRMS</u>		
3. VRM Class		

**SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling hills Rugged, angular, conical mts Flat valley</u>	<u>Round, flat</u>	<u>Blocky</u>
LINE	<u>horizontal valley undulating, angular mts.</u>	<u>Vertical trees broken curving, diagonal tree line slopes</u>	<u>Angular</u>
COLOR	<u>bluish-grey, grey, tan - outcrops</u>	<u>yellow, greens, tans, straw, violet</u>	<u>white</u>
TEXTURE	<u>Smooth valley, dunes rough mts</u>	<u>Medium Fine</u>	<u>Random</u>

**SECTION C. PROPOSED ACTIVITY DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>No change</u>	<u>No change</u>	<u>No change</u>
LINE	<u>No change</u>		<u>horizontal - will fit in</u>
COLOR	<u>No change</u>		<u>grey to silvery-white</u>
TEXTURE	<u>No change</u>		<u>No change</u>

**SECTION D. CONTRAST RATING**  SHORT TERM  LONG TERM

DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form				✓				✓				✓	Evaluator's Names: <u>JMA, RGS, JB</u> Date: <u>8/14/14</u>	
Line				✓				✓				✓		
Color				✓				✓				✓		
Texture				✓				✓				✓		

Rel. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR COMMUNITY OF MOFFAT KOP**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
  
VISUAL CONTRAST RATING WORKSHEET

Date Oct 6, 2014  
District SLV PL  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>Mohat #20</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling hills & mts. Rugged angular mts. Flat valley	rounded - trees	blocky, angular buildings
LINE	horizontal valley undulating mt ridge	<del>horizontal</del> horizontal	vertical - utility poles/signs, build diagonal - buildings
COLOR	gray, pale tan	Med green, tan	gray, white
TEXTURE	medium	coarse, medium, fine	smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	None	cleared for facility	blocky (small) irregular (plume)
LINE		horizontal line, vertical <del>horizontal</del>	horizontal short vertical
COLOR		back to silvery white	back to silvery white buildings would likely blend <i>white to grey plume</i>
TEXTURE		smooth	smooth

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
ELEMENTS	Form					X	X			X	X				
	Line							X					X		
	Color					X				X					
	Texture						X						X		

Evaluator's Names JMA / RBS Date Oct 6, 2014

Ref: 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR VALLEY VIEW HOT SPRINGS/BLACK  
CANYON WSA KOP**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/14/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name SRMS 4. Location \_\_\_\_\_ 5. Location Sketch \_\_\_\_\_  
2. Key Observation Point KOP # 17 Valley View Township \_\_\_\_\_  
3. VRM Class \_\_\_\_\_ Range \_\_\_\_\_  
Section \_\_\_\_\_

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	rolling, rugged, angular, flat, oval	Rounded	Blocky
LINE	horizontal, diagonal, angular, undulating	horizontal curving	vertical, angular
COLOR	greens, tans, dark grey, brown, blue grey	tans, greens	white, red
TEXTURE	smooth valley rough mts	coarse, med-fine - valley stippled, patchy mts	smooth uniform random

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat	No change	No change
LINE	horizontal	No change	thin horizontal band potentially vertical plumes
COLOR	No change	No change	dark grey to silver-white
TEXTURE	No change	No change	No change

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form				✓				✓					✓	Evaluators Names <u>JMA/RBS/JB</u>	Date <u>8/14/14</u>
Line				✓				✓				✓			
Color				✓				✓				✓			
Texture				✓				✓				✓			

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR COMMUNITY OF LA JARA KOP**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

Date: 8/11/14  
District: SLV-PLC  
Resource Area:  
Activity (program):

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name SRMS	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point #1 La Jara		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat valley floor w/ diabert mountain ridge	Rolling grasslands & shrub w/ rugged forested mt. ridges.	Blocky & cylindrical buildings
LINE	Horizontal valley floor & background ridge	short vertical lines trees, veg	vertical lines - buildings diagonal lines - roofs
COLOR	Tan & grey valley floor & dark grey - mt ridge	same as land	grey, white, tan, red
TEXTURE	Medium mt ridge fine to med valley	fine to med trees, grass, lands	smooth, regular corners ordered.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Moving vertical &/or irregular plumes	no change	small blocky add. trees & buildings most of which would be likely screened
LINE	repeating horizontal line of valley floor but will be heavily screened	no change	low horizontal short vertical
COLOR	Bright white of plumes	no change	dark grey to small white likely screened
TEXTURE	no change	no change	regular, smooth

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Explain on reverse side)
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form			✓					✓				✓		Evaluator's Names JMA JB RGS Date 8/11/14
Line			✓					✓				✓		
Color			✓					✓				✓		
Texture			✓					✓				✓		

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR COMMUNITY OF SANFORD KOP**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/11/14  
 District SLV PLC  
 Resource Area \_\_\_\_\_  
 Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>KOP # 2 Sanford</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling grasslands Flat valley floor	conical, rounded trees	Blocky buildings
LINE	Horizontal neckline, level shield valley floor <sup>with ridge</sup>	vertical trees horizontal crops	Angular & diagonal - buildings & roofs
COLOR	tan & bluish-gray	green & tan	white, gray, blue, red, brown, metallic
TEX- TURE	smooth lava field	medium-grasslands coarse-crops <sup>partly sloped</sup>	smooth buildings angled buildings

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	same as existing but vertical/irregular <sup>partly sloped</sup>	NO change	very small, very low inclined rectangular
LINE	repeating line (horizontal) of valley floor		very low horizontal & low vertical
COLOR	Bright whites of plumes		dark gray to silver white
TEX- TURE	NO change		regular, smooth

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None			
Form																Evaluator's Names _____ Date _____
Line			✓													
Color			✓													
Texture				✓												

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR COMMUNITY OF ROMEO KOP (ALSO REPRESENTATIVE KOP FOR LOS CAMINOS ANTIGUOS SCENIC AND HISTORIC BYWAY, AND U.S. HIGHWAY 285, AND CRITICAL KOP FOR VETERANS' MEMORIAL)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/11/14  
District SLV-FLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>KOP #4 Former</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling ridge line Flat valley</u>	<u>Ranked trees</u>	<u>Cylindrical silos Angular/blocky buildings</u>
LINE	<u>Horizontal - valley floor path</u>	<u>Vertical trees horizontal crops, veg.</u>	<u>Angular/diagonal buildings</u>
COLOR	<u>green - valley floor brown/tan grey mts.</u>	<u>green crops, trees</u>	<u>Brown, white, metallic, orange</u>
TEXTURE	<u>Smooth - flat shield Rough - mts to NW</u>	<u>coarse, med. fine patchy in mts</u>	<u>smooth, ordered</u>

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Vertical 4 or irregular plumbers</u>	<u>NONE</u>	<u>Very small, very low irregular rectangular</u>
LINE	<u>Horizontal line of valley floor</u>		<u>Very low horizontal &amp; vertical</u>
COLOR	<u>Dark whites of plumbers</u>		<u>dark grey to silvery white</u>
TEXTURE	<u>None</u>		<u>regular, smooth</u>

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
Form				✓													Evaluator's Names <u>KBS</u> <u>JB</u> <u>JMM</u> Date <u>8/11/14</u>
Line		✓															
Color		✓															
Texture			✓														

+ potentially strong w/ glare

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR COMMUNITY OF MANASSA KOP (ALSO  
REPRESENTATIVE KOP FOR LOS CAMINOS ANTIGUOS SCENIC AND HISTORIC  
BYWAY)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

Date 8/11/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>#3 - Marassa city limits</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling Mt. slopes of lava shield rounded mt. & flat valley floor	Central - trees Panda shrubs & trees	Blocky angular buildings
LINE	horizontal valley, lava shield ridge undulating ridge top	vertical - trees horizontal - vegetation	Angular & diagonal & vertical buildings
COLOR	green - valley floor lava shield brown - dark grey	greens yans browns	brown, metallic, silver, white, grey, red
TEXTURE	lava shield - smooth	coarse, medium, fine	smooth & ordered

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	vertical and/or irregular plumes	NO change	very small, very low indistinct rectangular
LINE	irregular line of valley floor		very low horizontal & vertical
COLOR	Bright white of plumes		dark grey to silver-white
TEXTURE	NONE		regular, smooth

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

I. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)			
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)								
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None					
ELEMENTS	Form			✓				✓				✓					
	Line		✓					✓				✓					
	Color		✓					✓				✓					
	Texture			✓				✓				✓					

Evaluator's Names JNA RGS JB Date 8/11/14

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR SAN LUIS HILLS ACEC  
(REPRESENTATIVE KOPs: FLAT TOP HIGHPOINT, PIÑON HILLS HIGHPOINT,  
JOHN JAMES CANYON TRAILHEAD)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**VISUAL CONTRAST RATING WORKSHEET**

Date 04 7, 2014  
District SN-PL  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

**SECTION A. PROJECT INFORMATION**

1. Project Name SRMS 4. Location Township \_\_\_\_\_ Range \_\_\_\_\_ Section \_\_\_\_\_  
2. Key Observation Point Flat top #22 5. Location Sketch Both obs points # Antares SEZ  
3. VRM Class \_\_\_\_\_

**SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling, rugged, angular rounded mts flat valley brushwood</u>	<u>flat</u>	<u>Blocky</u>
LINE	<u>horizontal valley floor undulating in small</u>	<u>broken tree lines</u>	<u>Angular</u>
COLOR	<u>dark grey, reddish black white</u>	<u>tan, greens, grey black</u>	<u>white silvery white</u>
TEXTURE	<u>smooth but shield of valley floor rough mts</u>	<u>coarse, med, fine patchy</u>	<u>Random</u>

**SECTION C. PROPOSED ACTIVITY DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>None</u>	<u>rectangular cleared areas</u>	<u>blocky rectangle</u>
LINE	<u>↓</u>	<u>big horizontal strip diagonal</u>	<u>Angular, horizontal</u>
COLOR		<u>tan, dark grey to silvery white</u>	<u>dark grey to silvery white</u>
TEXTURE		<u>smooth</u>	<u>smooth</u>

**SECTION D. CONTRAST RATING**  SHORT TERM  LONG TERM

I. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form													Evaluator's Names <u>JMA / RBS</u>	Date <u>10/7/14</u>
Line														
Color														
Texture														

Ref. 8-30  
1/17/86

Form #400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/15/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>KOP # 19 Pinnac Hills HP</u>		
3. VRM Class <u>SLV WSA</u>		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling, angular, rounded mts flat valley hills</u>	<u>rounded trees oval - ciperules</u>	—
LINE	<u>horizontal, - valley irregular, irregular - mts</u>	<u>horizontal, bands,</u>	<u>straight roads</u>
COLOR	<u>charcoal grey, blue grey, browns, tans, greens</u>	<u>greens, tans, yellow</u>	<u>white, red, metallic</u>
TEXTURE	<u>smooth valley, rock mts rough rocks</u>	<u>coarse, med. fine, patchy stippled</u>	<u>smooth</u>

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>LM - no change MT - no change</u>	<u>LM - Angular patches MT - Angular patches</u>	<u>LM - elongated rectangles MT - oblique, angular polygons</u>
LINE	<u>LM - no change MT - no change</u>	<u>LM - angular (sharp) MT - angular</u>	<u>LM - horizontal band MT - pronounced angular</u>
COLOR	<u>LM - No change MT - No change</u>	<u>LM - tan, frame bearing MT - tan, frame bearing</u>	<u>LM - black to silver, white MT - brown - bluish-grey</u>
TEXTURE	<u>LM - No change MT - No change</u>	<u>LM - fine MT - fine</u>	<u>LM - smooth, patterned MT - smooth, patterned</u>

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

1.	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
ELEMENTS	Form				✓	A	LM			P	LM			
	Line				✓	A	LM			A	LM			
	Color				✓	A	LM			A	LM			
	Texture				✓		LM				LM			

Ref. 8-30  
1/17/86

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/13/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name SRMS 4. Location \_\_\_\_\_ 5. Location Sketch \_\_\_\_\_  
Township \_\_\_\_\_  
2. Key Observation Point Loc #13 in James TH Range \_\_\_\_\_  
3. VRM Class \_\_\_\_\_ Section \_\_\_\_\_

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling, Angular, Flat	conical, rounded, flat	Blocky
LINE	Horizontal, undulating, angular, diagonal	vertical, horizontal	Angular
COLOR	dark brown, blue-grey, tan	yellow, green, tan	white, metallic
TEXTURE	Smooth, rough	coarse, med, fine, patchy, stippled	uniform, ordered

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat	Flat	Flat w/ projecting blocky buildings & vertical planes
LINE	micro horizontal band	thin horizontal & angular from clearing	Angular & horizontal thin roads or facilities
COLOR	no change	tan from clearing	black to silvery white
TEXTURE	no change	fine	smooth w/ ordered patterns

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
Form				✓													Evaluator's Names <u>JMA, RBS, JB</u> Date <u>8/13/14</u>
Line				✓													
Color				✓						✓							
Texture				✓													

Rel. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR LOS MOGOTES PEAKS KOP**

Form B400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/12/14  
District BLM- PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name SRMS 4. Location \_\_\_\_\_ 5. Location Sketch \_\_\_\_\_  
Township \_\_\_\_\_  
2. Key Observation Point KOP # 7 Saw Woods Peak Range \_\_\_\_\_  
3. VRM Class \_\_\_\_\_ Section \_\_\_\_\_

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling, Blocky, flat Rounded, Angular, Rounded conical</u>	<u>Rounded</u>	<u>Angular</u>
LINE	<u>Horizontal, undulating, Angular, diagonal, broken</u>	<u>curving</u>	<u>Angular</u>
COLOR	<u>Green, brown, grey</u>	<u>Greens, tans, browns</u>	<u>Red, white, grey</u>
TEXTURE	<u>Smooth, medium</u>	<u>coarse, medium, fine</u>	<u>Rarely, ordered</u>

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>polygons in an irregular pattern</u>	<u>cleared lines &amp; polygons</u>	<u>low rectangular, angular, geometric</u>
LINE	<u>horizontal angular</u>	<u>straight lines &amp; angular</u>	<u>vertical &amp; horizontal angular, geometric</u>
COLOR	<u>tan &amp; grey</u>	<u>tan</u>	<u>black - silver white grey, blue</u>
TEXTURE	<u>smooth, patchy</u>	<u>fine</u>	<u>smooth, uniform ordered</u>

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form			✓	✓						✓				Evaluator's Names <u>JMA, RGS, JB</u> Date <u>8/12/14</u>
Line			✓	✓					✓					
Color	✓				✓				✓					
Texture			✓			✓					✓			

Ref. 8-30  
1/17/86

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/12/14  
District BLM-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>JRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>#8 Jossingtons Park 2</u>		
3. VRM Class <u>J</u>		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling, Rugged, Angular, Flat</u>	<u>conical, rounded</u>	<u>Blocky</u>
LINE	<u>horizontal, undulating, angular, diagonal</u>	<u>Vertical</u>	<u>Angular</u>
COLOR	<u>Greens, tans, bluish-grey</u>	<u>greens, tans</u>	<u>white, metallic</u>
TEXTURE	<u>smooth, rough</u>	<u>coarse, med. fine, patchy</u>	<u>uniform, ordered</u>

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>polygons in an irregular pattern</u>	<u>cleared lines &amp; polygons</u>	<u>low rectangular, angular, geometric</u>
LINE	<u>horizontal, angular</u>	<u>straight lines &amp; angular</u>	<u>Vertical &amp; horizontal, angular, geometric</u>
COLOR	<u>tan &amp; grey</u>	<u>tan</u>	<u>black, silty, white, grey, blue</u>
TEXTURE	<u>smooth, patchy</u>	<u>fine</u>	<u>Smooth, uniform, ordered</u>

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

I. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
ELEMENTS													Evaluator's Names <u>JMA, RGS, JB</u>	Date <u>8/11/14</u>
Form			✓				✓				✓			
Line			✓				✓				✓			
Color	✓					✓				✓				
Texture			✓			✓					✓			

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR COMMUNITY OF ANTONITO KOP  
(ALSO CRITICAL KOP FOR CUMBRES & TOLTEC SCENIC RAILWAY, AND  
REPRESENTATIVE KOP FOR LOS CAMINOS ANTIGUOS SCENIC AND HISTORIC  
BYWAY)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**VISUAL CONTRAST RATING WORKSHEET**

Date 8/11/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

**SECTION A. PROJECT INFORMATION**

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>Kop Co Antonio/Chs Antiguos</u>		
3. VRM Class <u>J</u>		

**SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling, Rugged Dip-sloped Flat</u>	<u>flat, rounded</u>	<u>rolling, blocky angular cylindrical</u>
LINE	<u>horizontal Angular, diagonal</u>	<u>undulating</u>	<u>vertical, horizontal angular, diagonal</u>
COLOR	<u>Brown, green, rust, dusty grey</u>	<u>greens &amp; tans</u>	<u>Dark brown-grey, white, ferruginous blue</u>
TEXTURE	<u>fine, coarse</u>	<u>coarse, fine, medium</u>	<u>smooth, ordered</u>

**SECTION C. PROPOSED ACTIVITY DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>flat</u>	<u>small cleared areas</u>	<u>thin rectangles</u>
LINE	<u>narrow band horizontal</u>	<u>horizontal</u>	<u>mostly horizontal</u>
COLOR	<u>light tans &amp; greys</u>	<u>greens &amp; tans</u>	<u>dark grey-silvery white</u>
TEXTURE	<u>smooth</u>	<u>fine</u>	<u>smooth &amp; crested</u>

**SECTION D. CONTRAST RATING**  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
Form																Evaluator's Names <u>JMA, RGS, JB</u>	Date <u>8/11/14</u>
Line			✓				✓					✓					
Color			✓				✓					✓					
Texture			✓				✓					✓					

LH PT

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR CUMBRES & TOLTEC SCENIC  
RAILWAY KOP (REPRESENTATIVE KOPs: CUMBRES & TOLTEC SCENIC  
RAILWAY WATER TANK, CUMBRES & TOLTEC SCENIC RAILWAY DEPOT)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
  
VISUAL CONTRAST RATING WORKSHEET

Date 8/12/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>#9 C&amp;TRR</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rugged, Flat, Angular conical	Rounded	Blocky
LINE	undulating, horizontal Angular, diagonal	Vertical, curving	curving <del>blocky</del> Angular
COLOR	Brown, tan, blue-grey	yellow, green tans	white, grey
TEXTURE	Rough smooth	coarse, fine, med	uniform ordered

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Band	cleared lines & rows	low rectangular, angular geometric
LINE	horizontal angular	stray # & angular	vertical, horizontal, angular, geometric
COLOR	tan & grey	tan	black-grey-blue silver, white
TEXTURE	smooth & patchy	fine	smooth, uniform ordered

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
Form				✓													Evaluator's Names <u>JMA, RBS, JB</u> Date <u>8/12/14</u>
Line			✓														
Color		✓				✓					✓						
Texture			✓				✓						✓				

Ref: 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR WEST FORK OF THE NORTH BRANCH  
OF THE OST (REPRESENTATIVE KOPS: WEST FORK OF THE NORTH BRANCH  
OF THE OST, STATELINE)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/11/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name SRMS 4. Location \_\_\_\_\_  
2. Key Observation Point #5 West NF OST Township \_\_\_\_\_  
3. VRM Class \_\_\_\_\_ Range \_\_\_\_\_  
Section \_\_\_\_\_

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling lava shield ridge Rugged mts & peaks flat valley floor	Rounded trees	Angular & blocky buildings
LINE	horizontal - valley lava shield undulating mt. ridge dip-slopes	curving trees vertical trees	Angular polygonal buildings
COLOR	Blueish grey - mt brown - mt green - valley/lava shield	green & tan - trees shrub, scrub	Brown, white, metallic
TEXTURE	smooth lava shield valley	coarse, med. fine patchy	uniform ordered

dip-slopes

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	flat	cleared rectangular - farms for roads & arrays	low rectangular collector sheds, rectangular buildings
LINE	horizontal & vertical arrays & access roads	strong horizontal & vertical lines & curving & interlocking - facilities	vertical, horizontal, angular, diagonal
COLOR	light tans & greys	greens & tans	black to silver/white
TEXTURE	Alternating mottled pattern	fine	smooth & patterned

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
Form				✓												Evaluator's Names <u>JMA, JBS, JB</u>	Date <u>8/11/14</u>
Line		✓			✓												
Color		✓			✓					✓							
Texture		✓				✓					✓						

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR “WELCOME TO COLORFUL  
COLORADO” STATE LINE SIGN KOP (ALSO REPRESENTATIVE KOP FOR U.S.  
285 AND WEST FORK, NORTH BRANCH OF THE OLD SPANISH TRAIL)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

Date 8/12/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>#10 CO/NM Setback</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rolling, Rugged, Angular, Concave, Flat</u>	<u>Round</u>	<u>Blocky</u>
LINE	<u>horizontal, Angular, Diagonal, curving</u>	<u>curving</u>	<u>Angular, vertical</u>
COLOR	<u>tan, brown, blue-grey</u>	<u>Green, tan, yellow, brown</u>	<u>white, brown, metallic</u>
TEXTURE	<u>Smooth, rough</u>	<u>coarse, med, fine, patchy</u>	<u>abstract uniform</u>

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Flat from grading</u>	<u>Flat</u>	<u>Angular, flat, geometric, blocky, rectangular</u>
LINE	<u>horizontal</u>	<u>horizontal</u>	<u>diagonal, strong, slightly horizontal</u>
COLOR	<u>tan</u>	<u>tan</u>	<u>black, bluish-grey, silver-white, metallic</u>
TEXTURE	<u>smooth</u>	<u>fine</u>	<u>smooth, regular, patterned</u>

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
Form			✓													Evaluator's Names <u>JMA</u> <u>KBS</u> <u>JB</u>	Date <u>8/12/14</u>
Line				✓													
Color		✓				✓				✓							
Texture		✓				✓							✓				

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR SAN ANTONIO MOUNTAIN WILDLIFE  
VIEWING AREA KOP (ALSO REPRESENTATIVE KOP FOR U.S. 285 AND RIO  
GRANDE DEL NORTE NATIONAL MONUMENT)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/14/13  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch
2. Key Observation Point <u>KOP # 11 - SALVADORA UA</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling, rugged, angular, convex, flat, rounded	flat	blocky
LINE	horizontal, curving, undulating, angular	Broken, horizontal	vertical
COLOR	dark brown, silver, blue grey	green, tan, yellow	metallic, dark brown
TEXTURE	smooth & rough	rause, med. fine, shepded, patchy	smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	flat	flat	flat
LINE	thin, horizontal	thin	horizontal, thin, vertical (plume)
COLOR	tan	tan	grey to silver, white
TEXTURE	smooth	fine	smooth

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)		
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)							
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None				
Form																Evaluator's Names <u>JMA</u> <u>RBS</u> <u>JB</u>	Date <u>8/14/13</u>
Line			✓				✓				✓						
Color			✓				✓				✓						
Texture			✓				✓				✓						

Rel. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR SAN ANTONIO WSA KOP (ALSO  
REPRESENTATIVE KOP FOR RIO GRANDE DEL NORTE NATIONAL  
MONUMENT)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 8/13/14  
District SLV-PLC  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name <u>SRMS</u>	4. Location Township _____ Range _____ Section _____	5. Location Sketch 
2. Key Observation Point <u>KCP # 12 SJUWA</u>		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling, rugged, angular, concave, rounded, flat	flat	blocky
LINE	horizontal, angular, curving, undulating, diagonal	horizontal	vertical, horizontal
COLOR	tan, brown, blue grey	yellow, green, tan	turquoise white
TEXTURE	smooth, rough	coarse, med, fine	(uniform) ordered

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	flat	flat	flat w/ projecting blocks blocky elements
LINE	horizontal (thin)	thin horizontal	generally horizontal w/ short vertical
COLOR	grey	tan where cleared	dark grey to silty white
TEXTURE	none	fine	orderly pattern

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

1. DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
ELEMENTS	Form												
	Line		✓			✓				✓			
	Color		✓			✓			✓				
	Texture			✓			✓		✓				

Ref. 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR UTE MOUNTAIN KOP (ALSO  
REPRESENTATIVE KOP FOR RIO GRANDE DEL NORTE NATIONAL  
MONUMENT)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 10/9/14  
District SLV-PL  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

SECTION A. PROJECT INFORMATION

1. Project Name SRMS 4. Location \_\_\_\_\_ 5. Location Sketch \_\_\_\_\_  
Township \_\_\_\_\_  
2. Key Observation Point Near Old Mt #24 Range \_\_\_\_\_  
3. VRM Class Antonio SEZ Section \_\_\_\_\_

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>Rounded, angular mts, Flat valley rolling hills</u>	<u>flat</u>	<u>none</u>
LINE	<u>horizontal - valley, some rolling hills, broken gage, undulating hills &amp; mts</u>	<u>horizontal</u>	<u>none</u>
COLOR	<u>grey &amp; dark grey, brown &amp; black</u>	<u>tan, light green, green</u>	<u>none</u>
TEXTURE	<u>smooth valley, hills, rough mts, gage</u>	<u>coarse, <del>no</del> med, fine</u>	<u>None</u>

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>None</u>	<u>cleared</u>	<u>blocky, angular</u>
LINE	<u>↓</u>	<u>horizontal-thin band</u>	<u>horizontal, show vertical lines</u>
COLOR	<u>↓</u>	<u>tan or grey</u>	<u>black to silvery grey</u>
TEXTURE	<u>↓</u>	<u>smooth</u>	<u>smooth</u>

SECTION D. CONTRAST RATING  SHORT TERM  LONG TERM

DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)						
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None			
Form				<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>	Evaluator's Names <u>JMA / RGS</u>	Date <u>10/9/14</u>
Line				<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>		
Color				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		
Texture				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>		

Revised 8-30  
1/17/86

**VISUAL CONTRAST RATING FORM FOR CERRO DE LA OLLA KOP (ALSO  
REPRESENTATIVE KOP FOR RIO GRANDE DEL NORTE NATIONAL  
MONUMENT)**

Form 8400-4  
(September 1985)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**VISUAL CONTRAST RATING WORKSHEET**

Date Oct 7, 2014  
District SLVA  
Resource Area \_\_\_\_\_  
Activity (program) \_\_\_\_\_

**SECTION A. PROJECT INFORMATION**

1. Project Name SRMS 4. Location \_\_\_\_\_ 5. Location Sketch \_\_\_\_\_  
2. Key Observation Point Cerro de la Olla #01 Township \_\_\_\_\_  
3. VRM Class \_\_\_\_\_ Range \_\_\_\_\_  
Section \_\_\_\_\_

**SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling hills Rugged mts Angular mts Flat valley	flat	long shaped ponds, corrals
LINE	horizontal valley curving, undulating, angular, diagonal mts. irregular contours	Broken tree lines vertical trees	vertical roads
COLOR	Brown, tan, grey mts.	greens, tans, golds, orange shrubs & grass	silvery grey holding ponds white buildings
TEXTURE	smooth valley rough mts	coarse, fine, med patchy	smooth ponds

**SECTION C. PROPOSED ACTIVITY DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	<u>None</u>	cleared in a thin line adj to dark veg. - no change	small blocks - very small
LINE		cleared in a thin line	thin horizontal
COLOR		dark grey to silvery grey	dark grey to silvery grey
TEXTURE		smooth	smooth

**SECTION D. CONTRAST RATING**  SHORT TERM  LONG TERM

ELEMENTS	DEGREE OF CONTRAST	FEATURES												2. Does project design meet visual resource management objectives? <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)	3. Additional mitigating measures recommended <input type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverse side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form				X				X				X			Evaluator's Names <u>JMA / RGS</u> Date <u>10/7/14</u>
Line				X			X				X				
Color				X			X				X				
Texture				X			X				X				

Ref. 8-30  
1/17/86

**APPENDIX B: VISUAL CONTRAST RATING DEGREE OF CONTRAST CRITERIA  
AND ENVIRONMENTAL FACTORS DESCRIPTIONS**

<b>Degree of Contrast</b>	<b>Criteria</b>
<b>None</b>	The element contrast is not visible or perceived.
<b>Weak</b>	The element contrast can be seen but does not attract attention.
<b>Moderate</b>	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
<b>Strong</b>	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

Consider the following factors when applying the criteria:

- (1) **Distance.** The contrast created by a project usually is less as viewing distance increases.
- (2) **Angle of Observation.** The apparent size of a project is directly related to the angle between the viewer's line-of-sight and the slope upon which the project is to take place. As this angle nears 90 degrees (vertical and horizontal), the maximum area is viewable.
- (3) **Length of Time the Project Is In View.** If the viewer has only a brief glimpse of the project, the contrast may not be of great concern. If, however, the project is subject to view for a long period, as from an overlook, the contrast may be very significant.
- (4) **Relative Size or Scale.** The contrast created by the project is directly related to its size and scale as compared to the surroundings in which it is place (see Illustration 7).
- (5) **Season of Use.** Contrast ratings should consider the physical conditions that exist during the heaviest or most critical visitor use season, such as snow cover and tree defoliation during the winter, leaf color in the fall, and lush vegetation and flowering in the spring.
- (6) **Light Conditions.** The amount of contrast can be substantially affected by the light conditions. The direction and angle of lighting can affect color intensity, reflection, shadow, form, texture, and many other visual aspects of the landscape. Light conditions during heavy periods must be a consideration in contrast ratings.
- (7) **Recovery Time.** The amount of time required for successful revegetation should be considered. Few projects meet the VRM management objectives during construction activities. Recovery usually takes several years and goes through several phases (e.g., bare ground to grasses, to shrubs, to trees, etc.). It may be necessary to conduct contrast ratings for each of the phases that extend over long time periods. Those conducting contrast rating should verify the probability and timing of vegetative recovery.
- (8) **Spatial Relationships.** The spatial relationship within a landscape is a major factor in determining the degree of contrast (see Illustration 8).

- (9) **Atmospheric Conditions.** The visibility of projects due to atmospheric conditions such as air pollution or natural haze should be considered.
- (10) **Motion.** Movement such as waterfalls, vehicles, or plumes draws attention to a project.

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**APPENDIX C: ADDITIONAL INFORMAL VISUAL RESOURCE CONSIDERATIONS  
FOR POTENTIAL SOLAR DEVELOPMENT IN THE SAN LUIS VALLEY OF  
COLORADO**

## INTRODUCTION

Solar energy production by the construction and operation of utility-scale solar energy facilities will introduce major visual changes into the rural landscapes of south central Colorado. Solar facilities are expected to attract attention and may dominate views especially at short distances. Impacts at longer distances could still be substantial, depending on project size and type, viewer location, and other visibility factors.

Mitigation measures would reduce contrasts somewhat; however, in many cases, the contrasts from the solar collector/reflector arrays, combined with the large size of the facilities, and at times, strong reflections or glare from reflective surfaces, could not be mitigated effectively.

Sensitive visual resource areas close to the major facility components with open lines of sight to the facilities could be subject to large impacts from the visual contrasts that would result. Beyond the impacts of a single solar facility, in some locations, viewscapes could include multiple projects with large solar arrays. Depending on the circumstances, the variety of project sizes and layouts could result in “visual clutter” that would detract from the scenic qualities of the viewed landscape.

As part of the Solar Regional Mitigation Strategy (SRMS) planning effort, detailed analysis of the impacts to potentially sensitive visual resources likely to have views of solar energy projects within the BLM-designated solar energy zones was conducted using the guidelines of the 1984 BLM Visual Resource Management Program Manual (BLM, 1984) and processes developed for the Solar Energy Development Programmatic EIS (BLM-DOE, 2012).

A series of Key Observation Points (KOPS) were identified and the view from each KOP was recorded and analyzed in detail to estimate the impact to the scenic value of the landscape. These KOPS had been identified as being sensitive visually sensitive areas such as those where people gather (churches, residential neighborhoods, small towns), recreational use areas (trail heads, memorials, scenic byways) minority traditional use areas and other selected locations.

However, once the original KOPS were selected and analyzed, it was decided that it would be prudent to look at other areas to at least determine a baseline for potential adverse visual impacts to a broader range of viewers. The additional analysis would also help the BLM to develop possible mitigation measures to offset the adverse impacts to these viewing areas.

The Antonito area has a rich cultural heritage and history, as well as a significant minority population, and the Crestone area has a number of religious shrines or retreats, a college, visitor accommodations as well as numerous private homes and tourism related businesses. Both areas have viewers who may consider a solar development to be a detrimental change in the scenic quality of the area. Photo documentation and short descriptions of the additional informal observations are included in this appendix (see below) and it is hoped that this information will demonstrate that the BLM has considered potential impacts to the scenic values in the areas where solar development may occur.

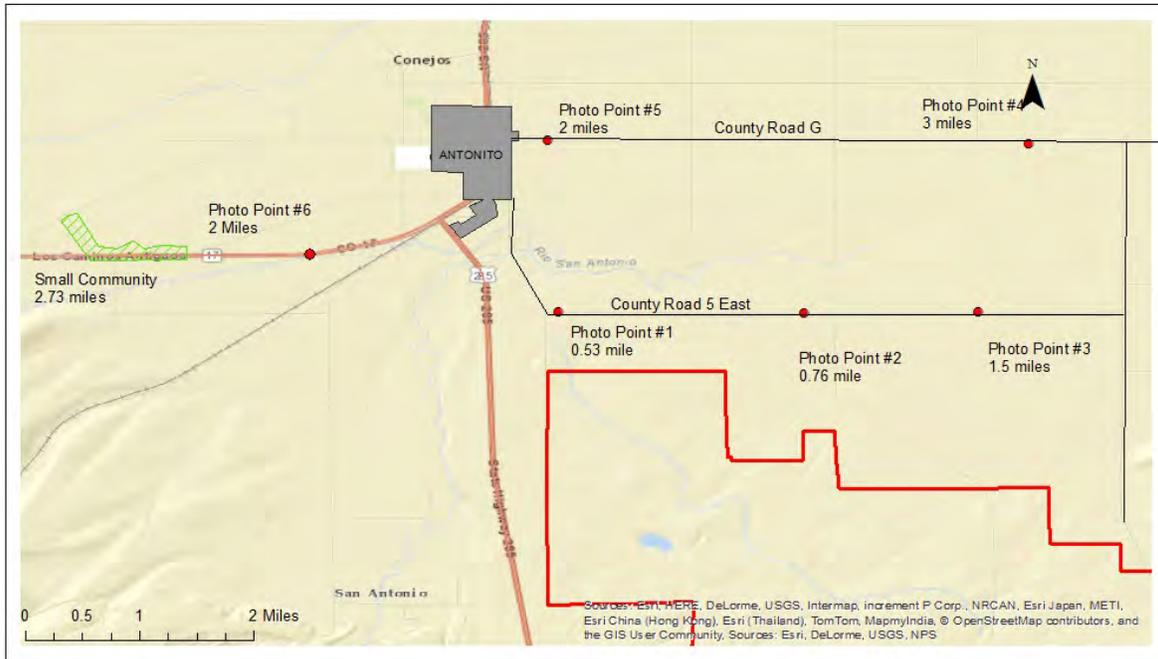
## **METHODS**

- In each photograph the SEZ was placed at the center of the frame when it was visible. Its location was approximated using a 1:100,000 BLM Land Status map if the SEZ could not be seen.
  - The distances from the photo points to each SEZ were measured in Google Earth from the photo point to the nearest boundary of the SEZ.
  - The approximate compass bearings to the SEZ were determined in Google Earth by creating a line from the photo point to the closest part of the SEZ.
- **OBSERVATIONS FOR THE LOS MOGOTES EAST AND ANTONITO SOUTHEAST SEZs**

### **Observation Notes**

- For observations of Los Mogotes East SEZ, only those photo points where it seemed possible that the Los Mogotes SEZ would be visible were used. Structures, vegetation and intervening terrain made it impossible to see any part of the Los Mogotes SEZ from ground level from some potential photo points.
- An estimate of the numbers of homes on Conejos County road E-5 is about 5 homes with most of these clustered at the east end of the road near the intersection of Conejos County roads E-5 and 18.
- Approximately 12 homes are located near photo point #6 on Colorado Highway 17 west of Antonito, with most of these clustered in or near the community of Paisaje which is about three miles southeast of the Antonito SE SEZ at a bearing of approximately 110°. Facilities in the SEZ may be visible if sited on ridge tops, if they are over two stories high, or if they emit vapor plumes. Screening by terrain and vegetation will likely block most the view from this area to the SEZ.

### ADDITIONAL OBSERVATIONS OF THE ANTONITO AND LOS MOGOTES SEZs



**Legend**

- Photo Point
- ▨ Small Community
- ▭ Antonito\_SEZ

#### Additional Observation/Photo Points for Antonito SE and Los Mogotes SEZs

Distance from each photo point to closest point of Antonito SE SEZ provided

Los Mogotes SEZ is not visible from photo points due to screening by vegetation and terrain.



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This information may not meet the same accuracy standards  
that would be developed through data management  
and be updated without notice.

**Photo Point 1: Conejos County Road 5E, 1.12 miles from the Antonito City Limits**

**A view south (Approximate Bearing 180°) to the Antonito SE SEZ**



**Comments:** Views of solar facilities within the Antonito Southeast SEZ would be largely unobstructed. Facilities may be built on the slight ridge at the center of the photo. The closest point in the SEZ is one mile from the photo point.

**Photo Point 1: Conejos County Road 5E, 1.12 miles from the Antonito City Limits**

**A view north (Approximate Bearing 337°) toward the Los Mogotes SEZ**



Photo Point #1

**Comments:** Views of solar facilities within the Los Mogotes East SEZ would be largely screened from this point by structures, vegetation and terrain. The closest point in the SEZ is approximately 7.7 mi from the photo location.

**Photo Point 2: Conejos County Road 5E, 2.85 miles from the Antonito City Limits**

**A view south (Approximate Bearing 180°) toward the Antonito SE SEZ**



**Comments:** Views of solar facilities within the Antonito Southeast SEZ would be largely unobstructed. Facilities may be built on the slight ridge at the center of the photo. The closest point in the SEZ is 2.85 miles from the photo point.

**Photo Point 2: Conejos County Road 5E, 2.85 miles from the Antonito City Limits**

**A view north (Approximate Bearing 330°) toward the Los Mogotes SEZ**



**Comments:** Views of solar facilities within the Los Mogotes East SEZ would be largely screened from this point by structures, vegetation and terrain. The closest point in the SEZ is approximately 8.6 miles from the photo location.

**Photo Point 3: Conejos County Road 5E, 4.1 miles from the Antonito City Limits**

**A view south (Approximate Bearing 190°) toward the Los Mogotes SEZ**



**Comments:** Views of solar facilities within the Antonito Southeast SEZ would be largely unobstructed. Facilities may be built on the slight ridge at the center of the photo. The closest point in the SEZ is 2.85 miles from the photo point.

**Photo Point 4: Conejos County Road G, 3.6 miles east of the Antonito City Limits.  
(Parking lot of the Lobatos church)**

**A view south (Approximate Bearing 180°) toward the Antonito SEZ**



Photo Point #4

**Comments:** Views of solar facilities within the Antonito Southeast SEZ would be largely screened from this point by structures, vegetation and terrain. The closest point in the SEZ is approximately 2.9 miles from the photo location.

**Photo Point 5: Conejos County Road G, 0.2 miles east of the Antonito City Limits**

**A view south (Approximate Bearing 180°) toward the Antonito SEZ**



Photo Point #5

**Comments:** Views of solar facilities within the Antonito Southeast SEZ would be largely screened from this point by structures, vegetation and terrain. The closest point in the SEZ is approximately 2.0 miles from the photo location.

**Photo Point 6: Colorado Highway 17, 1.2 miles west of the Antonito City Limits at mile marker 38**

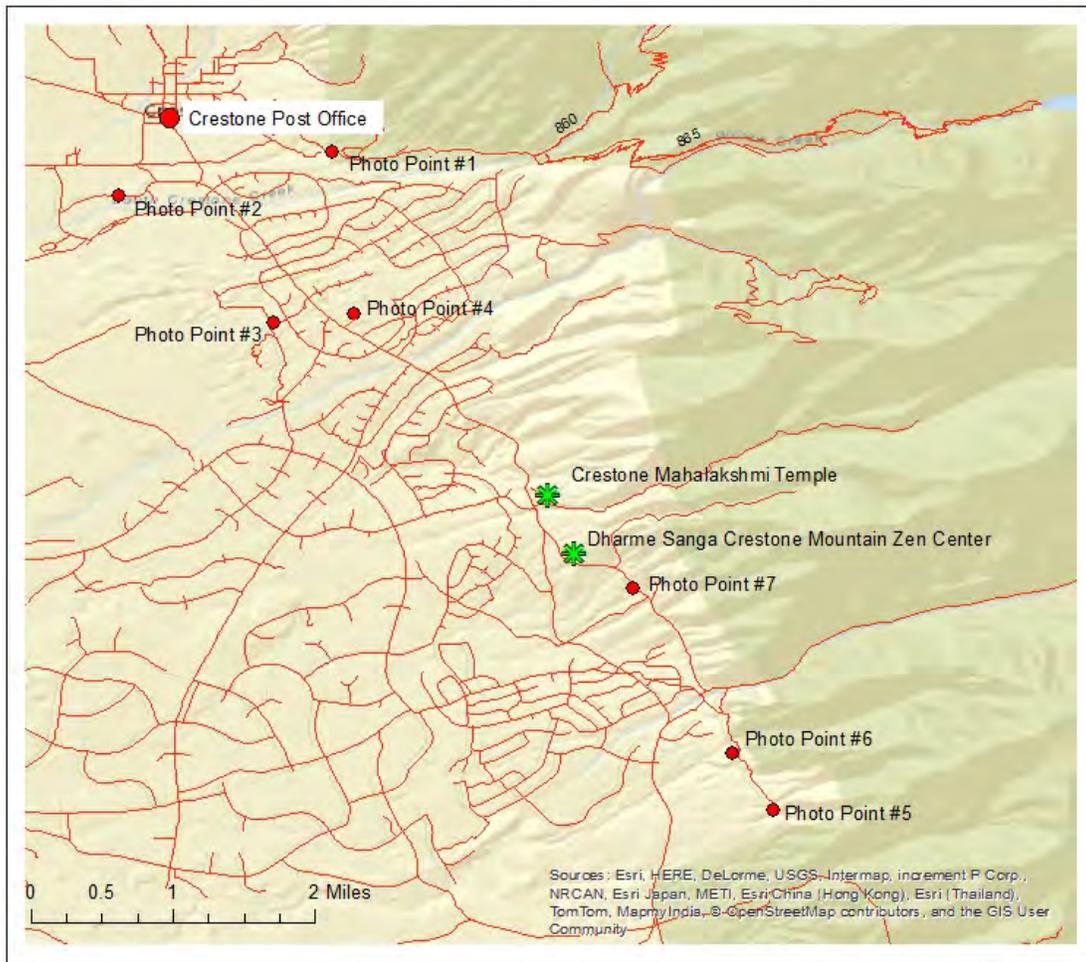
**A view southwest (Approximate Bearing 120°) toward the Antonito SEZ**



Photo Point #6

**Comments:** Views of solar facilities within the Antonito Southeast SEZ would be largely screened from this point by structures, vegetation and terrain. The closest point in the SEZ is approximately 2.0 miles from the photo location.

#### **ADDITIONAL OBSERVATIONS OF THE DETILLA SEZ**



### Additional Observation/Photo Points for De Tilla SEZ

Distance from photo point #1 to De Tilla SEZ is about 18 miles and to photo point #5 about 23 miles

From ground level at most locations in the Crestone area, the SEZ is well screened or somewhat screened by terrain and vegetation or is at such a distance as to reduce visual contrast

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**Photo Point 1: East Galena Avenue, 1.0 mile by road from the Crestone Post Office**

**A view northwest (Approximate Bearing 298°) to the De Tilla SEZ**



**Comments:** Views of solar facilities within the De Tilla SEZ would be largely unobstructed but at a distance of 18 miles. The SEZ is located just above the red arrow.

**Photo Point 2: Colorado College on the Baca, from #7 Back Townhouse Road, Crestone**

**A view northwest (Approximate Bearing 300°) to the De Tilla SEZ**



**Comments:** Views of solar facilities within the De Tilla SEZ would be well screened and at a distance of 17 miles. The SEZ is located at approximately the position of the red arrow.

**Photo Point 3: Nada Carmelite Hermitage, #1 Carmelite Way, Crestone, CO**

**A view northwest (Approximate Bearing 303°) to the De Tilla SEZ**



**Comments:** Views of solar facilities within the De Tilla SEZ would be largely unobstructed but at a distance of 18.4 miles. The SEZ is located approximately just above the red arrow.

**Photo Point 4: Stupa of Enlightenment ~ Jangchub Chörten on Camino Baca Grande, 2.46 miles from the Crestone Post Office**

**A view northwest (Approximate Bearing 300°) to the De Tilla SEZ**



**Comments:** Views of solar facilities within the De Tilla SEZ would be largely unobstructed but at a distance of 18.7 miles. Normally for an observer at ground level, forest vegetation would screen the SEZ from view. The SEZ is located approximately just above the red arrow.

**Photo Point 5: Tashi Gomang Stupa at the South end of Dream Way, 7 miles from the Crestone Post Office**

**A view northwest (Approximate Bearing 306°) to the De Tilla SEZ**



**Comments:** Views of solar facilities within the De Tilla SEZ would be largely unobstructed and at a distance of 23 miles. The SEZ is located approximately just above the red arrow.

**Photo Point 6: Intermediate Location on Dream Way, 6.5 miles from the Crestone Post Office**

**A view northwest (Approximate Bearing 304°) to the De Tilla SEZ**



**Comments:** Views of solar facilities within the De Tilla SEZ would be largely unobstructed and at a distance of 22.1 miles. The SEZ is located approximately just above the red arrow.

**Photo Point 7: Shumei International Institute, 3000 Dream Way, 4.4 miles from the Crestone Post Office**

**A view northwest (Approximate Bearing 302°) to the De Tilla SEZ**



**Comments:** Views of solar facilities within the De Tilla SEZ would be largely unobstructed and at a distance of 22.3 miles. The SEZ is located approximately just above the red arrow.

#### **Additional Observations for the De Tilla SEZ**

- Observations were made from two additional locations, the Crestone Mahalakshimi Temple and the Dharma Sanga Crestone Mountain Zen Center, to determine if the De Till SEZ would be visible from either. The Mahalakshimi Temple sets in a steep sided valley with no view of the SEZ. Zen Center although it is situated on a northwest trending ridge facing the SEZ the SEZ is not visible from ground level due to screening by forest vegetation.

#### **REFERENCES**

USDI Bureau of Land Management

1984 Visual Resource Management Program Manual 8400.

[http://www.blm.gov/style/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_manual.Par.34032.File.dat/8400.pdf](http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.34032.File.dat/8400.pdf) accessed 4-17-2015.

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2012 Final Solar Energy Development Programmatic Environmental Impact Statement (Solar PEIS).  
<http://solareis.anl.gov/documents/fpeis/index.cfm> accessed 4/17/2015.