

**A.13-09-014 SDG&E 01/31/14 Response**  
**Salt Creek Substation Project PTC**  
**Energy Division Deficiency Report #2 Dated December 20, 2013**  
**DR2-ED-005**

#	Deficiency #	Deficiency	SDG&E Response
<b>Aesthetics</b>			
1	DR-3.1	<p><b>The photo simulations did not use industry-standard methods. Please prepare the simulations using current industry standards.</b></p> <p>Visual simulations are used to analyze a proposed project’s visual effects on the landscape. They also serve as a way to inform stakeholders of the expected project effects on private and public viewsheds. Visual simulation methodology is a science-based approach to accurately portray the baseline and post-project visual conditions. Visual simulations that do not adhere to industry-standard methodologies can lead to erroneous depictions of the project impacts on the visual environment, can bias the analysis, and are not defensible.</p> <p>An important part of the simulation includes capturing representative photographic images of the project’s baseline visual conditions. Before digital cameras became mainstream this was relatively straightforward because 35 mm film was the medium used to capture the images (35 mm horizontal and 24 mm vertical). Baseline photos were taken with a single-lens reflex camera with a 50 mm lens, representing a horizontal view angle of ±40 degrees. The 50 mm equivalent focal length (EFL) produces a 38.6° horizontal field of view (HFOV), which best represents the human visual perception (National Research Council 2007: 353). Further, this setting represents the normal human eye magnification and the primary view cone (excluding peripheral vision).</p> <p>When digital single-lens reflex (DSLR) cameras became mainstream the 50 mm EFL equation became more</p>	<p>Per our discussion with the Energy Division on January 6, 2014, the consultant has modified the existing simulations to approximate a 50 mm view following the methodology described below.</p> <p>A geometric analysis of the existing simulation relative to the view angle was conducted. Each simulation (and existing view) was interpolated both horizontally and vertically by mathematically calculating how and where the submitted simulations would be modified. In addition, the existing plan view worksheet was used as a visual guide to confirm the outside view angle.</p> <p>Software utilized included Autocad Civil 3d 2014, Photoshop CS6, 3d Studio Max and Thumbsplus Image Manipulation. The center point of each view point remained the same with the horizontal and vertical outside edges coming closer to the center as needed to make the view angle 40 deg. During the process of adjusting the scale of the images, some project features (e.g. grading, scale and color) were corrected, as necessary. The revised simulations (and existing views) are provided digitally in Attachments DR2.1-1A through DR2.1-1D.</p> <p>In addition, clarification on camera data for key views 2 and 4, as well as methodology for key view 9, is provided in Attachment DR2.1-2. For key views 2 and 4, this information supersedes camera data that was provided within Attachment DR.3-1 during the last data request.</p>

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		<p>complicated; 35 mm film was replaced with digital sensors that vary in size. The camera lens remained unchanged in the film to digital evolution. Professional DSLRs that cost thousands of dollars have a full-sized sensor, which means they are the same size as 35 mm film (i.e., 35 mm x 24 mm) and there is no conversion necessary, so a 50 mm focal length is equivalent. Less expensive DSLRs have a smaller, less expensive sensor to digitally capture the images. This smaller sensor affects the resultant image by effectively magnifying it. This is often referred to as the crop factor. For instance, Nikon's entry-level DSLR uses an APS-C sensor that is 25.1 mm x 16.7 mm. The mathematical formula used to calculate the EFL for this sensor dictates that a focal length of 34 mm will be a 50 mm EFL. In summary, the size of the digital sensor (analogous to film size) dictates the focal length used to record and properly capture baseline visual conditions.</p> <p>The camera metadata from the response to Deficiency Letter #1 (item 3.1) and response to Data Request #1 (item 51) shows that the key view baseline conditions were captured with two different cameras. The first camera is a Canon PowerShot SD1100 IS. The second is a GPS-enabled Panasonic DMC-ZS10. The Panasonic is the more sophisticated of the two cameras and includes a line item for the 35 mm equivalent. This information is excerpted below for Key View 9:</p> <p>Original date/time: 2013.07.09 14:02:21  Exposure time: 1/3200  F-stop: 3.3  ISO speed: 100</p>	

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		<p>Focal length: 4.3000</p> <p><b>Focal length (35 mm): 26</b></p> <p>Exposure bias: 0.0000</p> <p>Metering mode: Pattern</p> <p>Digital zoom ratio: 0.0000</p> <p>GPS Tag Version: 02,03,00,00</p> <p>GPS Latitude: 32° 37' 15.3900"</p> <p>GPS Longitude: 116° 56' 57.9000"</p> <p>GPS Satellites: 5</p> <p>GPS Status: A</p> <p>GPS Measure Mode: 2</p> <p>GPS Degree of Precision: 0.8000</p> <p>GPS Map Datum: WGS-84</p> <p>Camera make: Panasonic</p> <p>Camera model: DMC-ZS10</p> <p>X resolution: 180.0000</p> <p>Y resolution: 180.0000</p> <p>Resolution unit: Inches</p> <p>Camera version: Ver.1.0</p> <p>Colorspace: sRGB</p> <p>The baseline images used in the visual simulations for the Salt Creek Substation and TL 6965 were taken with a 26 mm EFL. The 26 mm EFL used to capture the images is a wide-angle view. The wide-angle yields exaggerated horizontal and vertical fields of view; it also minimizes the</p>	

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		<p>size and mass of the elements in the view making all the project elements appear smaller in the visual simulations than they would appear in reality to the human eye. Exhibits 1 through 3 illustrate this point. Visual simulations prepared using the correct methodology will compare well to the existing visual conditions in the field and can be used to accurately quantify visual change. The simulations printed on 11 x 17 inch paper can be taken to the GPS provenienced Key View location and then held so that the size of the simulations is perceived to be in scale with the visual baseline. This is not possible with wide-angle views such as the 26 mm EFL used in Key View 9 above because of the reduced magnification of the view.</p>	

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Exhibit 1 - This graphic shows the locations of the GPS supplied coordinates for Key View 7 and the location of the view from investigations on the site visit. The 2 black lines are the horizontal field of view shown in the SDG&E supplied baseline conditions and the visual simulations. The 2 red lines are the industry standard 40° view cone which would be captured using a 50mm focal length equivalent camera lens. Exhibits 2 and 3 graphically demonstrate the dichotomy that exists between the 2 approaches.



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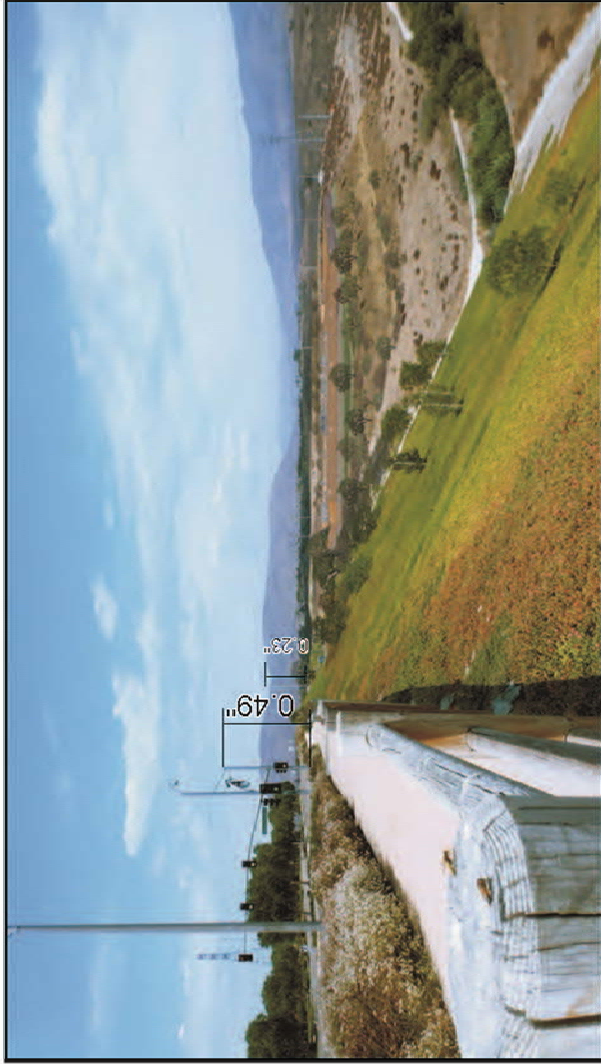


Exhibit 2 - SDG&E supplied visual simulation from Key View 7 using a 26mm equivalent focal length lens. The horizontal field of view for this photo is  $\pm 80^\circ$ . Note the vertical dimension of the street light pole and the existing monopole of TL 6913.

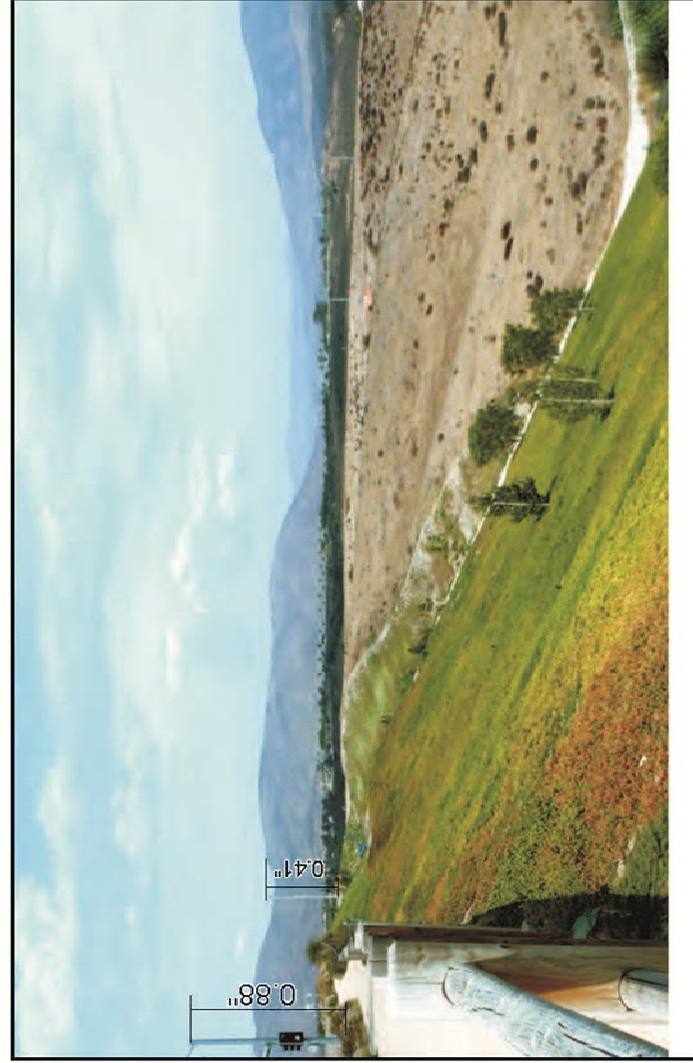


Exhibit 3 - Key View 7 showing a  $\pm 40^\circ$  horizontal field that a 50mm equivalent focal length lens would capture. Note the vertical dimension of the street light pole and the monopole.

## **Attachment DR2.1-2**

Visual Simulation Clarification for Key Views 2, 4, and 9

The supplemental information below is provided to clarify visual simulation methodology and camera information for Key Views 2, 4, and 9. The simulations of Key Views 2 and 4 were prepared using Google street view images, and Key View 9 was revised to remove atypical construction equipment in the foreground, as described further below. Camera data for Key Views 2 and 4 provided in CPUC response DR.3-1 was inadvertently provided for original field images, not the final Google street view images used in the PEA.

### **Key Views 2 and 4**

Photographs were taken in the field for Key Views 2 and 4. A Google street view image was captured and enhanced (i.e. sharpening and contrast improvement) for each view and was compared with the photographs taken in the field. The consultant (Estrada Land Planning) determined that the quality and orientation of the street view images provided more comprehensive information regarding the Key View. Therefore, Google street view images were used as the existing photographs for these two Key Views.





Original Key View 2 Field Photograph - Looking East (In this photo, project features would include power lines across the road, and would not include the proposed pole north of the road). The consultant determined that the orientation, dark quality, and blurry details of this image did not provide as much information as the subsequent image ultimately used in the PEA.



Final Key View 2

Google Image - Looking North (before cropping to 50 mm size) (In this photo, project features would include power poles and lines)



Original Key View 4 Field Photograph - Looking South (In this photo, project features would include power poles and lines). The consultant determined that the dark quality and blurry details of this image did not provide as much information as the subsequent image ultimately used in the PEA.



Final Key View 4 Google Image - Looking South (before cropping to 50 mm size) (In this photo, project features would include power poles and lines)



## Key View 9

At the time the Key View 9 field photograph was taken, construction equipment was present on-site and in the foreground of the image, as shown below.



Original Key View 9 Field Photograph - Looking South (note construction equipment)

The existing view was modified to remove the construction equipment so that the change in the project could be viewed more clearly, without the visual clutter associated with the temporary presence of construction equipment. Below is the modified final existing photo showing the existing view with vegetation.



Final Key View 9 Existing Field Photograph - Looking South (before cropping to 50 mm size)  
(Construction equipment has been removed)