TETRA TECH EC, INC.

California Energy Commission
DOCKETED
11-AFC-3
TN # 67712
OCT 15 2012

October 12, 2012

Eric Solorio, Project Manager
California Energy Commission
Docket No. 11-AFC-3
1516 9th St.
Sacramento, CA 95814

Cogentrix Quail Brush Generation Project - Docket Number 11-AFC-3, Revised Visual Simulations for the Quail Brush Generation Project

Docket Clerk:

Pursuant to the provisions of Title 20, California Code of Regulations, and on behalf of Quail Brush Genco, LLC, a wholly owned subsidiary of Cogentrix Energy, LLC, Tetra Tech hereby submits the Revised Visual Simulations for the Quail Brush Generation Project (11-AFC-3). The Quail Brush Generation Project is a 100 megawatt natural gas fired electric generation peaking facility to be located in the City of San Diego, California. The following issue area is addressed in this submittal:

- Visual Resources

If you have any questions regarding this submittal, please contact Rick Neff at (704) 525-3800 or me at (303) 980-3653.

Sincerely,

Constance E. Farmer
Project Manager/Tetra Tech

cc: Lori Ziebart, Cogentrix
John Collins, Cogentrix
Rick Neff, Cogentrix
Proof of Service List

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE QUAIL BRUSH GENERATION PROJECT

DOCKET NO. 11-AFC-03
PROOF OF SERVICE
(Revised 10/08/2012)

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DECLARATION OF SERVICE

I, Constance Farmer, declare that on October 12, 2012, I served and filed a hard copy and a CD of the attached Revised Visual Simulations for the Quail Brush Generation Project dated October 12, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: http://www.energy.ca.gov/sitingcases/quailbrush/index.html.

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(*Check all that Apply*)

For service to all other parties:

x Served electronically to all e-mail addresses on the Proof of Service list;

x Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses marked *"hard copy required" or where no e-mail address is provided.

AND

For filing with the Docket Unit at the Energy Commission:

x by sending an electronic copy to the e-mail address below (preferred method); *OR*

___ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-03
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

___ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
michael.levy@energy.ca.gov

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Constance C. Farmer

Visual Simulation Methodology

Introduction

This document provides a detailed description of the methods used to prepare the attached simulations (Figures 4.5-10 through 4.5-14) for the Quail Brush Generation Project (11-AFC-3). Each figure has two pages – the first displays the Existing Condition and the second displays the Photographic Simulation. The Photographic Simulation page contains two images. The first is per CEC protocol, which requires that the image be at life-size scale when the picture is held 10 inches from the viewer's eyes, including any project-related electrical transmission lines, in the existing setting from each key observation point. The second shows a more panoramic view of the facility.

A typical visual simulation is produced by combining GPS-captured site photography with accurate, rendered computer models to predict what would be seen from a specific location if the proposed project was actually built.

Creation of visual simulations to analyze the potential impacts of the proposed project can be broken into the following 5 primary steps:

- Design Data Review / Asset Collection
- Site Reconnaissance/Photography
- Computer 3D Digital Modeling / Materials Texturing
- View-Matching / Lighting / Rendering
- Digital Painting / Compositing

1. Design Data Review / Asset Collection

Before the simulation production process begins, a comprehensive and thorough review of available design data of the proposed project must be conducted. This data is typically developed by the project engineering/design team and provided by the project proponent to the simulation team. Tetra Tech uses the design data to confirm assumptions made during the study planning process, and may need to follow up to obtain additional design information as needed. Tetra Tech uses the project design data as the basis for producing visual simulation imagery.

2. Site Reconnaissance/Photography

The second step of the process is a site reconnaissance of the study area. During the reconnaissance, photographs are taken to document a wide range of existing views within the area surrounding the proposed project.

With a 35-mm film camera or a full-frame digital camera, a 50 mm lens is "generally acceptable to balance the level of detail captured and appropriate field of view" (Smardon 2012). A Nikon D90 digital single lens reflex camera (dSLR) was used to take the project photographs. The Nikon D90 is equipped with a 23.6x15.8mm CMOS sensor, with a diagonal measurement of

28.4 mm. The crop factor[1] for the D90, when compared to a 35-mm camera, is 1.5. The normal focal length (50mm) divided by the crop factor yields the appropriate size lens to use with a D90 to achieve a "normal" field of view – 33.3, or 35mm. Therefore, a fixed 35-mm lens was used with the Nikon D90 to take the project photographs. The Nikon D90 dSLR was also equipped with a Global Positioning System (GPS) device manufactured by Promote Systems. This GPS device records the latitude and longitude of each photograph as it is taken and embeds this information in the .jpg file.

The photographic inventory serves as a sampling of the visual landscape and represents typical views from publicly accessible areas, e.g. major travel routes, recreational use areas, local landmarks, and communities near the proposed project site. From this inventory of photographs, base images for a subset of the photo locations will be selected for further study in visual simulations, typically called *Key Observation Points (KOPs)*. KOPs are representative viewing locations that sufficiently address the applicable range of viewing and viewer conditions within the study area. KOPs are identified to include visually sensitive areas where viewers would have a heightened awareness of visual change and could notice a change in the existing landscape setting due to the presence of the Project.

Tetra Tech prepares a detailed record of each area identified as a potential KOP. Each photograph is documented according to time of day, month, and year. The latitude and longitude of the view location is also recorded using a GPS unit attached to the camera. This information will be subsequently integrated into a GIS database of the study area produced by Tetra Tech. Metadata or (EXIF) data is collected and recorded by the digital camera. This data provides information including time, date, camera type, exposure, and focal length. The focal length provided by the EXIF data is used to set the focal length in the digital model. The time and date are used to set the sunlight parameters within the virtual scene.

3. Computer 3D Digital Modeling / Materials Texturing

To ensure accuracy in portraying the proposed project from the selected KOPs, a three dimensional (3D) computer model is created using a combination of AutoCAD, GIS Software, and 3DStudio Max. The model is typically comprised of the following components:

1. Base Model / Context Model
2. Proposed Project / Development Model
3. Textures and Materials
4. Computer simulated lighting
5. Virtual Cameras

Base Model / Context Model

The base model is a scene of the study area measured in real-world units. It is the virtual environment that contains all of the modeled components used to produce the visual simulations. The base model is generated to provide accurate contextual information for the location and placement of the 3D modeled project components in the scaled, virtual computer

[1] Crop factor is defined as the ratio of the dimensions of a camera's imaging area compared to a reference format, most often a 35-mm film camera or "full frame" dSLR. Crop factor is calculated as the ratio of the diagonal measurement of a 35-mm film or full-frame dSLR sensor (43.3 mm) to the diagonal measurement of the sensor being compared.

environment. It is comprised of an ortho-rectified aerial photograph of the study area. The basis for this information is typically extracted from a combination of GIS spatial data for the study area, land survey data, and design drawings for the project. The following data are typically used to develop the 3D model:

1. USGS Digital Elevation Model (DEM) of the study area, commonly using at 10-meter resolution
2. Design drawings of the proposed project components (CAD)
3. Existing roads
4. Existing pertinent site elements (Project Specific)
5. Key Observation Points (latitude, longitude and elevation coordinates)

Proposed Project / Development

The proposed project 3D Model is an accurately scaled depiction of the project that is fit into the study area landscape. The accuracy of the result is dependent on how much detailed design data is available at the time of production. Suggested material treatments for the project are then created as “textures” to be assigned to the 3D model surfaces to enhance the look and feel.

Virtual Cameras

As discussed previously, representative KOPs are photographed with a dSLR camera for which the X,Y,Z coordinate position of the camera, focal length of the camera lens, and eye-level height of the photographer are identified. This data is integrated into the 3D computer model to create virtual camera viewpoints that match their positions in the scaled, virtual computer modeled environment to the lens of the original camera. This process is typically called “View-Matching”. This ensures that the 3D model of the proposed project in the scene will be accurately portrayed in scale and distance from the KOPs.

4. View-Matching / Lighting / Rendering

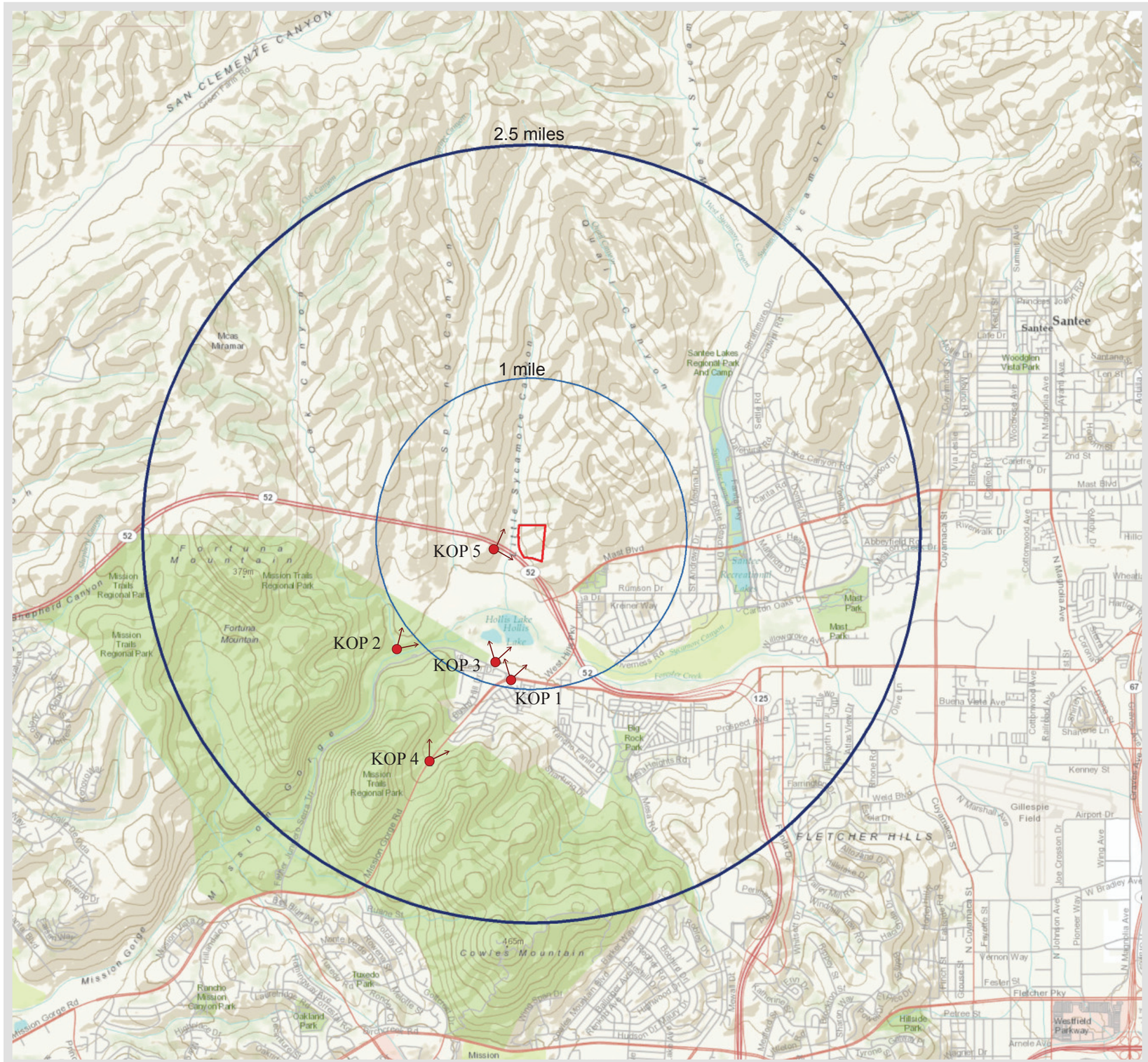
This is an essential step in the visual simulation process. A view-matching process is undertaken for each virtual camera, to match the modeled scene with the existing-condition photographs, using the embedded metadata taken from the original pictures. To be accurate, the 3D scene needs to have at least 3 existing elements (such as vegetation, building, or fence) that match the real world dimensions of key foreground, mid-ground and background elements in the photos. A terrain model, created from existing topography generated from USGS 10 meter DEM, is created to double-check that the virtual camera is matched well. Once matched, the model goes through the lighting process to match the existing weather conditions. The scene is then put through computer simulated lighting to accurately recreate the sun’s position – the original lighting depicted in the photographs, extracted from the EXIF data, based on time of day and time of year when the existing-condition photo for the respective KOP was taken. Then the scene’s virtual cameras go through a series of test calculations and rendering settings before a final set is exported.

5. Digital Painting / Compositing

Once the 3D model is constructed, view-matched, textured and put through the lighting process, the rendering of the 3D model is stitched together in photo stitching software (PT GUI), then composited over the existing conditions viewpoints using image editing software such as Photoshop. It is in this step that details from the computer model are blended seamlessly into the base photograph to produce the final visual simulations. Final print product is done in Adobe InDesign. Print size of images on the final layout is calculated using an equation that calculates viewing size based on camera type, lens, and distance to the viewer (equation can be provided upon request). The final images are then analyzed by the visual resources specialist to determine the potential changes to the viewshed that would occur if the project was constructed, and to evaluate the level of significance of those changes.

FIGURES

Key Observation Point Location Map



Legend

0 0.5 1 Miles

- Site Boundary
- 1 Mile Radius from Center of Site
- 2.5 Mile Radius from Center of Site
- Photo Point Location

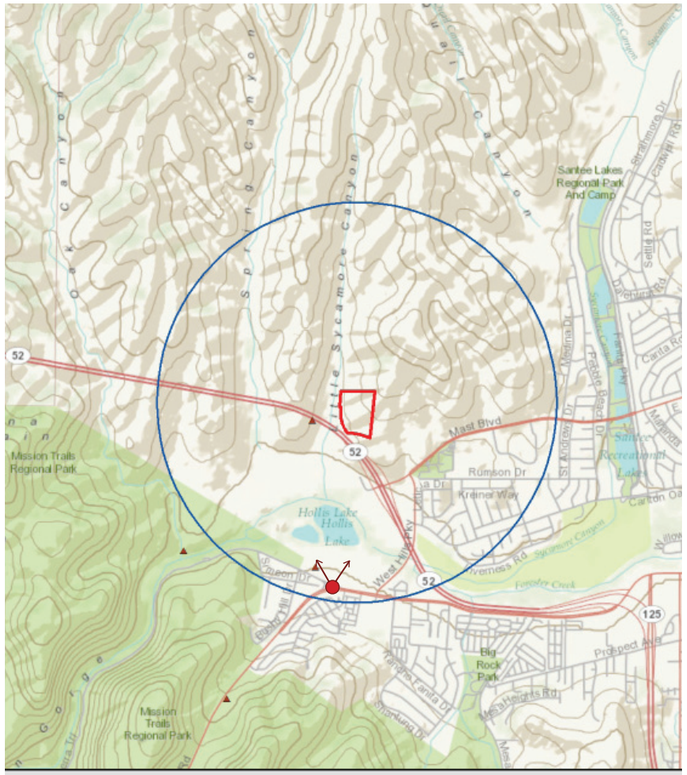
QUAIL BRUSH GENERATION PROJECT

TETRA TECH

Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-10 Existing Condition, KOP 1/Viewpoint 2, Mission Gorge Road



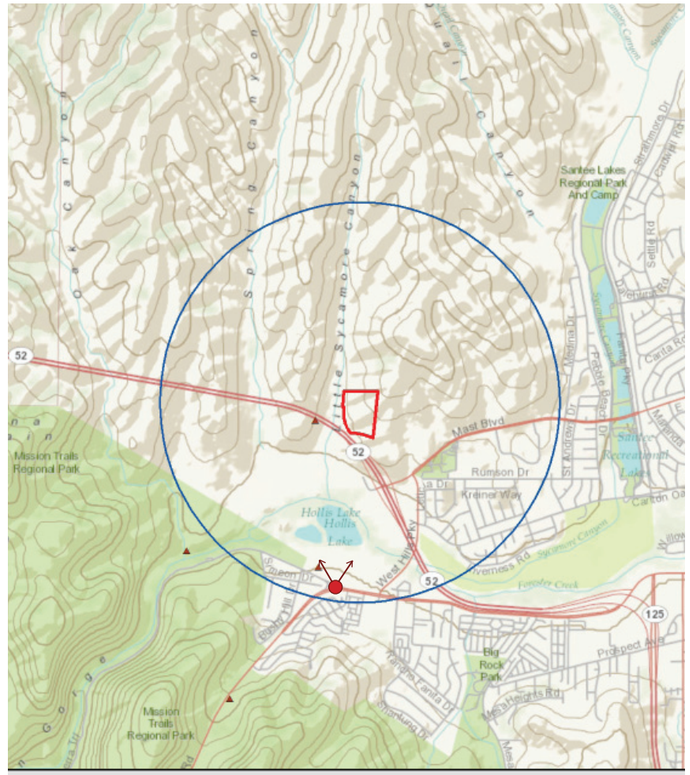
Photograph Information
- Viewpoint Number: 2
- Date of Photograph: 5/10/2011
- Time of Photograph: 1:27 PM
- Weather Condition: Partly Cloudy
- Viewing Direction: North
- Distance to Nearest Proposed Structure in View: 0.91 Mile
- Latitude: -117.03 N
- Longitude: 32.837 W
- Photo Location: 0.65 miles west of State Highway 52.

QUAIL BRUSH GENERATION PROJECT

TETRA TECH Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-10 Photographic Simulation, KOP 1/Viewpoint 2, Mission Gorge Road



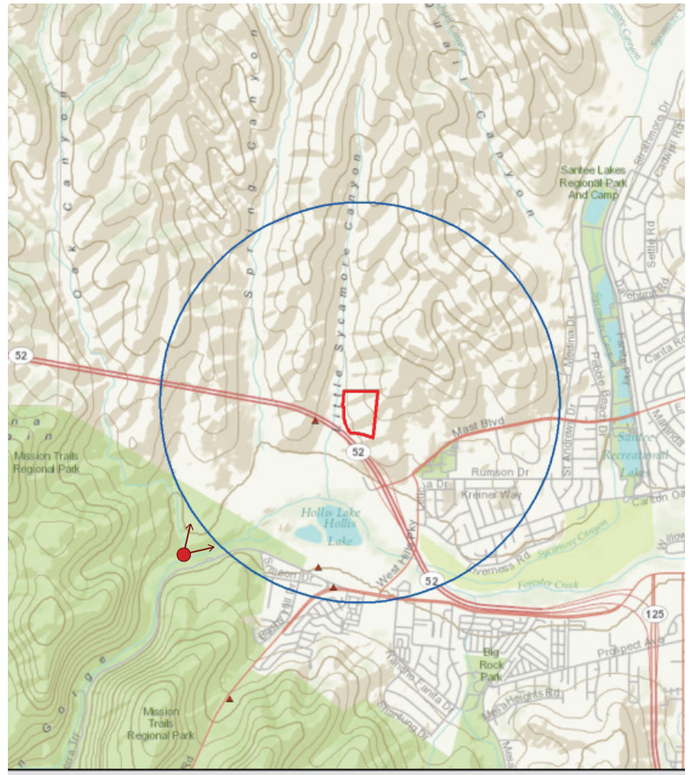
Photograph Information
- Viewpoint Number: 2
- Date of Photograph: 5/10/2011
- Time of Photograph: 1:27 PM
- Weather Condition: Partly Cloudy
- Viewing Direction: North
- Distance to Nearest Proposed Structure in View: 0.91 Mile
- Latitude: -117.03 N
- Longitude: 32.837 W
- Photo Location: 0.65 miles west of State Highway 52.

QUAIL BRUSH GENERATION PROJECT

TETRA TECH Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-11 Existing Condition, KOP 2/Viewpoint 5, Lookout Dam



Photograph Information
- Viewpoint Number: 5
- Date of Photograph: 6/22/2011
- Time of Photograph: 3:06 PM
- Weather Condition: Sunny
- Viewing Direction: Northeast
- Distance to Nearest Proposed Structure in View: 1 Mile
- Latitude: -117.04 N
- Longitude: 32.84 W
- Photo Location: Lookout Dam

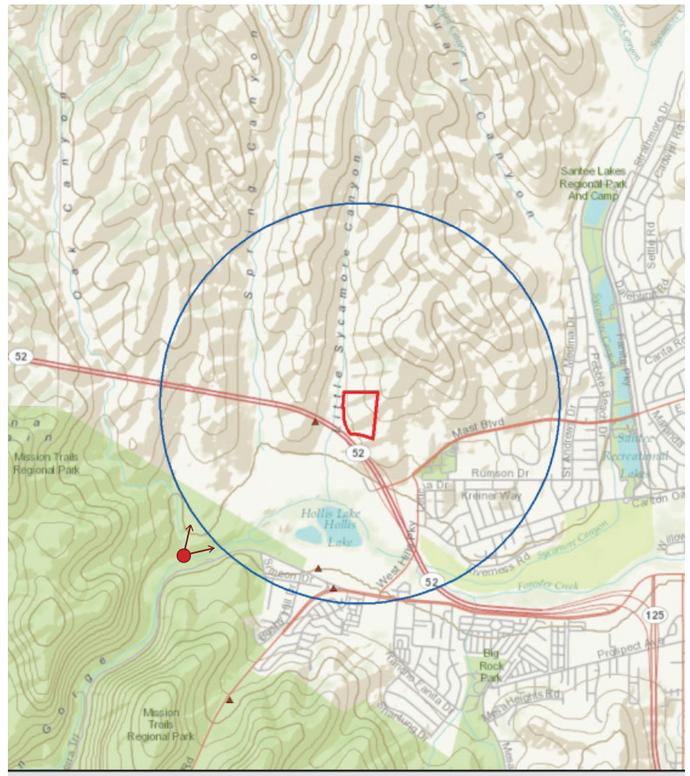
QUAIL BRUSH GENERATION PROJECT

TETRA TECH

Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-11 Photographic Simulation, KOP 2/Viewpoint 5, Lookout Dam



Photograph Information
- Viewpoint Number: 5
- Date of Photograph: 6/22/2011
- Time of Photograph: 3:06 PM
- Weather Condition: Sunny
- Viewing Direction: Northeast
- Distance to Nearest Proposed Structure in View: 1 Mile
- Latitude: -117.04 N
- Longitude: 32.84 W
- Photo Location: Lookout Dam

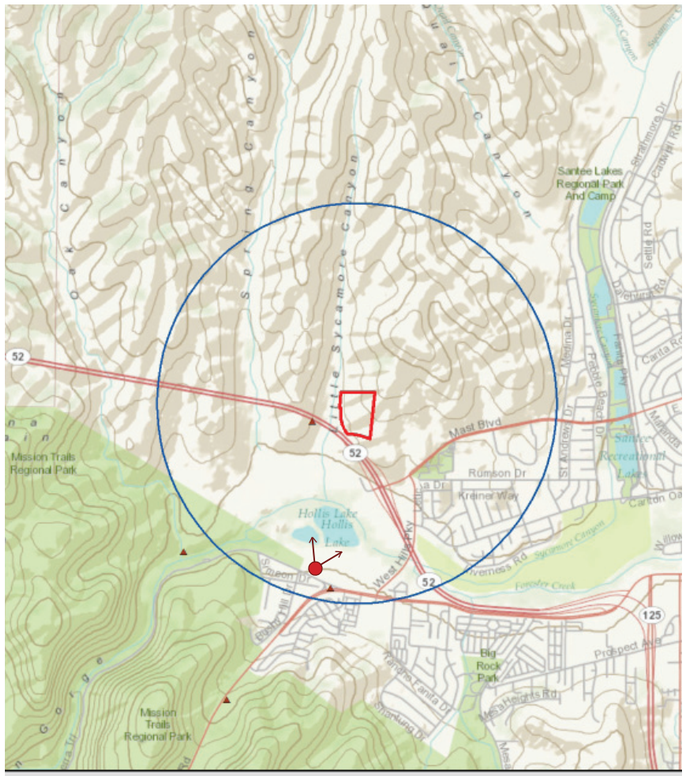
QUAIL BRUSH GENERATION PROJECT

TETRA TECH

Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-12 Existing Condition, KOP 3/Viewpoint 6, Campground



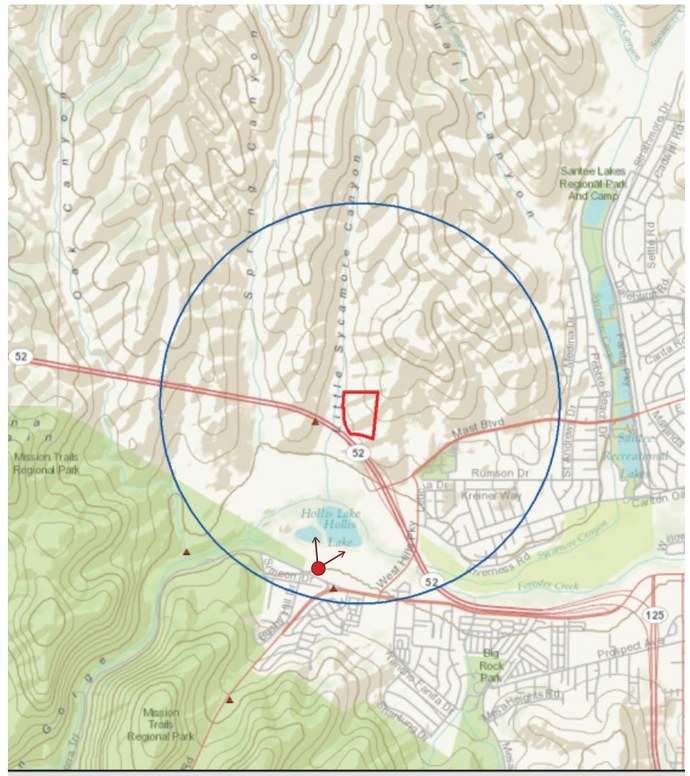
Photograph Information
- Viewpoint Number: 6
- Date of Photograph: 5/10/2011
- Time of Photograph: 1:27 PM
- Weather Condition: Partly Cloudy
- Viewing Direction: North
- Distance to Nearest Proposed Structure in View: 0.91 Mile
- Latitude: -117.03 N
- Longitude: 32.839 W
- Photo Location: Kumeyaay Campground

QUAIL BRUSH GENERATION PROJECT

TETRA TECH Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-12 Photographic Simulation, KOP 3/Viewpoint 6, Campground



Photograph Information
- Viewpoint Number: 6
- Date of Photograph: 5/10/2011
- Time of Photograph: 1:27 PM
- Weather Condition: Partly Cloudy
- Viewing Direction: North
- Distance to Nearest Proposed Structure in View: 0.91 Mile
- Latitude: -117.03 N
- Longitude: 32.839 W
- Photo Location: Kumeyaay Campground

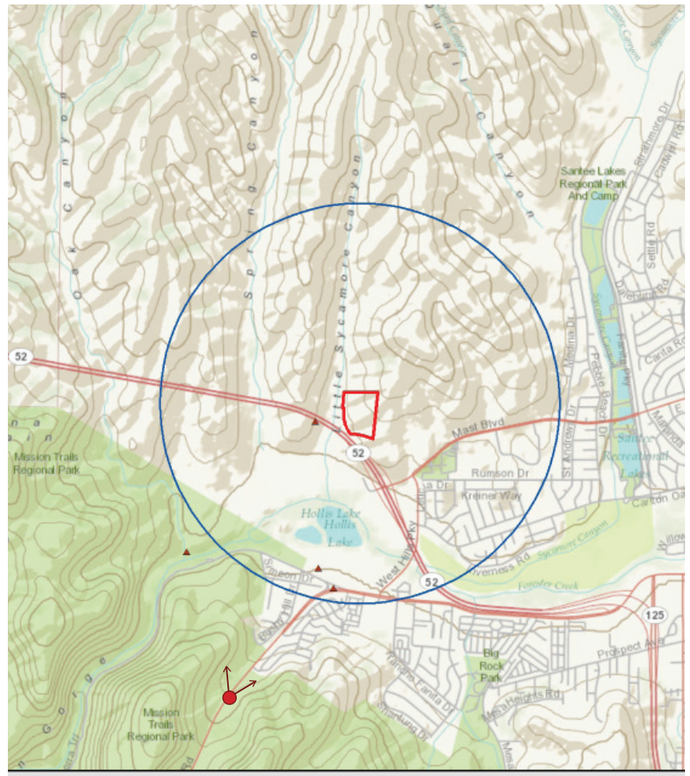
QUAIL BRUSH GENERATION PROJECT

TETRA TECH

Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-13 Existing Condition, KOP 4/Viewpoint 10, Mission Gorge Road



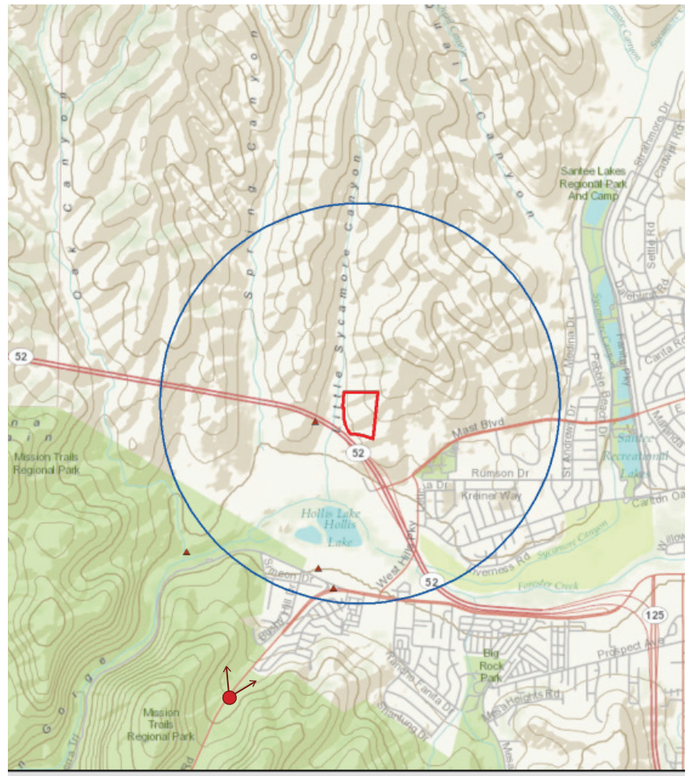
Photograph Information
- Viewpoint Number: 10
- Date of Photograph: 6/22/2011
- Time of Photograph: 4:01 PM
- Weather Condition: Sunny
- Viewing Direction: Northeast
- Distance to Nearest Proposed Structure in View: 1.47 Mile
- Latitude: -117.04 N
- Longitude: 32.839 W
- Photo Location: Mission Gorge Road

QUAIL BRUSH GENERATION PROJECT

TETRA TECH Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-13 Photographic Simulation, KOP 4/Viewpoint 10, Mission Gorge Road



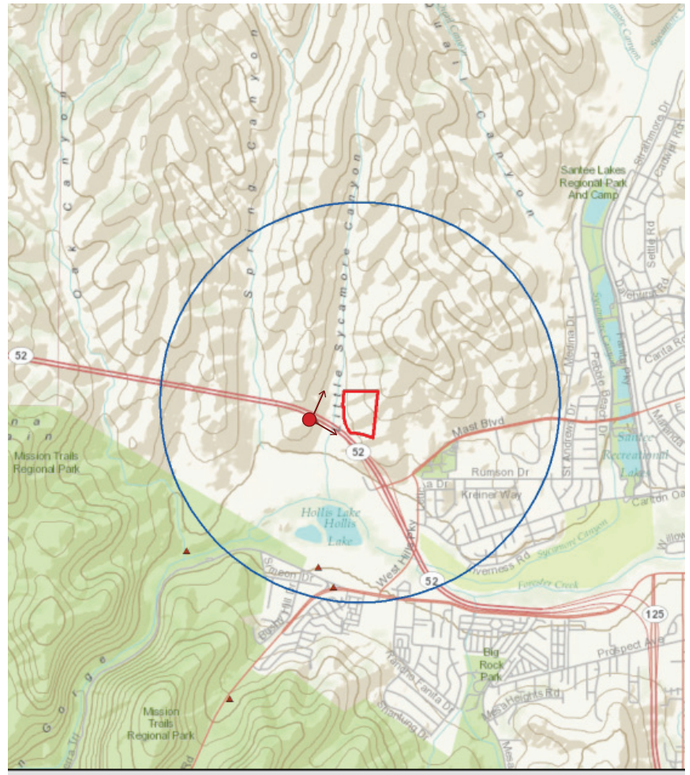
Photograph Information
- Viewpoint Number: 10
- Date of Photograph: 6/22/2011
- Time of Photograph: 4:01 PM
- Weather Condition: Sunny
- Viewing Direction: Northeast
- Distance to Nearest Proposed Structure in View: 1.47 Mile
- Latitude: -117.04 N
- Longitude: 32.839 W
- Photo Location: Mission Gorge Road

QUAIL BRUSH GENERATION PROJECT

TETRA TECH Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-14 Existing Condition, KOP 5/Viewpoint 11, State Highway 52



Photograph Information
- Viewpoint Number: 11
- Date of Photograph: 6/22/2011
- Time of Photograph: 4:23 PM
- Weather Condition: Sunny
- Viewing Direction: North
- Distance to Nearest Proposed Structure in View: 0.17 Mile
- Latitude: -117.03 N
- Longitude: 32.849 W
- Photo Location: Eastbound Lane on State Highway 52.

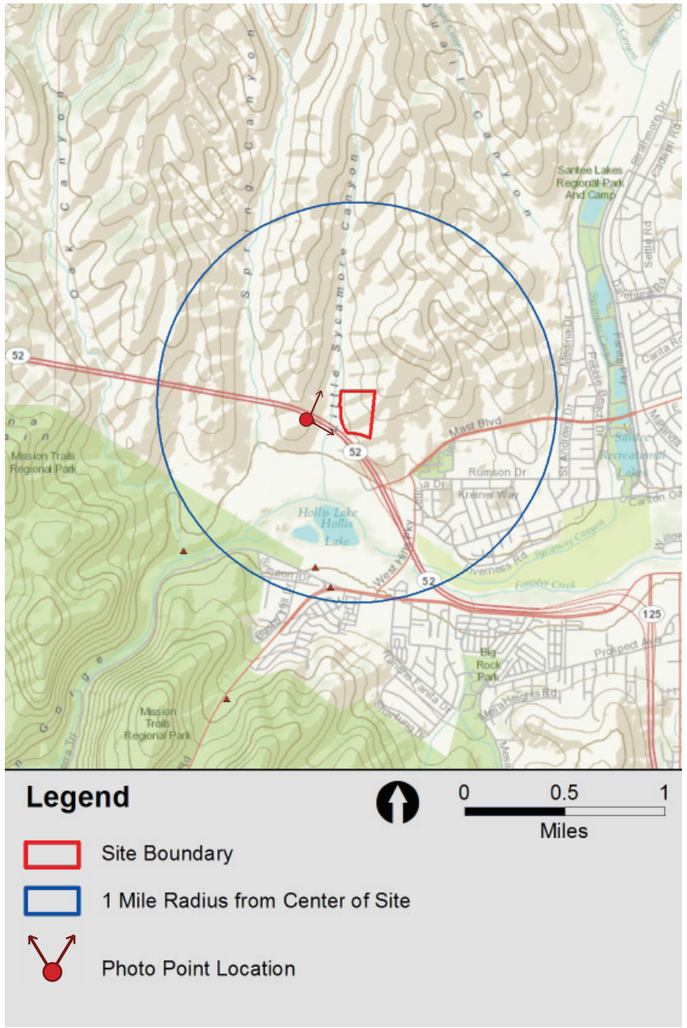
QUAIL BRUSH GENERATION PROJECT

TETRA TECH

Cogentrix

Above photograph is intended to be viewed 10 inches from viewer's eyes when printed on 11x17 paper. Photograph below has been enlarged to show project area.

Figure 4.5-14 Photographic Simulation, KOP 5/Viewpoint 11, State Highway 52



Photograph Information
- Viewpoint Number: 11
- Date of Photograph: 6/22/2011
- Time of Photograph: 4:23 PM
- Weather Condition: Sunny
- Viewing Direction: North
- Distance to Nearest Proposed Structure in View: 0.17 Mile
- Latitude: -117.03 N
- Longitude: 32.849 W
- Photo Location: Eastbound Lane on State Highway 52.

QUAIL BRUSH GENERATION PROJECT

TETRA TECH

Cogentrix