BIRD AND BAT MORTALITY MONITORING ANNUAL REPORT FOR THE CORAM CALIFORNIA DEVELOPMENT LP WIND GENERATION FACILITIES AT THE CAMERON RIDGE AND SECTION 15 PROJECT SITES FOR THE PERIOD OF May 2012 – April 2013

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July 2013

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1 INTRODUCTION AND BACKGROUND

1.1 Introduction

Coram California Development, L.P. (CCDLP) contracted M.H. Wolfe *and Associates* Environmental Consulting, Inc., to conduct a Bird and Bat Mortality Monitoring study, based on the plan submitted in 2009 and updated in 2012 (Wolfe 2012). The requirement for this plan and subsequent study can be found as mitigation measure number 13 within the California Environmental Quality Act (CEQA) Lot Line Adjustment Mitigated Negative Declaration for the Cameron Ridge Wind Energy projects, Kern County, California (CEQA 2011). Furthermore, mitigation measure number 13(d) of the CEQA document requires that a Mortality Analysis consisting of the results from the previous year's study be analyzed and reported to the Kern County Planning Department, U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW).

An initial scavenger study was conducted from November 14, 2010, through August 21, 2011, to establish the frequency of the mortality surveys. The field work for the mortality study was initiated following completion of construction, as required by the CCDLP Bird and Bat Mortality Monitoring Plan (Wolfe 2009 and 2012). Training of field staff and the first day of survey work were conducted on May 3, 2012. This report documents and analyzes the data collected from the first 12 months of the monitoring under the CCDLP Bird and Bat Mortality Monitoring Plan (Wolfe 2009 and 2012), which includes ongoing evaluation of surveyor accuracy.

CCDLP constructed 34 wind turbines as an expansion to an existing wind generating facility to help meet federal renewable energy goals (Energy Policy Act of 2005) and California's state renewable energy goals (Executive Order S-14-08). The proposed wind energy development included the installation of 34 new wind turbine generators on undeveloped, privately owned land. The project was divided into two areas, referred to as the Cameron Ridge and Section 15 Wind Projects. The two sites are referred to jointly as the CCDLP Wind Project.

Cameron Ridge is an existing wind farm that, prior to the current project construction, contained 40 operating wind turbines and about 150 older Aeroman turbines that are currently decommissioned. The Section 15 wind farm is also in operation, consisting of eight wind turbines. Both the Cameron Ridge and Section 15 wind farms are located within the Tehachapi Wind Resource Area (TWRA), which consists of about 235 square miles in Kern County. The development of commercial wind energy in the TWRA, on both private and public lands, began in the early 1980's. Over 5,000 wind turbines are currently installed and generating approximately 1,100 megawatts (MW) of renewable energy in the TWRA. In addition, numerous large scale projects are currently adding more than a thousand additional wind turbines to the area. The proposed

1.1 Introduction (continued)

CCDLP project is located within the western half of the TWRA in an area where wind turbines already exist.

1.2 Background

The Renewable Portfolio Standard (RPS) passed by the California Legislature in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107 mandated that investor-owned utilities must increase their use of renewable energy to meet 20 percent of their total load by 2010 and 33 percent by 2020. The local investor-owned utility, Southern California Edison (SCE), currently meets about 21 percent of its energy needs with renewable energy. In 2003, the California Energy Commission (CEC) issued its Renewable Energy Development Plan for California (CEC Publication, 500-03-080F), which rates the TWRA as the most favorable area in the state for development of large-scale wind power projects and called for the development of an additional 3,600 to 4,000 MW of wind energy in the TWRA. Thousands of turbines have been constructed, or are in the process of being built, to meet this requirement. Also, in 2009 the American Investment and Recovery Act added money available to renewable energy projects with a specific time requirement to use the funds. This project is using stimulus monies and has a tight timeframe for completion.

In 2007, SCE announced the start of construction of the Tehachapi Renewable Transmission Project (TRTP), a project that will construct a network of 500 kilovolt (kV) and 220 kV transmission lines and substations designed to receive the additional renewable energy from the TWRA and transmit the power throughout its Southern California distribution grid. When all phases of the TRTP are complete, this new transmission system will be capable of delivering 4,500 MW of electricity from the TWRA. The CCDLP project is one of many feeding into that system.

Wind energy is rapidly becoming one of the fastest growing energy sources in the search for clean renewable energy sources to replace fossil fuels (Pasqualetti *et al.* 2004). The region that has come to be known as the Tehachapi-Mojave Wind Resource Area (WRA) consists of 235 square miles of Kern County land that has been partially previously developed for commercial-scale wind energy facilities on both private and public lands located between the cities of Mojave and Tehachapi, California, beginning in the early 1980's. Over 5,000 wind turbine generators (WTGs) on 57 square miles of the WRA of various ownerships are currently installed and generating approximately 750 megawatts (MW) of renewable wind power within the WRA. The CCDLP project is located within the Tehachapi-Mojave WRA.

Although wind farms may have relatively low environmental impacts compared to the impacts of other sources of energy, they are not without some drawbacks.

1.2 Background (continued)

One of these impacts is the potential losses of birds and bats from collisions with wind turbines, power lines and/or other human structures. The extent of these impacts depends upon many things including, but not limited to the proximity of the wind facility to water, migratory routes, special bird or bat roosting or nesting locations, season, topographical layout of the wind farm, the habitat types on and adjacent to the wind farms, the types and sizes of turbines and turbine towers, and other factors. Bat mortalities are of particular concern for wind farms located on the east coast, where the rate of mortality is found to be in much higher concentrations than those occurring in the western region of the country; however, this phenomenon can be attributed primarily to the much larger populations of bats present in the eastern portion of the country.

A variety of bird and bat mortalities have been identified not only from turbines, but from human impacts. Bird losses may occur from vehicular mortality, hit on the side of the roads while hunting for rodents or from foraging grain spilled on the road or flying into electrical wires. Other causes of mortality could be the results of flying into glass or reflective glass windows (Klem 1990), caught in machinery, poisoned from rodenticides, pesticides, or sickened from petroleum based products spilled onto the ground that could have ingested, consuming small plastic or metal trash or other debris left scattered on the ground. Veterinarians refer to this as hardware disease, when it occurs in cattle, but has also been documented in canids, birds and whales. Bird mortality also is caused by feral cats and house pets, which contribute to millions of bird deaths each year.

Since the Altamont raptor mortality studies shared high mortality rates in that area, the California Energy Commission (CEC) developed a set of voluntary guidelines for reducing impacts to birds and bats from wind energy development (California Energy Commission and Department of Fish and Game 2007). The CEC guidelines identified a number of measures that can be used to minimize bird and bat mortality. Previous work conducted by Anderson *et al.* (2004) and Western Ecosystems Technology, Inc, (2011) in the Tehachapi wind farm region revealed that although bird mortalities occur, they are not as high as those recorded at other California wind farms.

The CCDLP has installed tall tubular towers, instead of the lattice towers, to avoid any migrating or residential birds and bat populations that may perch on the turbine and endanger their lives. The tower designs will assist in avoiding, minimizing or mitigating any possible dangers to the bird and bat populations. The towers are installed leeward from the ridges, without losing wind efficiency, to avoid the raptor's flight paths when hunting. In addition, there are often several precautions that are taken to avoid bird and bat mortality. Any broken wind turbines are immediately repaired and all turbines that are in a row are either turned on or off, so that flying birds or bats are not diverted into a working turbine blade. CCDLP has also chosen a turbine model that has an increased size in

1.2 Background (continued)

WTG, which slows down the speed of the blades, allowing birds or bats to divert around or travel between the blades if a turbine is in their flight path.

2 LOCATION

The CCDLP Project is located on undeveloped rangelands six miles west of the unincorporated community of Mojave, seven miles southeast of the City of Tehachapi, and five miles southeast of Tehachapi Pass, Kern County, CA (Figures 1-3). This project is located in Sections 7 and 15, Township 11 North, Range 13 West and rest of the project includes Section 11 and 12, Township 11 North Range 14 West in the Monolith quadrangle (SBB&M). The project sites are north of Oak Creek Road and east of Cameron Road. Primary access to the site is provided via Cameron and Oak Creek Roads. The CCDLP project was included in a zone change application submitted to Kern County on May 29, 2008, and the application was deemed complete by the County on June 12, 2008 (ZCC#40, Map 197; ZCC #58, Map 198; ZCC #24, Map 214).

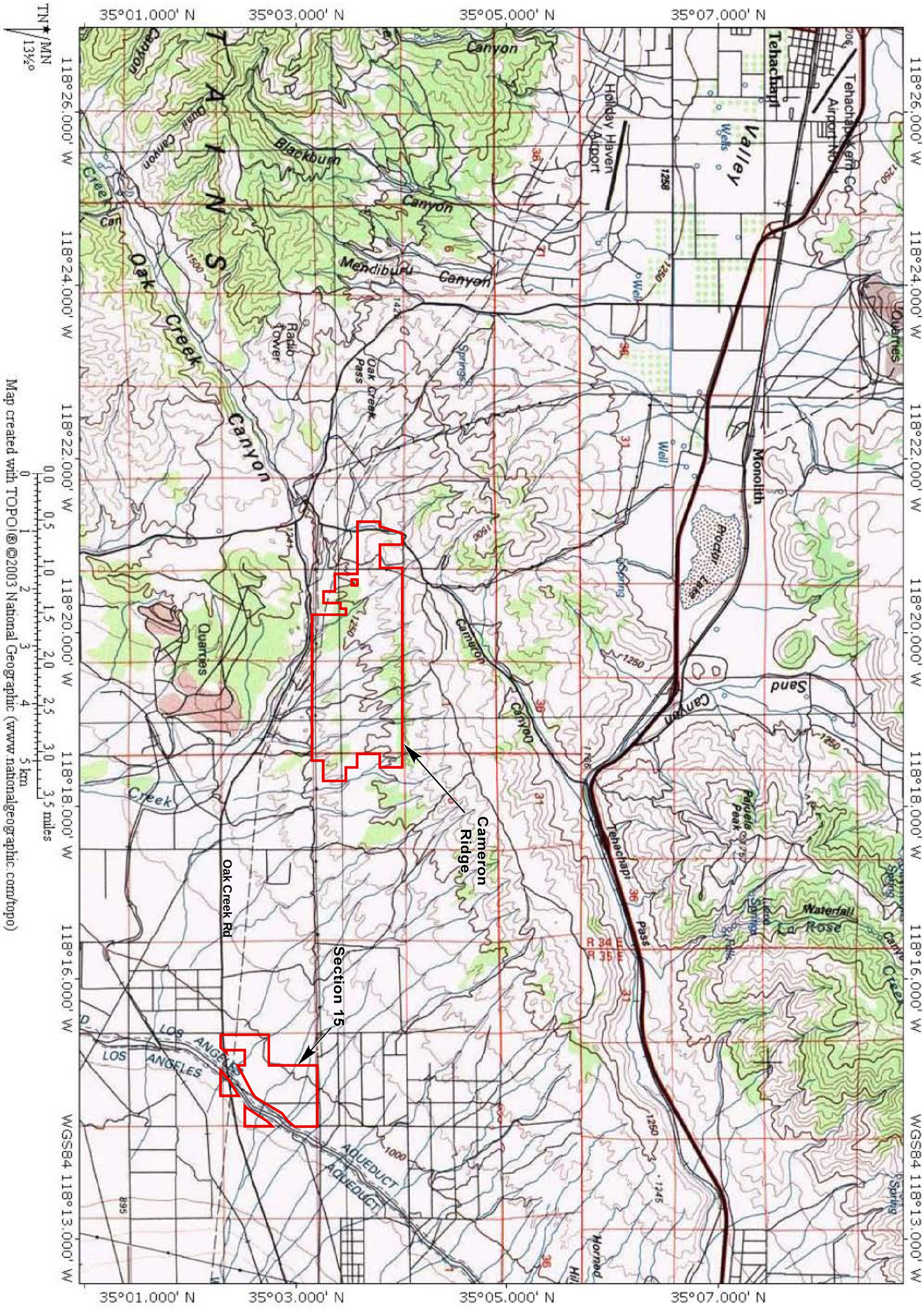
2.1 Existing Environment

On the adjacent lands surrounding the Project site are rural residential, ranching, industrial mining and commercial uses, recreation of private and public properties and U.S. military installations.

Based upon regional biological surveys such as, the Tehachapi Mountain Bird Club (1991-2005) lists and the Kern County Audubon bird checklist, the Cameron Ridge and Section 15 Wind Project sites are not believed to be located directly within a seasonal migratory route for birds. Bird migration routes in the region have been mapped to the extent that they are known (Figure 4) (Wolfe 2009).

The CCDLP wind energy facility is located on the leeward and south facing slope of Cameron Ridge which borders the northern side of the Oak Creek drainage. Habitat types include California annual grasslands (Sawyer and Keeler-Wolf 1995), mostly dominated by nonnative annual grasses, buckwheat and juniper. Mojave creosote scrub is also present on the Section 15 portion of the CCDLP project site.

Down slope and off site, the Oak Creek Canyon is not known to be a significant east/west migratory passage way for birds or other wildlife. Oak Creek Canyon supports habitats for local bird populations and is undoubtedly used by a variety of wildlife as a movement corridor, as are most drainages. The probability that Oak Creek Canyon represents a long range migratory route or migratory destination as a feeding or resting stop, like the South Fork of the Kern River or Buterbredt Springs, is unlikely. Some bird species, such as mountain bluebird and house finch may use the drainage for local seasonal elevational movement to



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Cameron Ridge and Section 15
General Project Locations

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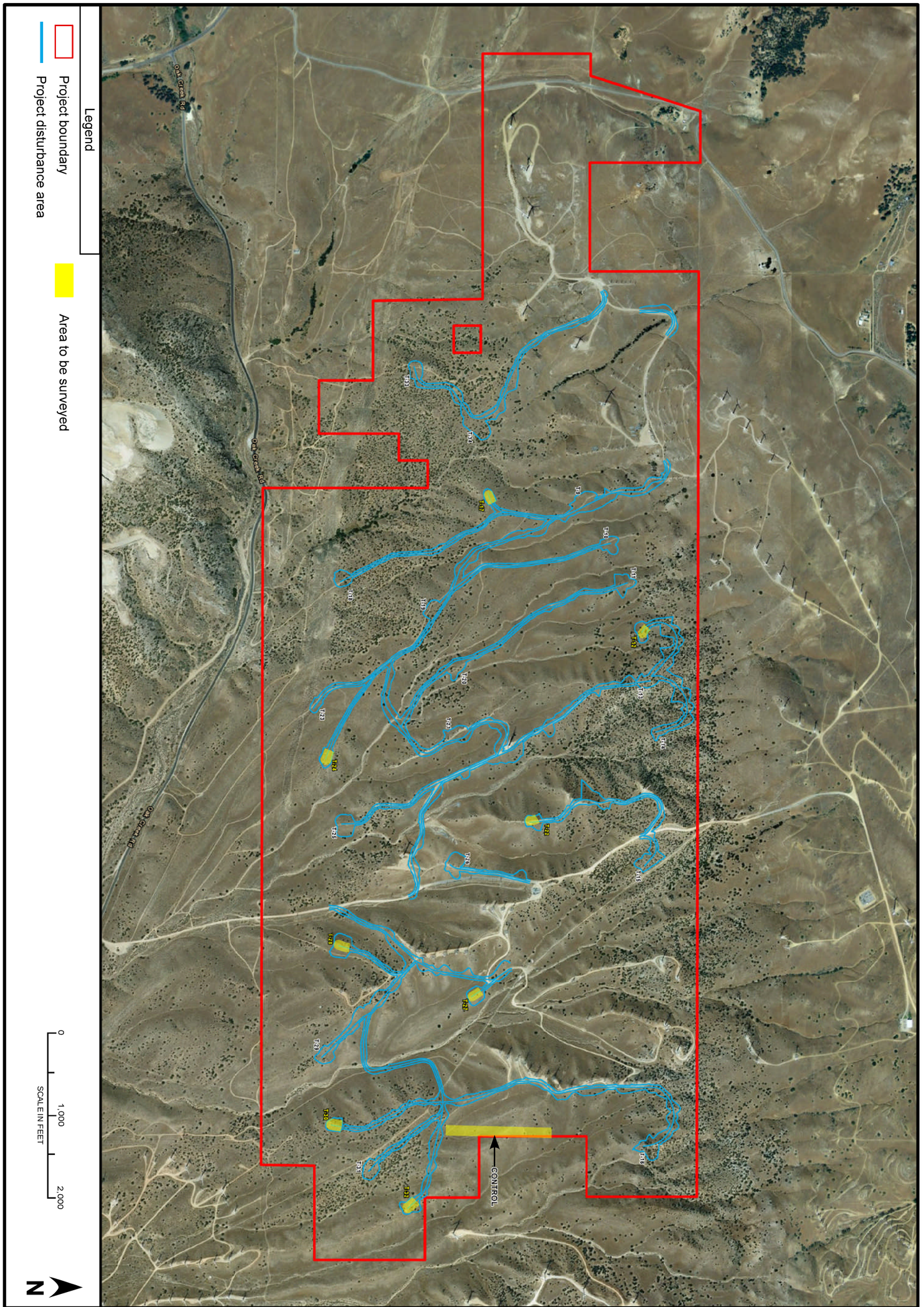

Cameron Ridge Project Boundary and Survey Locations

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FIGURE NO. 2

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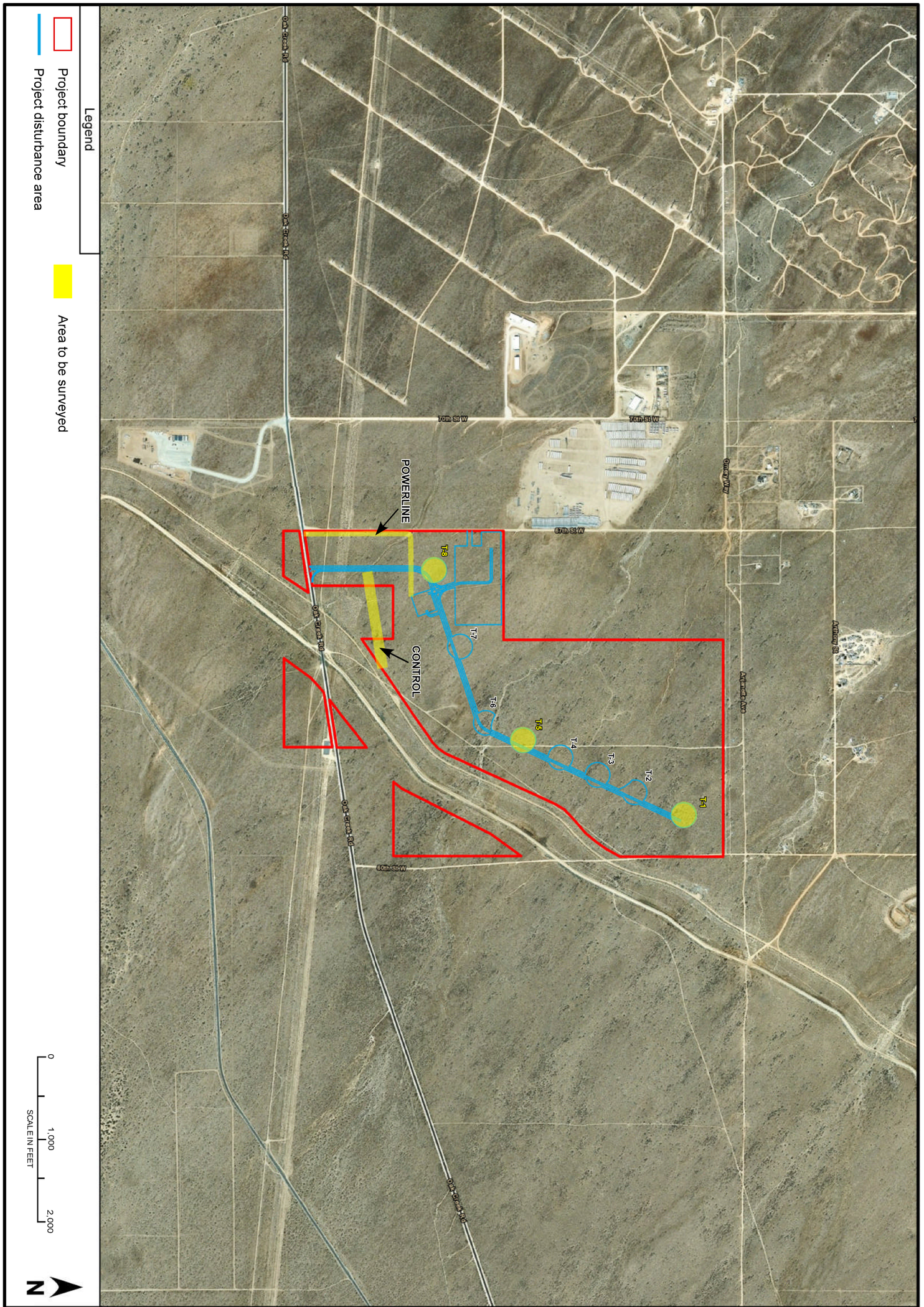

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Section 15 Project Boundary and Survey Locations

DATE: July 23, 2013

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Coram California Development, L.P.

FIGURE NO. 3

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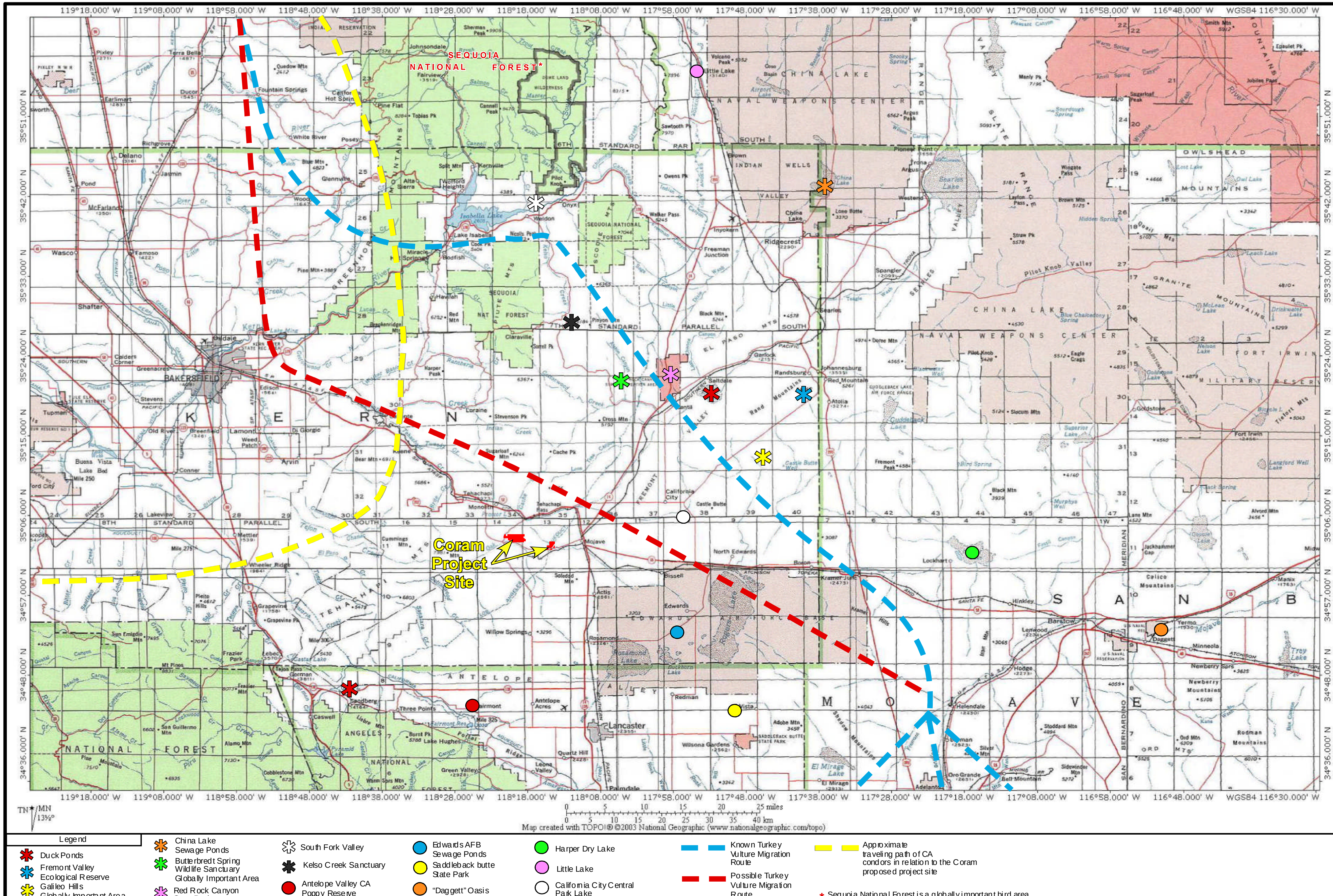

Locations of Special Avian Habitats and Migration Routes in Eastern Kern County

Avian Hotspots in the vicinity of the Coram California Development Project Site

FIGURE NO 4

DATE: April 2, 2012

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2.1 Existing Environment (continued)

the Mojave Desert, but it does not connect with the southern San Joaquin Valley or any other known north-south migratory route.

Some of the small rock outcrops within a mile of the project site may be used by bats as roosts. Although no cliffs or other suitable roosting on the areas for bats are present on the CCDLP project site itself, riparian shrub habitat within the project site and Oak Creek Canyon is potential bat foraging habitat. The extent to which bats that forage in Oak Creek Canyon also occur on the wind farm is largely unknown. Because of the anticipated low regional bat population densities (Brown 1996), the CCDLP wind farm is not anticipated to be a significant cause of bat mortalities.

The CCDLP project is not located at the top of a primary ridge, as many other wind farms are located. Furthermore, the wind farm is well below the highest point of Cameron Ridge, being down slope on the leeward side, bird and bat mortality is anticipated to be lower than most wind farms because of its topographical environment.

3 METHODS

Appropriate take permits for collecting dead birds were obtained from the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service. Protocol for bird and bat mortality monitoring was researched from other studies conducted in California (Anderson *et al.* 2004, Anderson and Estep 1988, Dorin and Spiegel 2005), studies in Oregon (Erickson *et al.* 2001), Minnesota (Higgins *et al.* 1995) and Netherlands (Winkelman 1985) and a BBM plan was developed by Wolfe (2012) that was consistent with the CEC guidelines. Bird and bat mortality on wind farms depends upon the size of the wind farm, the physiographic location, wind circulation patterns, accessibility, type of wind turbine generator (shape, height and length of blade), elevation, habitat types, proximity to water, regional migration routes and the location of special topographical features that may attract birds. The following summarizes the survey methods implemented and described in the BBM Plan.

3.1 Dates Defining Seasons

The bird and bat mortality monitoring survey used the following dates to define seasons within the one year (52 weeks) survey period. (Table 1)

Table 1. Season Period Definitions.

Season	Year	Dates
Spring	2012	May 1 to June 21
Summer	2012	June 22 to September 21
Fall	2012	September 22 to December 21
Winter	2012/2013	December 22 to March 21
Spring	2013	March 22 to April 30

3.2 Bird and Bat Mortality Study

The following section describes the methods involved in the Bird and Bat Mortality survey of the Cameron Ridge and Section 15 project. This includes the methods for a standardized search plot, size sampling, scavenger study, surveyor efficiency trials, and mortality estimations.

3.2.1 Search Plot Standardization

The search plots included those for turbines, power lines and controls. Turbine search plots were circular in shape with the turbine at the center. Turbines surveyed at the CDDLP project sites have a maximum rotor tip height of 410 feet (125 m); therefore, the search extended 205 feet (62.5 m) from the turbine on each side as stated in the California guidelines for reducing impacts to birds and bats from wind energy development (California Energy Commission and Department of Fish and Game 2007). The area of each turbine plot was about 2.9 acres (1.2 hectares).

Control plots were linear in shape with a minimum distance of 950 feet (290 m) away from the center of any turbine search plot. The control plot area for Cameron Ridge was 2.3 acres (0.95 hectares). The control plot area for Section 15 was 2.3 acres (0.95 hectares).

The power line search plot was L-shaped with a minimum distance of 475 feet (150 m) away from the center of any turbine search plot. The power line search plot for Section 15 was 2.7 acres (1.1 hectares).

3.2.2 Sampling Standardization

The sampling operation included 34 turbines (26 in Cameron Ridge and eight in Section 15) that were operational at any given point during the survey. Based on the CEC guidelines 33% of the turbines should be

3.2.2 Sampling Standardization (continued)

sampled. Systematic representation of topography for turbine plots included eight turbines on Cameron Ridge and three turbines on Section 15.

Approximately, 23 acres (9.5 hectares) of turbine search plot were surveyed at Cameron Ridge and 8.6 acres (3.5 hectares) of turbine search plot were surveyed at Section 15 during each survey period which was about 2 days per week. The eight turbine plots in Cameron Ridge consisted of approximately 73% of the turbine search area and the three turbine plots in Section 15 consisted of approximately 27% of the total turbine search area. A total of 572 turbine searches, approximately 1,643 acres (665 hectares) of turbine search area, were conducted at the CCDLP Wind Project from early May 2012 to late April 2013.

Approximately 239 acres (97 hectares) of control plot and 140 acres (57 hectares) of power line search plot were surveyed at the CCDLP Wind Project from May 2012 to April 2013. A total of 104 control line searches and 52 power line searches were conducted from May 2012 to April 2013.

3.2.3 Search Standardization

Prior to starting, technicians ("the surveyors") were trained in proper search and survey technique. Based on the Standardized search plot, transects were surveyed once every week (seven day interval) when possible using meandering transects to ensure almost 100 percent ground coverage. This timing was based upon the findings of the scavenger study conducted on the project site by Wolfe 2011/12. Turbine searches were conducted with 10 feet (3.1 m) transect separation in a circular fashion with the turbine at the center of the plot. Minimal radial distances of 205 feet from each turbine were searched. Search speed and area were accommodated by topography and habitat type. Search time ranged from 40 to 60 minutes per turbine based on topography and habitat type.

Mortalities determined to have been caused by the CCDLP Wind Project were included in the mortality estimates if one of the following criteria were met.

- Intact – a single intact carcass with minimal decomposition.
- Scavenged – a single carcass with signs of being fed upon by a predator or scavenger, including portions of a carcass (e.g. integument, bone, legs, wings, etc.).
- Feather Spot – 12 or more feathers at a single location was indication for predation or scavenging of a mortality.

3.2.3 Search Standardization (continued)

All discovered mortalities were recorded on the CCDLP Bird & Bat Mortality Report Form (Appendix A). The form was filled out in its entirety and includes a significant amount of physical, biological, climatic, location, and forensic data. All discoveries were photographed as found, ID labeled, bagged and species identity was later confirmed by qualified persons. A biologist was contacted if a mortality was discovered by construction and maintenance personnel.

Mortalities not associated with the wind project may be included in the mortality estimation if mortality cannot be reasonably determined. Mortality by predation, injuries (tree branch impalement, ground impact and strikes from high winds, old age, disease, etc.) and other natural causes occur on the site, but have not been studied. These mortalities may contribute to overestimation of wind project related mortality rates. For standard data reporting and analysis, mortalities within the turbine search plot area were assumed to be wind project related.

3.2.4 Searcher Efficiency Trials

Searcher Efficiency Trials were used to determine bird and bat detection rate. Trials were conducted in the standard search plots in the Cameron Ridge and Section 15 sites containing juniper woodland and creosote scrub habitat, respectively. Trials were conducted throughout the survey year. Searcher efficiency (observer detection bias) rates were used to adjust for carcass discovery. A minimal of 103 bird carcass per year, which ranged in size, were randomly distributed in any of the search plots in the CCDLP Wind Project.

Surveyor accuracy was tested with planted decoys of which the surveyors did not know the timing, size, type of bird or location. The decoys were usually collected dead birds, but also included bird parts. At the completion of the survey the percent efficiency was calculated and recorded using Erickson *et al*. (2004) adjustments.

3.2.5 Scavenger Study

Scavenger studies, that were conducted from November 14, 2010 to August 21, 2011, were used to determine the length of time bird and bat carcasses persist in the environment before they are completely removed from a search plot (by scavenging or other means) and the remaining number of carcasses at the end of seven days. Report forms were used to report and record persistence times. The data from the scavenger study was used to calculate the timing to be used for the mortality surveys. The frequency for mortality searches was determined to be no more than seven

3.2.5 Scavenger Study

days. Trials were conducted in each season of the survey year (i.e. four times per year). The frequency of scavenging rates were used to ensure carcass discovery and searcher efficiency.

Scavenger study carcasses were periodically monitored approximately every 12 hours (in the morning and evening) for seven days each season (once/quarter) for one year, to assess scavenging and removal rate. A variety of bird species were used in the study. The carcasses were removed from a freezer for 12 to 24 hours prior to placing the carcasses on the scavenger site.

The scavenger study consisted of 28 carcasses per quarter. Carcass plots were randomly distributed within Cameron Ridge (20) and Section 15 (eight). Scavenger sites accommodate the variety of land covers (Juniper woodland and creosote scrub) and topography within the CCDLP Wind Project.

3.3 Mortality Estimates

Wind project mortality is based on the following:

3.3.1 Turbine Mortality Rate ($\bar{c}$)

The turbine mortality rate was calculated as the mean of carcasses discovered from May 2012 to April 2013 (one year) on the standardized search plots (n).

Mean carcass observation can be defined as the sum of all carcasses (c_i) , discovered in the search plots for the survey period divided by the number of turbines searched (k).

$$\bar{c} = \frac{\left(\sum_{i=1}^{n} c_i\right)}{k}$$

3.3.2 Searcher Efficiency Rate ($\mathbf{p}$)

The searcher efficiency (%), during the entire survey period is the proportion (detection rate) of carcasses detected (or discovered) from the carcasses placed in the trial. Searcher efficiency rate was estimated by total survey period and by both the Cameron Ridge and Section 15 sites.

$$\sum_{x=0}^{w-1} l$$

3.3.3 Scavenger Rate ($\bar{t}$)

Mean probability a carcass is available to be found in the study area before it is removed by scavengers. Mean scavenging rate ($\bar{t}$) of bird carcasses in days can be defined as the sum of days (t_i) a carcass remains in a trial site before it is removed divided by the number of carcasses removed (s_r).

$$\bar{t} = \frac{(\sum_{i=1}^{s} t_i)}{s_r}$$

3.3.4 Annual Turbine Mortality Rate (m).

Annual mortality rate (m) per turbine can be defined as mean number of carcasses observed for one year ($\bar{c}$) divided by detection probability ($\hat{\pi}$) of a carcass that is available and discoverable.

Detection probability ($\hat{\pi}$) can be defined as:

$$\hat{\pi} = \frac{\bar{t} \cdot \mathbf{p}}{\mathbf{I}} \cdot \left[\frac{e^{\frac{\mathbf{I}}{\bar{t}}} - 1}{e^{\frac{\mathbf{I}}{\bar{t}}} - 1 + \mathbf{p}} \right]$$ (Shoenfeld 2004)

Where (I) is the standardized search interval.

4 RESULTS

The results of the bird and bat mortality monitoring in the CCDLP Wind Project site, with standardized mortality estimates, is based on one complete survey year from May 2012 to April 2013.

4.1 Bird Mortality in Survey Area

Bird mortalities discovered between May 2012 and April 2013 comprise of three feather spots (Appendix B). Two of the mortalities are associated with the standardized search plots and one was on a control line. In Cameron Ridge, one bird mortality was discovered in T-24 (Table 2). In Section 15, one bird mortality was discovered in T-8 and another in the control line at N 35° 02.460', W 118° 15.006'. The average distance from turbine mortality for the discovered birds was 125 feet (38 m).

4.1 Bird Mortality in Survey Area (continued)

Table 2. Bird Mortality Locations.

Species	Latitude	Longitude
Mourning dove feather spot	N 35° 02.988’	W 118° 15.015’
Mourning dove feather spot	N 35° 02.460’	W 118° 15.006’
Great horned owl feather spot	N 35° 03.295’	W 118° 19.999’

One great horned owl feather spot associated with Cameron Ridge and two mourning dove feather spots are associated with Section 15 (Table 2). One of the feather spots (Table 1) found on April 19, 2013 was identified to be a great horned owl found approximately 150 feet away from turbine 24 (T-24). One of the mourning dove feather spot was found approximately 100 feet away from turbine 8 (T-8) on April 11, 2013. The other mourning dove spot was found on April 11, 2013 on the control line of Section 15. The two mourning dove feather spots identified were located on the ground and the raptor feather spot was scattered on a shrub and the ground.

Not all of these bird feathers necessarily represent birds killed by CCDLP wind turbines. Determining the actual cause of death of these birds is difficult. No other bird carcasses were observed or located on the power line or control transects during the survey period except for offsite detection. This includes regular survey intervals.

4.2 Bird Mortality Outside Survey Area

A white crowned sparrow feather spot was found incidentally along Cameron Ridge Road outside the standardized search plots and survey interval at N 35°03’51.5”, W 118°20’40.4”, on October 23, 2012; reason for mortality is unknown. Additionally, an injured juvenile red-tailed hawk was found by the Brookfield safety officer while driving the site at N 35°03’51.88”, W 118°20’24.79”, on December 10, 2011. The injury did not occur from construction, but was observed on the ground by crew. A biologist was notified and took the red-tailed hawk to FACT (Facility for Animal Care and Treatment) for medical care.

4.3 Bat Mortality

No dead bats were observed or located on any of the transects at any time during this 12-month survey period, including regular survey intervals.

4.4 Searcher Efficiency Trials

Prior to a survey, qualified biologists placed a variety of dead birds ranging in different sizes (small, medium or large) out by the turbines, power lines or control areas. When surveys were complete for the day, the biologists was contacted to compare survey findings with trial placements.

A total of 103 trial carcasses were used in the efficiency trials. Over the course of five seasons, on both the Cameron Ridge and Section 15, detection rate of a carcass was at the lowest in Spring 2012 (45%) and at the highest in the Fall 2012 (92%). Overall, searcher efficiency for the entire CCDLP Wind Project for the survey period 2012/2013 was 80%.

4.5 Mortality Estimates

Mortality estimates were adjusted for searcher efficiency and scavenge removal. Based on the scavenger study conducted on the project site in the fall of 2010, 21 percent of all dead birds were scavenged by seven days. Consequently, based on this data to minimize error and adjustment multipliers, a sampling frequency of every seven days was conducted.

4.5.1 Bird Mortality Rate

Overall, the estimated number of bird mortalities per turbine per year for the CCDLP Wind Project calculated by the formula is 0.27 mortalities per turbine per year. Estimated bird mortalities for Cameron Ridge are 0.13 birds per turbine per year. Estimated bird mortalities for Section 15 are 0.33 per turbine per year. A mortality discovered on a control line of Section 15 is not deemed wind project related. By excluding this mortality, the estimate of overall bird mortality is 0.18 per turbine per year. Raptor mortality is estimated to be 0.09 per turbine per year at the CCDLP Wind Project. Some wind farm studies documented that raptor food sources, turbine sizes and turbine placement all directly affect raptor mortality. Wind farms like the Altamont Pass Wind Resource Area have a history of killing golden eagles, kestrels, burrowing owls and red-tailed hawks which is why raptor mortality is of particular concern for managing agencies.

4.5.2 Bat Mortality Rate

Estimated bat mortalities for CCDLP Wind Project are zero. No bat carcasses were detected on the transects or search plots at any time during this 12-month survey period.

5 DISCUSSION/CONCLUSION

The results of the bird and bat mortality monitoring in the CCDLP Wind Project site, with standardized mortality estimates, are based on one complete survey period from May 2012 to April 2013.

5.1 Bird Mortality

Bird mortalities discovered during the BBM surveys between May 2012 and April 2013 were comprised of three bird mortalities in the form of feather spots. Although two bird mortalities were discovered within turbine search plots, true cause of death is unknown.

Overall, the BBM survey results indicate that there was very low bird mortality on Cameron Ridge and Section 15. It is likely that since the site is located below the ridge top there are far less bird mortalities. Raptors use the wind up drafts, which flow windward up ridges, while hunting; they expend less energy for flying than necessary and are able to hunt for a longer period of time. Whereas, the project site is located on the leeward side and low wind up drafts flow through the turbine area. In the project site, while hunting, birds would be required to expel more energy to flying and have less time to hunt, because there is not enough wind up drafts to allow the birds to fly at a lesser energy cost. Therefore, while the birds are hunting it is more plausible and beneficial for them to be near the highest ridges where they are able to expel less energy for flying and hunt for a longer period of time. Consequently, the results for the low bird mortality rate are as anticipated, because the project site is located in areas that are below the up drafts on the top of the main ridge.

5.2 Bat Mortality

No dead bats were observed or located on any of the control transects at any time during this 12-month survey period, including regular survey intervals. Patterns of bat mortality are quite different than those of birds, making analysis of the results of bat mortality complicated (Arnett *et al.* 2008), or at least different than that of birds.

5.3 Additional Monitoring

The CEQA document requires bird and bat monitoring be conducted in the following years as referred to as years 3 and 4 of Project operation. In addition, a

12 month long scavenger survey is being conducted in 2013/2014 to see if construction has altered scavenging rates from preconstruction conditions.

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Appendix A. CCDLP Bird and Bat Mortality Report Form.

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Appendix B. CCDLP Bird and Bat Mortality Monitoring Data Sheets

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