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July 17, 2026
Dockett No: 26-OPT-01

Jon Boyer
Vaca Dixon BESS LLC and Arges BESS LLC
4350 Executive Drive, Suite 320
San Diego, California 92121

Subject: Crotch's Bumble Bee Survey Report for the Vaca Dixon Power Center Project in Solano County, California

Dear Mr. Boyer:

Rincon Consultants, Inc. (Rincon) has provided this Crotch's bumble bee (*Bombus crotchii*; CBB) survey report documenting the methods and results of CBB surveys conducted during the CBB Colony Active Period for the Vaca Dixon Power Center Project (Project) in Solano County. The required notification to conduct the Memorandum of Understanding (MOU) capture surveys for MOU Principal Investigator Stella Moore (SCP S-242390003-24239-001) was submitted to the California Department of Fish and Wildlife (CDFW) via email on April 17, 2026. The surveys concluded that CBB are not present within the Project site.

Project Description and Location

The proposed Vaca Dixon Power Center Project is made up of two major components: the battery energy storage system (BESS) facilities and transmission intertie (gen-tie) lines. The BESS facilities are proposed to be installed on an approximately 10-acre site, south of Interstate 80 (I-80) in the City of Vacaville in Solano County, California, within Assessor's Parcel Number (APN) 0133-060-060. The Project's proposed gen-tie lines cross I-80 to the north to connect the BESS facilities to the existing Pacific Gas & Electric (PG&E) Vaca-Dixon Substation located on the western portion of APN 0133-060-070 in unincorporated Solano County. This report provides findings specific to the portion of the Project Area north of I-80, where the overhead gen-tie lines are proposed. Though the proposed gen-tie corridor for this Project only encompasses a small portion of the parcel north of I-80, the CBB survey area was extended to include suitable CBB habitat within the western portion of the overall parcel to account for any future changes to Project design and ensure all potential impact areas were adequately surveyed.

The survey area is located on the border of the Sacramento Valley and Inner North Coast Ranges geographic subdivisions of California (Jepson Flora Project 2026) and within the *Allendale*, *California* United States Geological Survey (USGS) 7.5-minute topographic quadrangle. The Public Land Survey System depicts the survey area in Township 06 North, Range 01 West, Section 01, Mount Diablo Base and Meridian. The center point of the survey area is located at 38.39893°, -121.92335°. The survey area is bordered by backyards of residential areas to the west, PG&E facilities to the east, the I-80 corridor to the south, and Gibson Canyon Creek to the north. Adjacent land uses include agricultural land, PG&E facilities associated with the Vaca-Dixon Substation, and backyards of residential areas. Provided in Attachment 1, Figure 1 displays the regional location of the survey area, and Figure 2 displays the survey area boundary.

Survey Methodology

CBB surveys were conducted because potentially suitable nesting, foraging and overwintering habitat was determined to be present within the survey area. The CBB surveys described in this report were conducted in accordance with the CDFW Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species (CDFW Survey Considerations) document issued June 6, 2023

(CDFW 2023), and in compliance with the MOU (SCP S-242390003-24239-001) for CESA Candidate CBB issued by CDFW to Principal Investigator, Stella Moore, on February 24, 2025 (CDFW 2025). The required notification to conduct the MOU capture surveys was submitted to CDFW via email on April 17, 2026.

Survey Components

Surveys were conducted by biologists Stella Moore (lead surveyor) with Elise Gustilo (field assistant) and Isaac Krecger (field assistant), who were responsible for overseeing all aspects of the bumble bee surveys, including implementation of the survey methods, recording survey data and taking photographs.

A total of three survey days were completed within the Colony Active Period for CBB (April through August), per CDFW Survey Considerations (CDFW 2023). Each CBB survey incorporated the methodology for foraging bumble bee surveys, nesting surveys, and overwintering habitat surveys, further discussed below.

Foraging Bumble Bee Surveys

Foraging bumble bee surveys were conducted on each of the three survey days and consisted of bumble bee capture MOU surveys using meandering transects. The transect and surveyor spacing varied depending on the quality of the foraging habitat in any given area, with transects closer together in areas with a higher density of blooming floral resources and farther apart in areas with sparse or blooming floral resources. Floral species in bloom were noted and the percentage of floral resources available were assessed within the survey area. Floral species visited by each bumble bee captured or observed were also recorded during the foraging bumble bee capture MOU surveys. Bees that matched the candidate species description were captured with a net from blooming flora. Each bee was carefully transferred into a sterile vial and moved to a cooler. Once the bee was cooled, the bee was removed from the vial and photographs were captured for further identification to species and caste before being released. If the bee was not captured, photographs of the bee were taken as it feeds on blooming flora to the greatest extent possible. Every bumble bee, if captured, photographed, or simply observed during the surveys, was identified to species and caste to the greatest extent possible.

Nesting Surveys

Nesting surveys were conducted on each of the three survey days to assess the presence of suitable nesting resources, including rodent holes/tunnels, cavities within rock piles, brush piles, bunch grasses, leaf piles, pine needle duff, vegetation mulch. Potential nesting substrates were documented with representative photographs. Potential nesting sites were investigated for active CBB colonies by looking for concentrated bumble bee activity, and if a site was suspected to be occupied, it was observed to identify signs of bumble bees entering or exiting the entrance. If an active CBB colony were to be observed, the location, vegetation cover type, slope, aspect, and distance to colony foraging location was documented and photographed. Active CBB colonies, if present, were photographed at a distance to avoid any potential disturbance or encroachment.

Overwintering Habitat Surveys

Overwintering habitat surveys were conducted on each survey day to assess and document potential CBB overwintering habitat, including loose bare soil, leaf litter, pine needle duff, vegetation mulch, and bunch grasses. If observed, active bumble bee hibernacula was documented and photographed.

Surveyor Qualifications

The lead surveyor, Stella Moore, is authorized by CDFW MOU to capture, handle, examine, and photograph CBB individuals. Isaac Kreger and Elise Gustilo are qualified to survey bumble bees under the supervision

of a lead surveyor holding a valid MOU. The surveyors do not serve as CDFW certified taxonomists, therefore all photographed bees were examined and verified by certified taxonomist Amber Nichols (SCP S-241140001-24114-001), following the survey effort. Resumes for staff are provided in Attachment 2.

Survey Effort and Timing

Two biologists were present during each survey day and included a minimum of one person-hour of searching per three acres of suitable habitat. The CBB surveys were conducted within the survey area, consisting of approximately 15 acres of suitable CBB habitat, where accessible.

A total of three surveys were conducted between 2 to 3 weeks apart during the Colony Active Period for CBB (April through August). Please refer to Table 1 below for a summary of the survey dates, surveyors, start/end survey times, and search hours.

Table 1 CBB Survey Dates, Surveyors, and Person-Hours of Searching

Survey	Dates	Surveyors	24-hour Time (start/ end)	Searching Time (hours) Per Person	Person-Hours of Searching
1	5/14/2026	Stella Moore, Elise Gustilo	0815/1115	2.5	5
2	6/3/2026	Stella Moore, Isaac Kreger	0815/1100	2.5	5
3	6/17/2026	Stella Moore, Elise Gustilo	0800/1045	2.5	5

Data Collection

Survey timing, weather conditions, floral resource assessment notes, nesting habitat assessment notes, overwintering habitat assessment notes, and bumble bee observations and active nest observations (if any were observed) were recorded on a data sheet for data accuracy and consistency.

Capture MOU surveys were conducted following the CA Bumble Bee Atlas non-lethal protocol (Xerces 2024). For all bumble bees captured during the surveys, photographs were taken of each bumble bee for further identification analysis and whenever possible included photographs of the following bumble bee morphology: (1) top overview of bee, (2) side view of bee depicting mandible length and hair phenology of thorax and abdomen, (3) face and vertex, (4) tip of abdomen, (5) close-up view of hind tibia, and (6) underneath of bee. Representative photos of each species captured are proved in Attachment 3. For bumble bees that were observed but unable to be captured, species identifications were made whenever possible and were based on bumble bee color morphology.

Survey Results

This section describes the results of the CBB surveys conducted within the survey area.

Vegetation Communities Within The Survey Area

The survey area consisted primarily of non-native annual grassland that is regularly maintained by the property owner for fuel reduction (e.g., mowing and/or herbicides). These areas are disturbed and some areas were void of vegetation. Where vegetation was present, the plant composition was dominated by ruderal species indicative of disturbance, such as ripgut brome (*Bromus diandrus*), summer mustard (*Hirschfeldia incana*) and hairy vetch (*Vicia villosa*).

Weather Conditions

Surveys were conducted when weather conditions were suitable for bumble bee activity, on warm, sunny days with low wind. Surveys began no earlier than one hour after sunrise and were completed at least two hours before sunset. Surveys were conducted when air temperatures ranged from 60 degrees Fahrenheit (°F) to 95°F, and when winds were less than 8 miles per hour (mph). Surveys were not conducted during wet conditions (e.g., foggy, raining, or drizzling) and when cloud cover was 100 percent. The weather conditions during the survey effort is summarized in Table 2 below.

Table 2 CBB Survey Weather Conditions

Survey	Date	24-hour Time (start/end)	Begin Air Temp (°F)	End Air Temp (°F)	Begin Wind Speed (MPH)	End Wind Speed (MPH)	Begin Cloud Cover (%)	End Cloud Cover (%)
1	5/14/2026	0815/1115	66	76	0-2	2-7	0	0
2	6/3/2026	0815/1100	65	74	4-6	6-8	0	0
3	6/17/2026	0800/1045	68	78	2-5	5-8	0	0

Foraging Bumble Bee Surveys

Bumble Bees Observed

Two species of bumble bees (*Bombus* spp.) were identified during the survey effort and captured during all three surveys. Bumble bee species captured and photographed included golden northern bumble bee (*Bombus fervidus*) and yellow-faced bumble bee (*Bombus vosnesenkii*). Bumble bees were observed to be foraging on several different floral resources within the survey area and are listed in Table 3 below. Photographs of the captured bumble bees are illustrated in Photographs 7-9 in Attachment 3.

Floral Resources Available

A total of 15 floral species were in bloom during the surveys, with eight observed being visited by bumble bees, summarized in Table 3 below. Approximately 5 percent of the survey area had floral resources available during the surveys. Representative photographs of blooming floral resources observed within the survey area are provided in Attachment 3, Photographs 4-6.

Table 3 Floral Species in Bloom During CBB Surveys and Bumble Bee Species Observed Visiting

Scientific Name[1]	Common Name	Bumble Bee Species Observed Visiting
Amsinckia intermedia	common fiddleneck	-
Asclepias fascicularis	narrowleaf milkweed	*Bombus fervidus*
Brodiaea elegans	harvest brodiaea	-
Carduus pycnocephalus	Italian thistle	-
Conium maculatum	poison hemlock	-
Convolvulus arvensis	field bindweed	*Bombus fervidus*
Erodium botrys	Mediterranean stork's bill	-
Gamochaeta californica	California cudweed	-
Hirschfeldia incana	summer mustard	*Bombus fervidus*
Phalaris aquatica	Harding grass	-
Plantago lanceolata	ribwort plantain	-
Proboscidea louisianica	common devil's claw	
Raphanus raphanistrum	wild radish	-
Sonchus asper	prickly sowthistle	-
Vicia villosa	hairy vetch	*Bombus fervidus*, *Bombus vosnesenskii*

Nesting Surveys

Potential CBB nesting substrates identified in the survey area included small mammal burrows and tunnels and areas of vegetation mulch. Potential nesting substrates were surveyed and documented with representative photographs (Attachment 3, Photographs 1-3). No potentially active CBB nesting sites were observed during the surveys.

Overwintering Habitat Surveys

Potential CBB overwintering habitat was assessed and documented within the survey area and included small mammal burrows and associated tunnels and areas of vegetation mulch. Potential overwintering habitats in the survey area were documented with representative photographs (Attachment 3, Photographs 2-3). The surveys occurred during the CBB Colony Active Period, and thus no bumble bee hibernacula were observed during the surveys.

Conclusion

Suitable CBB nesting, foraging, and overwintering habitat was identified within the survey area during the May/June 2026 survey effort during the Colony Active Period. No CBB were detected, which suggests absence within the survey area. The CBB survey results are valid until June 17, 2027 (one year after the date of the surveys).

Rincon is committed to providing exceptional surveying and reporting services for this Project. Please contact Rincon's Supervising Biologist, Thea Benson at 805-423-8443, or tbenson@rinconconsultants.com, if you have any questions or need any additional information.

Sincerely,
Rincon Consultants, Inc.

Stella Moore
Biologist/CBB Surveyor

Thea Benson
Senior Biologist/Project Manager

Attachments

Attachment 1	Figures
Attachment 2	Resumes
Attachment 3	Site Photographs

References

California Department of Fish and Wildlife (CDFW). 2023. Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=213150&inline

_____. 2025. Memorandum of Understanding (MOU) for CESA Candidate Crotch's bumble bee (*Bombus crotchii*), western bumble bee (*Bombus occidentalis*). MOU SCP S-242390003-24239-001 issued to Principal Investigator, Stella Moore, on February 24, 2025.

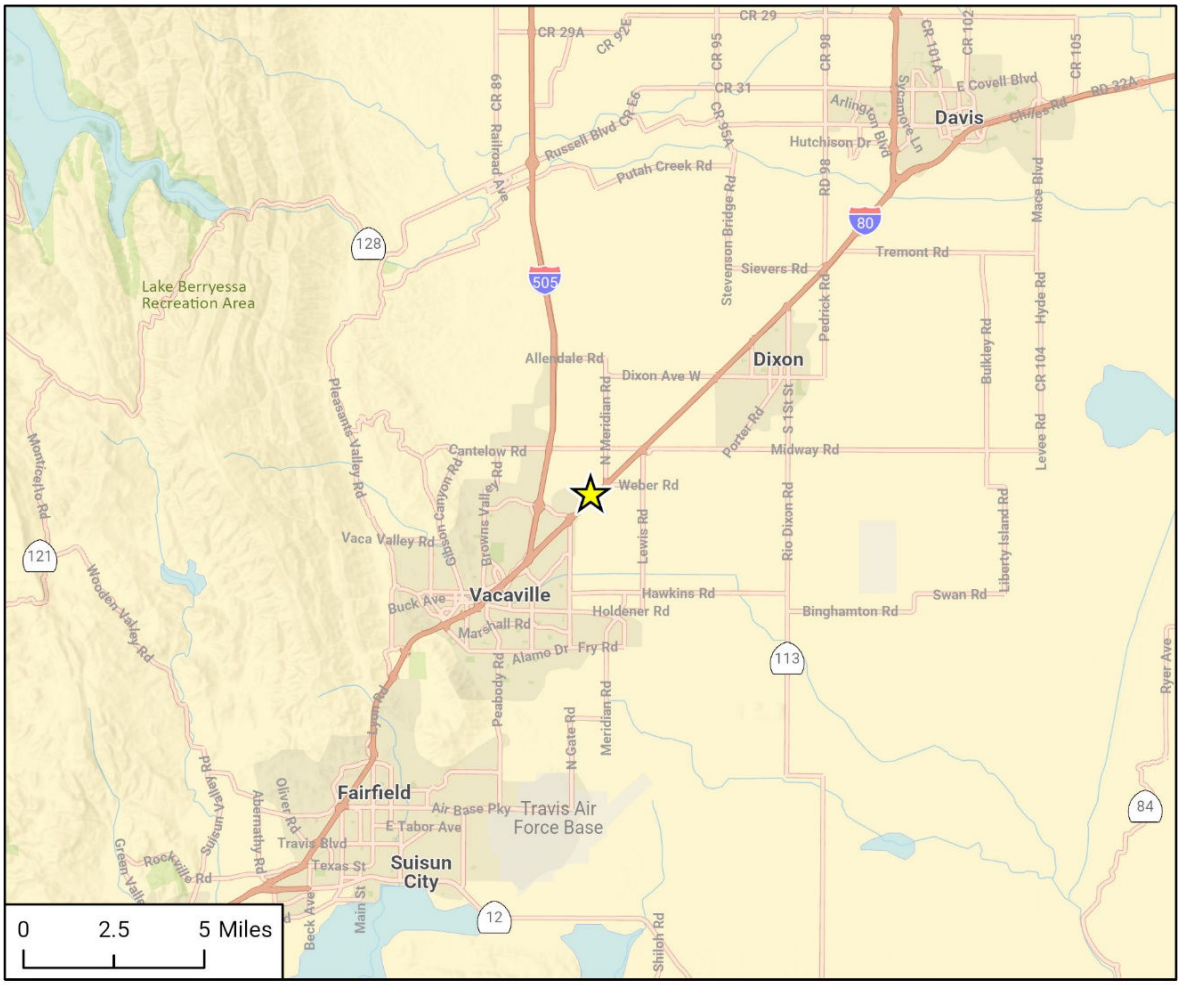
Google Earth Pro. 2026. Earth Version 7.3.7.1155.

Xerces Society for Invertebrate Conservation. 2024. California Bumble Bee Atlas Non-lethal Protocol: Point Surveys (Volunteer Handbook). Available at: https://www.cabumblebeeatlas.org/point-surveys.html

Attachment 1

Figures

Figure 1 Regional Location



Basemap provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.

25_17851 Bio
Fig 1 Regional Location

Project Location

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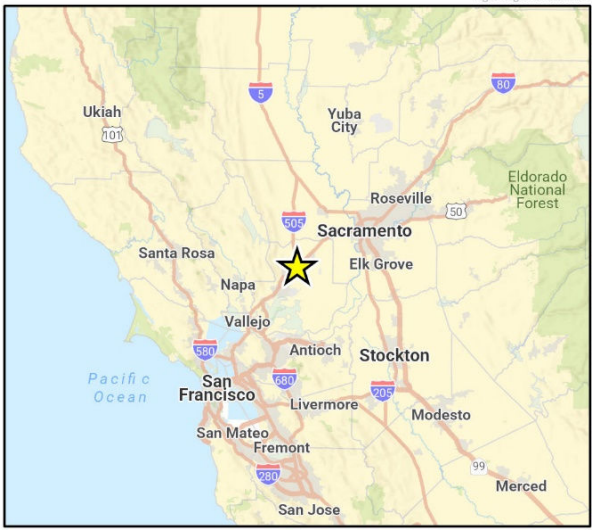

Figure 2 Survey Area

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Fig 2 Suitable CBB Habitat

Attachment 2

Resumes

Attachment 3

Site Photographs

Photograph 1. Cavities within a fallen tree suitable for CBB nesting within the survey area (aspect: west, May 14, 2026).

Photograph 2. Rodent burrows suitable for CBB nesting/overwintering within the survey area (aspect: north, June 17, 2026).

Photograph 3. Vegetation detritus suitable for CBB nesting/overwintering within the survey area (aspect: northwest, May 14, 2026).

Photograph 4. View of suitable floral resources for CBB foraging within the survey area (aspect: southwest, May 14, 2026).

Photograph 5. View of suitable floral resources for CBB foraging within the survey area (aspect: west, May 14, 2026).

Photograph 6. View of suitable floral resources for CBB foraging within the survey area (aspect: west, June 17, 2026).

Photograph 7. Photo of a *B. fervidus* female photographed on May 14, 2026 within the survey area.

Photograph 8. Photo of a *B. fervidus* male photographed on May 14, 2026 within the survey area.

Photograph 9. Photo of a *B. vosnesenskii* female photographed on May 14, 2026 within the survey area.