PLANNING COMMISSION

Meeting Date: __05/19/2025____

ADDITIONAL ITEM ADDED AFTER DISTRIBUTION OF PACKET (#1)

AGENDA ITEM # __3___

Applicant/Project Name: Armorlite Lofts
Project Number: EIR24-003, SP23-0001, GPA23-0002, R23-0001, SDP23-0003 & CUP23-0002

Brief Description: Comment Letter from Lozeau Drury LLP on behalf of SAFER.

Date __05/20/2025___
Time _8:50 a.m.__

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May 19, 2025

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Re: Comment on Environmental Impact Report, Armorlite Lofts Project (SCH 2024020372), Item No. 3 at May 19, 2025 Planning Commission Hearing

Dear Honorable Commissioners and Mr. Del Solar:

This comment is submitted on behalf of Supporters Alliance for Environmental Responsibility ("SAFER") regarding the Environmental Impact Report ("EIR") prepared for the Armorlite Lofts Project, which proposes the construction of a 165-unit mixed-use development at Armorlite Drive and Las Posas Road in the City of San Marcos ("Project").

After reviewing the DEIR and FEIR, SAFER is concerned that the EIR fails to adequately analyze significant environmental impacts, fails to mitigate significant impacts that will occur as a result of the Project, and fails to adequately respond to comments received on the DEIR. SAFER requests that the Planning Commission (the "Commission") refrain from recommending certification of the EIR at this time and instead request staff to reconsider the analyses and require additional mitigation measures in order to address the Project's significant impacts.

I. Project Description

The Project is proposed for a 2.44-acre site located at 225 N. Ls Posas Road. The site is located on the north side of Armorlite Drive, generally between N. Las Posas Road to the west and Bingham Drive to the east, within the Business/Industrial District in the City of San Marcos ("City"). The project site is approximately 0.25 miles north of State Route 78 and adjacent to the NCTD SPRINTER Palomar College Station. The Project' assessor parcel number is 219-162-62-00.

The Project applicant is requesting approval of a Specific Plan (SP23-0001), General Plan Amendment (GPA23-0002), Rezone (R23-0001), Site Development Plan (SDP23-0003) and a Conditional Use Permit (CUP23-0002). If approved, these entitlements would allow for the development of a 246,323 square foot (s.f.) building containing 165 apartment units and 5,600 square feet s.f. of commercial use.

II. Legal Background

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited circumstances). (See, e.g., Pub. Res. Code § 21100.) The EIR is the very heart of CEQA. (*Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652.) "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." (*Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 109.)

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project. (14 Cal. Code Regs. ("CEQA Guidelines") § 15002(a)(1).) "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'" (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564) The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." (*Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs*. (2001) 91 Cal. App. 4th 1344, 1354 ("Berkeley Jets"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810)

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures. (CEQA Guidelines § 15002(a)(2) and (3); *see also*, *Berkeley Jets*, *supra*, 91 Cal. App. 4th at pp. 1344, 1354; *Citizens of Goleta Valley*, *supra*, 52 Cal.3d at 564.) The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be

avoided or significantly reduced." (Guidelines §15002(a)(2)) If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." (Pub.Res.Code § 21081; 14 Cal.Code Regs. § 15092(b)(2)(A) & (B)) The lead agency may deem a particular impact to be insignificant only if it produces rigorous analysis and concrete substantial evidence justifying the finding. (*Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 732.).

While the courts review an EIR using an "abuse of discretion" standard, "the reviewing court is not to 'uncritically rely on every study or analysis presented by a project proponent in support of its position. A 'clearly inadequate or unsupported study is entitled to no judicial deference.'" (*Berkeley Jets*, *supra*, 91 Cal. App. 4th at p. 1355 [emphasis added] [quoting *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 391 409, fn. 12].) As the court stated in *Berkeley Jets*:

> A prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process." (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 722; *Galante Vineyards v. Monterey Peninsula Water Management Dist*. (1997) 60 Cal. App. 4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 946.)

More recently, the California Supreme Court has emphasized that:

> When reviewing whether a discussion is sufficient to satisfy CEQA, a court must be satisfied that the EIR (1) includes sufficient detail to enable those who did not participate in its preparation to understand and to consider meaningfully the issues the proposed project raises [citation omitted], and (2) makes a reasonable effort to substantively connect a project's air quality impacts to likely health consequences.

(*Sierra Club v. Cty. of Fresno* (2018) 6 Cal.5th 502, 510 (2018), citing *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 405.) "Whether or not the alleged inadequacy is the complete omission of a required discussion or a patently inadequate one-paragraph discussion devoid of analysis, the reviewing court must decide whether the EIR serves its purpose as an informational document." (*Sierra Club v. Cty. of Fresno*, *supra*, 6 Cal.5th at 516.) Although an agency has discretion to decide the manner of discussing potentially significant effects in an EIR, "a reviewing court must determine whether the discussion of a potentially significant effect is sufficient or insufficient, i.e., whether the EIR comports with its intended function of including 'detail sufficient to enable those who did not participate in its preparation to understand and to

consider meaningfully the issues raised by the proposed project.'" (6 Cal.5th at 516, citing *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1197.) "The determination whether a discussion is sufficient is not solely a matter of discerning whether there is substantial evidence to support the agency's factual conclusions." (6 Cal.5th at 516.) Whether a discussion of a potential impact is sufficient "presents a mixed question of law and fact. As such, it is generally subject to independent review. However, underlying factual determinations—including, for example, an agency's decision as to which methodologies to employ for analyzing an environmental effect—may warrant deference." (*Sierra Club v. Cty. of Fresno*, 6 Cal.5th at 516.) As the Court emphasized:

> [W]hether a description of an environmental impact is insufficient because it lacks analysis or omits the magnitude of the impact is not a substantial evidence question. A conclusory discussion of an environmental impact that an EIR deems significant can be determined by a court to be inadequate as an informational document without reference to substantial evidence.

(*Sierra Club v. Cty. of Fresno*, 6 Cal.5th at 514.)

III. Analysis

a. The EIR Fails to Analyze Indoor Air Quality Impacts.

We submit herewith the comments of indoor air quality expert, Francis Offermann, PE, CIH. Mr. Offermann, a Certified Industrial Hygienist and Professional Mechanical Engineer, concludes that it is likely that the Project will expose future residents to significant impacts related to indoor air quality, and in particular, emissions for the cancer-causing chemical formaldehyde. Mr. Offermann is one of the world's leading experts on indoor air quality and has published extensively on the topic. Mr. Offerman's comment letter and curriculum vitae are attached as Exhibit A.

Mr. Offermann explains that many composite wood products typically used in modern home construction contain formaldehyde-based glues which off-gas formaldehyde over a very long time period. He states, "The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and particle board. These materials are commonly used in residential building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims." (Ex. A, pp. 2-3.)

Formaldehyde is a known human carcinogen. Mr. Offermann states that that residents of the Project likely will be exposed to a cancer risk from formaldehyde of at least 120 per million. (Ex. A, p. 4.) This is far above the California Office of Environmental Health Hazard Assessment's ("OEHHA") CEQA significance threshold for airborne cancer risk of

10 per million. Mr. Offermann's cancer risk calculation of 120 in a million assumes the Project will use current "CARB-compliant" materials. (Ex. A, p. 3.)

The CARB requirements are known as the Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products (Formaldehyde ATCM"). (17 Cal.Code Regs. § 93120-93120.12.) The need for these regulations was based in large part on data collected by Mr. Offermann and a study he published in 2009 known as the California New Homes Study. (*See* Ex. A, p. 2.) Composite wood products include hardwood plywood, particleboard ("PB"), and medium density fiberboard ("MDF"). (*Id*., § 93120(b); § 93120.1(a)(8).) The rules rely on prohibiting the sale, distribution, supply, or manufacturing of plywood, PB, and MDF that exceed formaldehyde emission standards established by the rule. (*Id*., § 93120.2(a).). The standards were phased in over a period of years. By January 1, 2009, composite wood products had to comply with the Phase 1 emission standards established for each type of product. (*Id*., § 93120.2(a) (a certain category of hardwood plywood products had until July 1, 2009, to meet the standard applicable to those products).). Each product category then had several years to comply with a lower Phase 2 standard. (*Id*., § 93120.2(a).). Thus, by January 1, 2010, no hardwood plywood with a veneer core could be sold in California without meeting its Phase 2 formaldehyde emission standard. (*Id*.) Particle board and MDF products had to comply with their Phase 2 standard by January 1, 2011. Than MDF had to comply with its applicable standard by January 1, 2012. (*Id*.) The remaining plywoods with composite cores had to comply no later than July 1, 2012. (*Id*.)

Mr. Offermann can state with confidence that residences using materials that comply with the Phase 2 formaldehyde emissions standards will pose significant cancer risks based on his review of a follow-up study to his 2009 New Homes study as well as his own extensive experience studying and evaluating formaldehyde emissions from products and buildings. In 2016 through 2018, Chan et. al., measured formaldehyde levels in homes built with materials that were subject to the Phase 2 emission standards between 2011 and 2015. Mr. Offermann's expert comments are substantial evidence that the Project may have significant health risks on future residents from its emissions of formaldehyde. The EIR must be revised and recirculated to analyze and mitigate this significant impact.

The failure of the EIR to address the Project's formaldehyde emissions is contrary to the California Supreme Court's decision in *California Building Industry Ass'n v. Bay Area Air Quality Mgmt. Dist.* (2015) 62 Cal.4th 369, 386 ("*CBIA"*). In that case, the Supreme Court expressly holds that potential adverse impacts to future users and residents from pollution generated by a proposed project ***must be addressed*** under CEQA. At issue in *CBIA* was whether the Air District could enact CEQA guidelines that advised lead agencies that they must analyze the impacts of adjacent environmental conditions on a project. The Supreme Court held that CEQA does not generally require lead agencies to consider the environment's effects on a project. (*CBIA*, 62 Cal.4th at 800-801.) However, to the extent a project may exacerbate existing environmental conditions at or near a project site, those would still have to be considered pursuant to CEQA. (*Id*. at 801.) In so holding, the Court

expressly held that CEQA's statutory language required lead agencies to disclose and analyze "impacts on ***a project's users or residents*** that arise ***from the project's effects*** on the environment." (*Id*. at 800 (emphasis added).)

The carcinogenic formaldehyde emissions identified by Mr. Offermann are not an existing environmental condition. Those emissions to the air will be from the Project. People will be residing in and using the Project once it is built and begins emitting formaldehyde. Once built, the Project will begin to emit formaldehyde at levels that pose significant health risks. The Supreme Court in *CBIA* expressly finds that this type of air emission and health impact by the project on the environment and a "project's users and residents" must be addressed in the CEQA process.

The Supreme Court's reasoning is well-grounded in CEQA's statutory language. CEQA expressly includes a project's effects on human beings as an effect on the environment that must be addressed in an environmental review. "Section 21083(b)(3)'s express language, for example, requires a finding of a 'significant effect on the environment' (§ 21083(b)) whenever the 'environmental effects of a project will cause substantial adverse effects *on human beings,* either directly or indirectly.'" (*CBIA*, 62 Cal.4th at 800 (emphasis in original.) Likewise, "the Legislature has made clear—in declarations accompanying CEQA's enactment—that public health and safety are of great importance in the statutory scheme." (*Id*., citing e.g., §§ 21000, subds. (b), (c), (d), (g), 21001, subds. (b), (d).) It goes without saying that the hundreds of future residents at the Project are human beings and the health and safety of those residents is as important to CEQA's safeguards as nearby residents currently living adjacent to the Project site.

When a Project exceeds a duly adopted CEQA significance threshold, as here, this alone establishes a fair argument that the project will have a significant adverse environmental impact and an EIR is required. Indeed, in many instances, such air quality thresholds are the only criteria reviewed and treated as dispositive in evaluating the significance of a project's air quality impacts. (*See*, *e.g. Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 960 [County applies BAAQMD's "published CEQA quantitative criteria" and "threshold level of cumulative significance"]; *see also*, *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 110-111 ["A 'threshold of significance' for a given environmental effect is simply that level at which the lead agency finds the effects of the project to be significant."].) The California Supreme Court made clear the substantial importance that an air district significance threshold plays in providing substantial evidence of a significant adverse impact. (*Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 327 ["As the [South Coast Air Quality Management] District's established significance threshold for NOx is 55 pounds per day, these estimates [of NOx emissions of 201 to 456 pounds per day] constitute substantial evidence supporting a fair argument for a significant adverse impact."].) Since expert evidence demonstrates that the Project will exceed the OEHHA's CEQA significance threshold, there is substantial evidence of a fair argument that the Project

will have a significant adverse effect. Because this potential significant effect was not addressed at all in the EIR, it fails as an informational document and fails to provide substantial evidence that there will not be significant impacts on human health due to indoor air pollution emissions.

Mr. Offermann suggests several feasible mitigation measures, such as requiring the use of no-added-formaldehyde composite wood products, which are readily available. Mr. Offermann also suggests requiring air ventilation systems which would reduce formaldehyde levels. Since the EIR does not analyze this impact at all, none of these or other mitigation measures have been considered.

b. The EIR Fails to Adequately Analyze and Mitigate Impact to Biological Resources.

Wildlife ecologist, Dr. Shawn Smallwood, Ph.D. concludes that the Project will have adverse biological impacts. Dr. Smallwood's associate, wildlife biologist Noriko Smallwood, MS, conducted a site visit on May 2, 2025, for 3.72 hours. Ms. Smallwood detected 26 species of vertebrate wildlife at or adjacent to the project site, including three species with special status, including the Vaux's swift, Cooper's hawk, and Yellow warbler. Dr. Smallwood's expert comment is attached as Exhibit B.

1. The EIR's Characterization of the Environmental Setting is Inadequate and Ignores Potential Impacts to Special-Status Species

CEQA's primary objective is to disclose potential environmental impacts of a proposed project. The DEIR includes a wildlife survey from Dudek (2024). For a variety of reasons outlined by Dr. Smallwood, the wildlife reconnaissance survey reported in the DEIR is inadequate to provide an accurate description of the Project site's environmental setting.

First, the survey began at 15:00 hours, which is a time of day when wildlife activity is at its lowest. (Smallwood at 13). The DEIR reports "A total of 16 wildlife species were observed at the project site, all of which consisted of native species." (DEIR, at 3.3-7) Dr. Smallwood points out that the survey should have cited the native status of these species as evidence that the Project site is ecologically intact and in reasonably good condition. Ms. Smallwood only detected one non-native species, reinforcing the evidence that the site is largely intact and in good ecological condition.

Another issue with the DEIR's wildlife survey is that Dudek's biologist detected a significantly more limited array of species than Ms. Smallwood's survey. Dr. Smallwood's calculations show that the index of similarity between the studies was very low, with Dudek's survey detecting significantly less species. Further, even the combined number of observed species between both surveys is much fewer than the wildlife community of the

Project site. (Smallwood at 13.)

Dr. Smallwood also reports that the exact same list of species detected is reported by Dudek's survey and Muri's 2023 California gnatcatcher surveys, which is a highly unlikely outcome. (Smallwood at 13.) The United States Fish and Wildlife Service ("USFWS") 1997 Guidelines stipulate the need for breeding season surveys. Muri's survey mostly achieved the minimum USFWS standards, although there is no indication that USFWS was notified in advance, nor were breeding season surveys completed.

The DEIR also reports that "Due to a lack of suitable habitat, no other focused special-status wildlife species were conducted within the project site." (DEIR, at 3.3-8). In addition, Dudek's 2024 survey claims that "no other listed species have a moderate to high potential to occur on site," which was refuted by Ms. Smallwood's detection of three special-status species on the Project site. In addition, as noted in CDFW's comment letter, there should have been focused special-status wildlife surveys for Crotch's bumble bee, Dulzura pocket mouse, and northwester San Diego pocket mouse. Given that Ms. Smallwood disproved the assumptions of Dudek's 2024 survey in a single survey, additional focused surveys for special-status species are warranted.

Similarly, no surveys for bats were completed. Dudek's survey reasoned that bats would not roost on site due to its small size and lack of cliffs. However, Dr. Smallwood points out that this reasoning is misleading and unfounded, because bats roost on many substrates other than cliffs, and range over much larger areas than the area of the Project site. Dr. Smallwood notes that bats "undoubtedly" forage in the Project's surrounding area. (Smallwood at 14). The EIR should be revised to include a survey for bats.

Dr. Smallwood also observed issues with the DEIR's desktop review of habitat assessments. According to Dudek's 2024 survey, "[t]he proposed Project site does not support any special-status wildlife species and none are considered as having a moderate or high potential to occur; therefore construction of the project will not result in direct or indirect impacts to any special-status wildlife species."

Special status species are those which "may be ***protected*** as threatened or endangered ***under state or federal law*** or are ***otherwise being tracked by the California Department of Fish and Wildlife (or the United States Fish and Wildlife Service)*** or a private organization such as the California Native Plant Society ***because the species are declining at a rate that could lead to their being listed*** or are otherwise sufficiently rare or threatened enough to warrant monitoring." (*Practice Under the California Environmental Quality Act* (2d. ed. Cal. CEB 2024 § 20.53 [emphasis added]; *see also Rialto Citizens for Responsible Growth v. City of Rialto* (2012) 208 Cal.App.4th 899, 942; *Save Round Valley Alliance v. County of Inyo* (2007) 157 Cal.App.4th 1473, 1466 n.16.) Appendix G of the Guidelines requires agencies to consider whether a project may "[h]ave a substantial adverse effect . . . on any species identified as . . . ***special status*** [] in local or regional plans, policies, or regulations, or by the

California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service." (CEQA Guidelines, App. G § (IV)(a) [emphasis added].) This is broader than the requirement to analyze potential impacts to ***rare*** species (*Id.* at § (XXI)(a)), which carries a definition that is distinct from "special status species." (*See* CEQA Guidelines § 15380(b)(2).)

Based on Dr. Smallwood's review of a wildlife database and the site visit, 145 special-status species are known to occur near enough to the Project site to warrant analysis of occurrence potential. Of these species, 3 were recorded on or just off the Project site, 40 have been documented within 1.5 miles of the site, 29 have been documented between 1.5 and 4 miles, and 64 have been documented within 4 to 30 miles of the site. (Smallwood, at 20). The EIR only analyzes the likelihood of 25 of these 145 species. Furthermore, the three special-status species observed by Ms. Smallwood were all among those not analyzed in the EIR.

Dr. Smallwood agreed with CDFW's comments that inadequate effort was made to detect the San Diego pocket mouse and Dulzura pocket mouse, and that either or both species could occur on the Project site. The EIR's desktop review assigns only low likelihoods of occurrence, and the reasoning in support of the assignments is speculative. This speculative reasoning also applies to the analysis of other species assessed for occurrence likelihoods. Given that Dr. Smallwood has provided substantial evidence of potential significant adverse impacts on special-status species, the EIR should be revised to further analyze and mitigate these impacts.

2. The EIR Does Not Adequately Analyze Significant Impacts Resulting From Habitat Loss

Dr. Smallwood concludes that the Project will have significant adverse impacts to wildlife due to direct habitat loss. (Smallwood at 30). The EIR does not attempt to estimate the numerical or productive capacities of the site for nesting birds. Dr. Smallwood calculates that the Project will result in the loss of 4 nest sites, 5.6 nest attempts, and 16.2 fledglings per year, which "would qualify as significant impacts that have not been analyzed in the EIR. (Smallwood, at 30). He further calculates that the Project will result in the loss of 18.2 birds per year. (Id.). The loss of 18.2 birds per year represents a considerable reduction in the current productive capacity of the Project site. Additionally, most of these birds are protected by the federal Migratory Bird Treaty Act and California Migratory Bird Protection Act, which protects migratory birds. Therefore, the EIR should be revised to analyze the Project's impacts to birds from the lost productive capacity from habitat loss.

3. The EIR Does Not Adequately Analyze and Mitigate the Project's Interference With Wildlife Movement

The EIR does not provide serious analysis of the potential for the Project to interfere with wildlife movement. The EIR argues that because it is surrounded by development and it

is fenced, wildlife cannot move across it. (DEIR, at 3.3-8). Dr. Smallwood points out that this argument is flawed because the species detected on the site could not have arrived there without having navigated the developed landscape and fence. (Smallwood, at 30). There has not been a program of observation to characterize how wildlife uses the site for movement in the region. Given the lack of analysis, as well as the clear wildlife movement that has occurred on the Project site, the EIR should be revised to appropriately analyze and mitigate the Project's potential impacts to wildlife movement.

4. The EIR Does Not Adequately Analyze the Potential Impacts of Bird-Window Collision Mortality

The EIR does not analyze or mitigate the potential impacts of bird-window collision mortality. Dr. Smallwood provides an analysis of the effect of glass windows on the aerosphere, a portion of the atmosphere which serves as an essential portion of birds' habitat. (Smallwood, at 31). There are 90 special-status species of birds with potential to use the Project site's aerosphere. (Id.). Based on DEIR's renderings of the Project's proposed buildings, Dr. Smallwood predicts 69 annual bird deaths from window collisions. (Smallwood, at 33). Furthermore, the majority of these predicted deaths would be of birds protected under the Migratory Bird Treaty Act and under the California Migratory Bird Protection Act, thus resulting in significant unmitigated impacts. The Project would result in the taking of rare and sensitive species of birds, as well as transforming the building's airspace into a lethal collision trap to birds. Therefore, the EIR should be revised to appropriately analyze and mitigate the potential impacts oof bird-window collision mortality.

5. The EIR Fails To Analyze Potential Traffic Impacts to Wildlife

The EIR does not address the Project's potential wildlife mortality and injuries caused by project-generated traffic. Vehicle collisions account for the deaths of thousands of wildlife species, and the impacts have often been found to be significant at the population level. (Smallwood, at 34).

The DEIR does not report a prediction of annual VMT that would be generated by the Project. However, it does predict an operational VMT of 2,390,312. (DEIR, at 3.11-11-12) Based on the nearest wildlife traffic collision studies, as well as the highly urbanized area around the Project site, Dr. Smallwood estimates that the predicted annual VMT would result in 508 wildlife fatalities per year due to project-generated traffic. (Smallwood, at 36). These potential wildlife fatalities represent a potential significant impact which is not analyzed or mitigated in the EIR. Therefore, the EIR should be revised to appropriately analyze the impact of wildlife collision mortality resulting from project-generated traffic.

6. The EIR's Cumulative Impacts Analysis is Fundamentally Flawed

According to the EIR, the mitigation for the Project's direct impacts precludes the need for mitigation for potential cumulative impacts. (DEIR, at 2-17). The DEIR claims that a given impact is cumulatively considerable only when it is a significant project-level direct impact that has not been fully mitigated, hence leaving no residual impact. The DEIR implies that cumulative impacts are residual impacts left over by inadequate mitigation of Project impacts. Under CEQA, cumulative impacts "refer to two or more individual effects which, when considered together, are considerable of which compound or increase other environmental impacts." (Cal. Code Regs. Tit. 14, § 15355). The individual effects may be changes from single or multiple projects, and the cumulative impact from several projects is the "change in environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probably future projects. Cumulative impacts can result from individual minor but collectively significant projects taking place over a period of years." (§ 15355 (a-b)).

The EIR's cumulative impacts analysis does not comply with CEQA. Dr. Smallwood measured the cumulative impacts of wildlife habitat loss caused by mitigated development project by revising 80 sites of proposed projects that he had original surveyed in support of comments on CEQA review documents. His study found that mitigated development resulted in a 66% loss of species on site, and 48% loss of species in the Project area. He also observed that cumulative effects of projects on wildlife in neighboring areas resulted in significant decreases in species richness and overall abundance. (Smallwood, at 37). The Project would result in identical declines in wildlife abundance and species richness which would represent significant unmitigated cumulative impacts. Therefore, the EIR should be revised to engage in adequate cumulative impacts analysis.

7. The EIR's Mitigation Strategy is Flawed and Based on Inaccurate Characterization of the Environmental Setting

As discussed above, the EIR's characterization of the Project's environmental setting is lacking. To develop an appropriate mitigation strategy, the EIR should be revised in order to be sufficiently accurate to characterize the existing environmental setting. However, even absent an accurate characterization of the environmental setting, the existing mitigation strategy is inadequate.

Mitigation Measure MM-BIO-1a states that "removal of coastal sage scrub from the Project impact footprint shall only occur from September 1 through February 14 to avoid the bird breeding season. Further, to the maximum extent practicable, grading activities associated with construction of the Project shall occur September 1 through February 14 to avoid the breeding season. If Project construction must occur during the breeding season, MM-BIO-1b shall be implemented." (DEIR, at 3.3-18). However, Dr. Smallwood points out that this measure is not actually a requirement, but rather a condition for implementing MM-BIO-1b.

Mitigation measure MM-BIO-1b requires that:

> Take of birds protected under the Migratory Bird Treaty Act and California Fish and Game Code shall be avoided during the nesting season. To avoid any direct impacts on raptors and/or any migratory birds protected under the Migratory Bird Treaty Act and California Fish and Game Code, removal of habitat that supports active nests on the proposed area of disturbance shall occur outside of the nesting season for these species (February 15 through August 31, annually). If construction occurs during the nesting season, pre-construction nesting bird surveys must be conducted within 72 hours of construction-related activities. If nesting birds are detected by the biologist, the following buffers shall be established: (1) no work within 300 feet of a non-listed nesting migratory bird nest, and (2) no work within 500 feet of a listed bird or raptor nest. However, the biologist may reduce these buffer widths depending on site-specific conditions (e.g., the width and type of screening vegetation between the nest and proposed activity) or the existing ambient level of activity (e.g., existing level of human activity within the buffer distance) in conjunction with consultation with the City of San Marcos. If construction must take place within the recommended buffer widths above, the Project applicant shall contact the City of San Marcos and wildlife agencies to determine the appropriate buffer. (DEIR, at 3.3-18-19).

Dr. Smallwood concurs with the need for preconstruction surveys. However, the measure as written for birds poses shortfalls which would render it largely ineffective. First, the avian breeding season recognized by the CDFW is February 1 through September 15, as opposed to the February 15 through August 31 season listed in MM-BIO-1b. Second, a preconstruction survey by a single biologist within 72 hours of the start of construction would not realistically detect all the nest sites on the Project site. Preconstruction take-avoidance surveys consist of two difficult steps: (1) the biologist performing the survey must identify breeding birds, and (2) the biologist must locate the breeding birds' nest. The first step is normally completed by observing bird behaviors, such as food deliveries and nest territory defense, which typically require many survey on many dates spread through the breeding season for even a single species. (Smallwood, at 38). To effectively identify the breeding birds and their nests, the survey needs to be expanded beyond a single survey, conducted by a single biologist, only 3 days before breaking ground on construction.

Even assuming all the nests can be located, the mitigation measure would only apply to the breeding season of the survey. After the survey year, California would still be denied the production of birds from the Project site every subsequent year, resulting in a permanent and significant impact to the productive capacity of breeding birds. Finally, the mitigation language allows a single individual to make a subjective decision to determine the buffer area for any given species. This mitigation lacks objective or established criteria for the survey and is not enforceable. (Smallwood, at 38).

Mitigation measure MM-BIO-2a requires that:

> The Project applicant shall ensure that the following conditions are implemented during Project construction to minimize potential environmental impacts due to project implementation:
>
> 1. Impacts from fugitive dust shall be avoided and minimized through watering and other appropriate measures consistent with the Construction General Permit Order 2009-009-DWQ.
> 2. Employees shall strictly limit their activities, vehicles, equipment, and construction materials to the Project site.
> 3. To avoid attracting predators, the Project site shall be kept clean of debris. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site.
> 4. Pets of Project personnel shall not be allowed on the Project site. (DEIR, at 3.3-19).

Here, BMPs 1 and 2 would be implemented for reasons outside of minimizing harm to wildlife. Furthermore, BMPs 3 and 4 would bring only trivial benefits to wildlife relative to the impacts. Overall, the BMPs would achieve little, if any, benefit to conservation efforts. (Smallwood, at 39).

Mitigation measure MM-BIO-2b implements requirements regarding development landscaping. (DEIR, at 3.3-19). Unfortunately, Dr. Smallwood states that this measure is empty of meaningful conservation benefits. Because the Project would not be located adjacent to wildlife habitat, invasive plant species that might expand into natural vegetation cover is not an issue. (Smallwood, at 39).

Mitigation measure MM-BIO-2c contains requirements for maintenance of a biological monitor on the Project site. (DEIR, at 3.3-19-20). Dr. Smallwood suggests an additional requirement that the monitor should report all instances of wildlife mortality and injury resulting from construction activities. He also notes that this measure would do nothing to avoid or minimize the impacts predicted above. (Smallwood, at 40).

Mitigation measure MM-BIO-3 involves off-site mitigation of impacts to sensitive vegetation via purchase of 2.13 acres of Diegan coastal sage scrub and 0.06 acres of non-native grassland from a mitigation bank. (DEIR, at 3.3-20). However, this measure is missing critical details such as whether and where Diegan coastal sage scrub and annual grassland habitat is available for purchase, and to what degree the purchase of annual grassland habitat could be up-tiered to coastal sage scrub. Dr. Smallwood concurs with CDFW's comment that the proposed habitat mitigation ratio is deficient but suggests a higher mitigation ratio for Diegan coastal sage scrub due to the rapid and severe habitat fragmentation of the vegetation community. (Smallwood, at 40).

In addition to modifications to the existing mitigation measures, Dr. Smallwood also suggests the following mitigation measures be implemented for the Project:

- **Road Mortality:** Compensatory mitigation is needed for the increased wildlife mortality that would be caused by bird-window collisions and the project-generated road traffic in the region. I suggest that this mitigation can be directed toward funding research to identify fatality patterns and effective impact reduction measures such as reduced speed limits and wildlife under-crossings or overcrossings of particularly dangerous road segments. Compensatory mitigation can also be provided in the form of donations to wildlife rehabilitation facilities (see below).
- **Fund Wildlife Rehabilitation Facilities:** Compensatory mitigation ought also to include funding contributions to wildlife rehabilitation facilities to cover the costs of injured animals that will be delivered to these facilities for care. Many animals would likely be injured by collisions with the building's windows and with automobiles traveling to and from the building.
- **Landscaping:** If the Project goes forward, California native plant landscaping (i.e., grassland and locally appropriate scrub plants) should be considered to be used as opposed to landscaping with lawn and exotic shrubs and trees. Native plants offer more structure, cover, food resources, and nesting substrate for wildlife than landscaping with lawn and ornamental trees. Native plant landscaping has been shown to increase the abundance of arthropods which act as importance sources of food for wildlife and are crucial for pollination and plant reproduction (Narango et al. 2017, Adams et al. 2020, Smallwood and Wood 2022.). Further, many endangered and threated insects require native host plants for reproduction and migration, e.g., monarch butterfly. Around the world, landscaping with native plants over exotic plants increases the abundance and diversity of birds, and is particularly valuable to native birds (Lerman and Warren 2011, Burghardt et al. 2008, Berthon et al. 2021, Smallwood and Wood 2022). Landscaping with native plants is a way to maintain or to bring back some of the natural habitat and lessen the footprint of urbanization by acting as interconnected patches of habitat for wildlife (Goddard et al. 2009, Tallamy 2020). Lastly, not only does native plant landscaping benefit wildlife, it requires less water and maintenance than traditional landscaping with lawn and hedges. (Smallwood, at 41).

The current mitigation measures present in the EIR are insufficient to address the Project's potentially significant impacts to wildlife. As a result, the EIR should be revised to incorporate Dr. Smallwood's comments and suggestions regarding the mitigation plan.

8. The FEIR Fails to Adequately Respond to Comments from California Department of Fish and Wildlife.

"Where comments from responsible experts or sister agencies disclose new or

conflicting data or opinions that cause concern that the agency may not have fully evaluated the project and its alternatives, these comments may not simply be ignored. There must be good faith, reasoned analysis in response." Berkeley Keep Jets Over the Bay Com. v. Board of Port Cmrs., (2001) 91 Cal.App.4th 1344, 1367 ("Berkeley Jets") (EIR inadequate due to failure to respond to expert evidence on toxic air contaminants). An agency's responses to comments must specifically explain the reasons for rejecting suggestions received in comments and for proceeding with a project despite its environmental impacts. Such explanations must be supported with specific references to empirical information, scientific authority, and/or explanatory information. (Cleary v. County of Stanislaus (1981) 118 Cal.App.3d 348, 357.) The responses, moreover, must manifest a good faith, reasoned analysis; conclusory statements unsupported by factual information will not suffice. (People v. County of Kern (1974) 39 Cal.App.3d 830, 841.) The need for a reasoned, factual response is particularly acute when critical comments are submitted by other agencies or by experts. (See Berkeley Keep Jets Over the Bay Comm. v Board of Port Comm'rs (2001) 91 CA4th 1344, 1367, 1371; People v County of Kern (1976) 62 CA3d 761, 772.)

Here, the City responded in a cursory and inadequate way to the expert comments of the California Department of Fish and Wildlife ("CDFW") relating to the inadequacy of the EIR's analysis and mitigation of impacts to biological resources.

CDFW provided comments on the DEIR indicating that the Project may impact Crotch's bumble bee, a candidate species for listing under the California Endangered Species Act, yet the EIR includes no discussion of Crotch's bumble bee and does not propose any mitigation to reduce impacts. CDFW also commented that the Project may impact multiple pocket mouse species. In response to CDFW's comments, the City did not update the EIR to analyze these potentially significant impacts. Instead, the FEIR dismisses the potential for impacts by asserting, without evidentiary support, that Crotch's bumble bee and two pocket mouse species have a low potential to occur on site. The FEIR's response to CDFW's comment is nothing more than conclusory statements, unsupported by any expert opinion or other substantial evidence in violation of CEQA.

CDFW also commented that the EIR's proposed mitigation ratios of 1:1 for Diegen coastal sage scrub and 0.5:1 for non-native grassland, which are consistent with the City's draft SAP, may not be sufficient to reduce Project impacts. (FEIR, 0.3-8.) CDFW explained that the Draft SAP included development of a City-wide preserve system to meet MHCP biological conservation goals, but the SAP was never adopted and the preserve system is not in place. Without a City-wide preserve system, CDFW concludes that high mitigation ratios are needed, suggesting at least 2:1 for Diegan coastal sage scrub impacts and 1:1 for non-native grasslands. (Id.)

The FEIR does not meaningfully respond to this comment either. Instead, it dismisses the need for greater mitigation for two reasons, neither of which are acceptable. First, it dismisses the need for a higher mitigation ratio because "[t]here are no other additional

mitigation ratios applicable to the project for these species." (FEIR 0.3-19.) This explanation makes no sense. The applicable mitigation ratio is whatever ratio is needed to mitigate a particular impact. Moreover, here, CDFW has told the City that the applicable mitigation ratio should be at least 2:1 for Diegan coastal sage scrub impacts and 1:1 for non-native grasslands.

Second, the FEIR claims that no higher mitigation ratio is needed because "[c]compliance with regulations is a common and reasonable mitigation measure" and "[t]herefore, ratios in compliance with the City's SAP is sufficient mitigation." (FEIR 0.3-19.) It is true that compliance with regulations can be a reasonable mitigation measure – but only if compliance with a regulation actually mitigates the significant impact. The fact that a Project complies with a regulation does not mean an impact is not significant. (Kings Co v. Hanford (1990)221 CA3d 692, 712-718.) Moreover, here, the mitigation ratio adopted is not complying with a regulation because the City's SAP was never adopted.

In addition, CDFW commented that the cumulative analysis of impacts on biological resources is incomplete because it does not include the development immediately adjacent to the Project site or the Palomar Station Specific Plan, both of which CDFW concludes will have cumulative impacts on species together with the Project.

The FEIR response dismisses the need to include these projects because it claims there would be no "related impacts." (FEIR, p. 0.3-19.) But the FEIR response admits that the Palomar Station EIR found the project would result in impacts to Diegan coastal sage scrub and could impact sensitive species including Migratory Bird Treaty Act protected species. (FEIR, p. 0.3-19.) The Project will also impact Diegan coastal sage scrub and migratory birds. CDFW's comment should have been substantively addressed in an updated analysis and not merely dismissed.

The FEIR's response to CDFW's comments are conclusory, not supported by evidence, and do not demonstrate a good faith effort to grapple with the concerns raised by CDFW.

9. Impacts to Crotch's Bumble Bee Require Recirculation of the EIR.

CDFW's comments disclose a new significant impact requiring revisions and recirculation of the EIR to address impacts to Crotch's bumble bee. The response to comments acknowledges that the EIR was "updated to acknowledge that an Incidental Take Permit could be required if take of Critch's bumble bee cannot feasibly be avoided." (FEIR, p. 0.3-18.) However, this minor updated falls far short of the thorough analysis and disclosure of the Project's potential impact on Crotch's bumble bees required by CEQA ,particularly in light of the expert comments submitted by CDFW. Without substantial evidence to the contrary, the EIR must be revised and recirculated to analyze and disclose

this potentially significant impact on a protected species. (14 CCR 15088.5(a).)

Dr. Smallwood notes that the FEIR's requirement for a Crotch's bumble bee preconstruction survey mischaracterizes what should be a detection, or focused survey. Detection surveys are performed for the purpose of disclosing information to the public and decision makers. Dr. Smallwood disagrees with CDFW's characterization of this type of survey as a mitigation measure, as the measure bypasses timely, meaningful disclose regarding the existence of Crotch's bumble bee. (Smallwood, at 42).

The FEIR says that "[d]espite the low potential for occurrence, to ensure that the project does not result in take of Crotch's bumble bee, mitigation measure MM-NIO-6 has been updated to include pre-construction surveys that shall be conducted…" (FEIR, p. 0.3-17.) It also states that "[a]lthough the potential for the species to occur on site is low, the Biological Resources Report has been updated to include measures to minimize and/or mitigate potential impacts to Crotch's bumble bee." Simply adopting mitigation measures without first conducting a thorough analysis of the potential impacts does not remedy the EIR's failure to analyze the Project's impact on Crotch's bumble bee in the EIR as required by CEQA. The EIR must be revised and recirculated to address this new significant impact.

Conclusion

SAFER requests that the Planning Commission refrain from recommending the certification of the FEIR in order to allow staff additional time to address the concerns raised herein. Please include this letter in the record of proceedings for this project. Thank you for your attention to these comments.

Sincerely,

Mitchell E. Thielemann

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EXHIBIT A

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From: Francis J. Offermann PE CIH

Subject: Indoor Air Quality: Armorlite Lofts Project–San Marcos, CA
(IEE File Reference: P-4871)

Pages: 18

Indoor Air Quality Impacts

Indoor air quality (IAQ) directly impacts the comfort and health of building occupants, and the achievement of acceptable IAQ in newly constructed and renovated buildings is a well-recognized design objective. For example, IAQ is addressed by major high-performance building rating systems and building codes (California Building Standards Commission, 2014; USGBC, 2014). Indoor air quality in homes is particularly important because occupants, on average, spend approximately ninety percent of their time indoors with the majority of this time spent at home (EPA, 2011). Some segments of the population that are most susceptible to the effects of poor IAQ, such as the very young and the elderly, occupy their homes almost continuously. Additionally, an increasing number of adults are working from home at least some of the time during the workweek. Indoor air quality also is a serious concern for workers in hotels, offices and other business establishments.

The concentrations of many air pollutants often are elevated in homes and other buildings relative to outdoor air because many of the materials and products used indoors contain and release a variety of pollutants to air (Hodgson et al., 2002; Offermann and Hodgson,

2011). With respect to indoor air contaminants for which inhalation is the primary route of exposure, the critical design and construction parameters are the provision of adequate ventilation and the reduction of indoor sources of the contaminants.

Indoor Formaldehyde Concentrations Impact. In the California New Home Study (CNHS) of 108 new homes in California (Offermann, 2009), 25 air contaminants were measured, and formaldehyde was identified as the indoor air contaminant with the highest cancer risk as determined by the California Proposition 65 Safe Harbor Levels (OEHHA, 2017a), No Significant Risk Levels (NSRL) for carcinogens. The NSRL is the daily intake level calculated to result in one excess case of cancer in an exposed population of 100,000 (i.e., ten in one million cancer risk) and for formaldehyde is 40 µg/day. The NSRL concentration of formaldehyde that represents a daily dose of 40 µg is 2 µg/m^3, assuming a continuous 24-hour exposure, a total daily inhaled air volume of 20 m^3, and 100% absorption by the respiratory system. All of the CNHS homes exceeded this NSRL concentration of 2 µg/m^3. The median indoor formaldehyde concentration was 36 µg/m^3, and ranged from 4.8 to 136 µg/m^3, which corresponds to a median exceedance of the 2 µg/m^3 NSRL concentration of 18 and a range of 2.3 to 68.

Therefore, the cancer risk of a resident living in a California home with the median indoor formaldehyde concentration of 36 µg/m^3, is 180 per million as a result of formaldehyde alone. The CEQA significance threshold for airborne cancer risk is 10 per million, as established by the San Diego County Air Pollution Control District (SDAPCD, 2021).

Besides being a human carcinogen, formaldehyde is also a potent eye and respiratory irritant. In the CNHS, many homes exceeded the non-cancer reference exposure levels (RELs) prescribed by California Office of Environmental Health Hazard Assessment (OEHHA, 2017b). The percentage of homes exceeding the RELs ranged from 98% for the Chronic REL of 9 µg/m^3 to 28% for the Acute REL of 55 µg/m^3.

The primary source of formaldehyde indoors is composite wood products manufactured with urea-formaldehyde resins, such as plywood, medium density fiberboard, and

particleboard. These materials are commonly used in building construction for flooring, cabinetry, baseboards, window shades, interior doors, and window and door trims.

In January 2009, the California Air Resources Board (CARB) adopted an airborne toxics control measure (ATCM) to reduce formaldehyde emissions from composite wood products, including hardwood plywood, particleboard, medium density fiberboard, and also furniture and other finished products made with these wood products (California Air Resources Board 2009). While this formaldehyde ATCM has resulted in reduced emissions from composite wood products sold in California, they do not preclude that homes built with composite wood products meeting the CARB ATCM will have indoor formaldehyde concentrations below cancer and non-cancer exposure guidelines.

A follow up study to the California New Home Study (CNHS) was conducted in 2016-2018 (Singer et. al., 2019), and found that the median indoor formaldehyde in new homes built after 2009 with CARB Phase 2 Formaldehyde ATCM materials had lower indoor formaldehyde concentrations, with a median indoor concentrations of 22.4 $\mu g/m^3$ (18.2 ppb) as compared to a median of 36 $\mu g/m^3$ found in the 2007 CNHS. Unlike in the CNHS study where formaldehyde concentrations were measured with pumped DNPH samplers, the formaldehyde concentrations in the HENGH study were measured with passive samplers, which were estimated to under-measure the true indoor formaldehyde concentrations by approximately 7.5%. Applying this correction to the HENGH indoor formaldehyde concentrations results in a median indoor concentration of 24.1 $\mu g/m^3$, which is 33% lower than the 36 $\mu g/m^3$ found in the 2007 CNHS.

Thus, while new homes built after the 2009 CARB formaldehyde ATCM have a 33% lower median indoor formaldehyde concentration and cancer risk, the median lifetime cancer risk is still 120 per million for homes built with CARB compliant composite wood products. This median lifetime cancer risk is more than 12 times the OEHHA 10 in a million cancer risk threshold (OEHHA, 2017a).

According to the Final Environmental Impact Report – Armorlite Lofts Specific Plan, San Marcos, CA (SMA, 2025) the Project consists of residential spaces.

The residential occupants will potentially have continuous exposure (e.g. 24 hours per day, 52 weeks per year). These exposures are anticipated to result in significant cancer risks resulting from exposures to formaldehyde released by the building materials and furnishing commonly found in residential construction.

Because these residences will be constructed with CARB Phase 2 Formaldehyde ATCM materials, and be ventilated with the minimum code required amount of outdoor air, the indoor residential formaldehyde concentrations are likely similar to those concentrations observed in residences built with CARB Phase 2 Formaldehyde ATCM materials, which is a median of 24.1 $\mu g/m^3$ (Singer et. al., 2020)

Assuming that the residential occupants inhale 20 m^3 of air per day, the average 70-year lifetime formaldehyde daily dose is 482 µg/day for continuous exposure in the residences. This exposure represents a cancer risk of 120 per million, which is more than 12 times the CEQA cancer risk of 10 per million. For occupants that do not have continuous exposure for 70 years, the cancer risk will be proportionally less but still substantially over the CEQA cancer risk of 10 per million (e.g. continuous 20 year occupancy, more than 3.4 times the CEQA cancer risk of 10 per million).

In addition, we note that the average outdoor air concentration of formaldehyde in California is 3 ppb, or 3.7 $\mu g/m^3$, (California Air Resources Board, 2004), and thus represents an average pre-existing background airborne cancer risk of 1.85 per million. Thus, the indoor air formaldehyde exposures describe above exacerbate this pre-existing risk resulting from outdoor air formaldehyde exposures.

Appendix A, Indoor Formaldehyde Concentrations and the CARB Formaldehyde ATCM, provides analyses that show utilization of CARB Phase 2 Formaldehyde ATCM materials will not ensure acceptable cancer risks with respect to formaldehyde emissions from composite wood products.

Even composite wood products manufactured with CARB certified ultra low emitting formaldehyde (ULEF) resins do not insure that the indoor air will have concentrations of formaldehyde the meet the OEHHA cancer risks that substantially exceed 10 per million. The permissible emission rates for ULEF composite wood products are only 11-15% lower than the CARB Phase 2 emission rates. Only use of composite wood products made with no-added formaldehyde resins (NAF), such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

The following describes a method that should be used, prior to construction in the environmental review under CEQA, for determining whether the indoor concentrations resulting from the formaldehyde emissions of specific building materials/furnishings selected exceed cancer and non-cancer guidelines. Such a design analyses can be used to identify those materials/furnishings prior to the completion of the City's CEQA review and project approval, that have formaldehyde emission rates that contribute to indoor concentrations that exceed cancer and non-cancer guidelines, so that alternative lower emitting materials/furnishings may be selected and/or higher minimum outdoor air ventilation rates can be increased to achieve acceptable indoor concentrations and incorporated as mitigation measures for this project.

Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment

This formaldehyde emissions assessment should be used in the environmental review under CEQA to assess the indoor formaldehyde concentrations from the proposed loading of building materials/furnishings, the area-specific formaldehyde emission rate data for building materials/furnishings, and the design minimum outdoor air ventilation rates. This assessment allows the applicant (and the City) to determine, before the conclusion of the environmental review process and the building materials/furnishings are specified, purchased, and installed, if the total chemical emissions will exceed cancer and non-cancer guidelines, and if so, allow for changes in the selection of specific material/furnishings and/or the design minimum outdoor air ventilations rates such that cancer and non-cancer guidelines are not exceeded.

1.) Define Indoor Air Quality Zones. Divide the building into separate indoor air quality zones, (IAQ Zones). IAQ Zones are defined as areas of well-mixed air. Thus, each ventilation system with recirculating air is considered a single zone, and each room or group of rooms where air is not recirculated (e.g. 100% outdoor air) is considered a separate zone. For IAQ Zones with the same construction material/furnishings and design minimum outdoor air ventilation rates. (e.g. hotel rooms, apartments, condominiums, etc.) the formaldehyde emission rates need only be assessed for a single IAQ Zone of that type.

2.) Calculate Material/Furnishing Loading. For each IAQ Zone, determine the building material and furnishing loadings (e.g., m^2 of material/m^2 floor area, units of furnishings/m^2 floor area) from an inventory of all potential indoor formaldehyde sources, including flooring, ceiling tiles, furnishings, finishes, insulation, sealants, adhesives, and any products constructed with composite wood products containing urea-formaldehyde resins (e.g., plywood, medium density fiberboard, particleboard).

3.) Calculate the Formaldehyde Emission Rate. For each building material, calculate the formaldehyde emission rate (µg/h) from the product of the area-specific formaldehyde emission rate (µg/m^2-h) and the area (m^2) of material in the IAQ Zone, and from each furnishing (e.g. chairs, desks, etc.) from the unit-specific formaldehyde emission rate (µg/unit-h) and the number of units in the IAQ Zone.

NOTE: As a result of the high-performance building rating systems and building codes (California Building Standards Commission, 2014; USGBC, 2014), most manufacturers of building materials furnishings sold in the United States conduct chemical emission rate tests using the California Department of Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers," (CDPH, 2017), or other equivalent chemical emission rate testing methods. Most manufacturers of building furnishings sold in the United States conduct chemical emission rate tests using ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions (BIFMA, 2018), or other equivalent chemical emission rate testing methods.

CDPH, BIFMA, and other chemical emission rate testing programs, typically certify that a material or furnishing does not create indoor chemical concentrations in excess of the maximum concentrations permitted by their certification. For instance, the CDPH emission rate testing requires that the measured emission rates when input into an office, school, or residential model do not exceed one-half of the OEHHA Chronic Exposure Guidelines (OEHHA, 2017b) for the 35 specific VOCs, including formaldehyde, listed in Table 4-1 of the CDPH test method (CDPH, 2017). These certifications themselves do not provide the actual area-specific formaldehyde emission rate (i.e., $\mu g/m^2$-h) of the product, but rather provide data that the formaldehyde emission rates do not exceed the maximum rate allowed for the certification. Thus, for example, the data for a certification of a specific type of flooring may be used to calculate that the area-specific emission rate of formaldehyde is less than 31 $\mu g/m^2$-h, but not the actual measured specific emission rate, which may be 3, 18, or 30 $\mu g/m^2$-h. These area-specific emission rates determined from the product certifications of CDPH, BIFA, and other certification programs can be used as an initial estimate of the formaldehyde emission rate.

If the actual area-specific emission rates of a building material or furnishing is needed (i.e. the initial emission rates estimates from the product certifications are higher than desired), then that data can be acquired by requesting from the manufacturer the complete chemical emission rate test report. For instance if the complete CDPH emission test report is requested for a CDHP certified product, that report will provide the actual area-specific emission rates for not only the 35 specific VOCs, including formaldehyde, listed in Table 4-1 of the CDPH test method (CDPH, 2017), but also all of the cancer and reproductive/developmental chemicals listed in the California Proposition 65 Safe Harbor Levels (OEHHA, 2017a), all of the toxic air contaminants (TACs) in the California Air Resources Board Toxic Air Contamination List (CARB, 2011), and the 10 chemicals with the greatest emission rates.

Alternatively, a sample of the building material or furnishing can be submitted to a chemical emission rate testing laboratory, such as Berkeley Analytical Laboratory (https://berkeleyanalytical.com), to measure the formaldehyde emission rate.

4.) Calculate the Total Formaldehyde Emission Rate. For each IAQ Zone, calculate the total formaldehyde emission rate (i.e. µg/h) from the individual formaldehyde emission rates from each of the building material/furnishings as determined in Step 3.

5.) Calculate the Indoor Formaldehyde Concentration. For each IAQ Zone, calculate the indoor formaldehyde concentration (µg/m^3) from Equation 1 by dividing the total formaldehyde emission rates (i.e. µg/h) as determined in Step 4, by the design minimum outdoor air ventilation rate (m^3/h) for the IAQ Zone.

$$C_{in} = \frac{E_{total}}{Q_{oa}} \quad \text{(Equation 1)}$$

where:

C_{in} = indoor formaldehyde concentration (µg/m^3)

E_{total} = total formaldehyde emission rate (µg/h) into the IAQ Zone.

Q_{oa} = design minimum outdoor air ventilation rate to the IAQ Zone (m^3/h)

The above Equation 1 is based upon mass balance theory, and is referenced in Section 3.10.2 "Calculation of Estimated Building Concentrations" of the California Department of Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers", (CDPH, 2017).

6.) Calculate the Indoor Exposure Cancer and Non-Cancer Health Risks. For each IAQ Zone, calculate the cancer and non-cancer health risks from the indoor formaldehyde concentrations determined in Step 5 and as described in the OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines; Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015).

7.) Mitigate Indoor Formaldehyde Exposures of exceeding the CEQA Cancer and/or Non-Cancer Health Risks. In each IAQ Zone, provide mitigation for any formaldehyde exposure risk as determined in Step 6, that exceeds the CEQA cancer risk of 10 per million or the CEQA non-cancer Hazard Quotient of 1.0.

Provide the source and/or ventilation mitigation required in all IAQ Zones to reduce the

health risks of the chemical exposures below the CEQA cancer and non-cancer health risks.

Source mitigation for formaldehyde may include:

1.) reducing the amount materials and/or furnishings that emit formaldehyde
2.) substituting a different material with a lower area-specific emission rate of formaldehyde

Ventilation mitigation for formaldehyde emitted from building materials and/or furnishings may include:

1.) increasing the design minimum outdoor air ventilation rate to the IAQ Zone.

NOTE: Mitigating the formaldehyde emissions through use of less material/furnishings, or use of lower emitting materials/furnishings, is the preferred mitigation option, as mitigation with increased outdoor air ventilation increases initial and operating costs associated with the heating/cooling systems.

Further, we are not asking that the builder "speculate" on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers," (CDPH, 2017), and use the procedure described earlier above (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Outdoor Air Ventilation Impact. Another important finding of the CNHS, was that the outdoor air ventilation rates in the homes were very low. Outdoor air ventilation is a very important factor influencing the indoor concentrations of air contaminants, as it is the primary removal mechanism of all indoor air generated contaminants. Lower outdoor air exchange rates cause indoor generated air contaminants to accumulate to higher indoor air concentrations. Many homeowners rarely open their windows or doors for ventilation as a

result of their concerns for security/safety, noise, dust, and odor concerns (Price, 2007). In the CNHS field study, 32% of the homes did not use their windows during the 24-hour Test Day, and 15% of the homes did not use their windows during the entire preceding week. Most of the homes with no window usage were homes in the winter field session. Thus, a substantial percentage of homeowners never open their windows, especially in the winter season. The median 24-hour measurement was 0.26 air changes per hour (ach), with a range of 0.09 ach to 5.3 ach. A total of 67% of the homes had outdoor air exchange rates below the minimum California Building Code (2001) requirement of 0.35 ach. Thus, the relatively tight envelope construction, combined with the fact that many people never open their windows for ventilation, results in homes with low outdoor air exchange rates and higher indoor air contaminant concentrations.

According to the Final Environmental Impact Report – Armorlite Lofts Specific Plan, San Marcos, CA (SMA, 2025), the Project is located close to roads with moderate to high traffic including; I-78, North Las Pasa Road, West Mission Road, as well as the San Diego Northern Railroad. Table 3.8-14 reports that the future ambient noise levels will range from 59.6 to 65.4 with balcony modifications.

Thus, the Project is located in a sound impacted area. However, the ambient sound levels were only measured for a single 24-hour period. In order to design the building for this Project such that interior noise levels are acceptable, an acoustic study with actual on-site measurements of the existing ambient noise levels and modeled future ambient noise levels needs to be conducted. The acoustic study of the existing ambient noise levels should be conducted over a minimum of a one-week period and report the dBA CNEL or Ldn. This study will allow for the selection of a building envelope and windows with a sufficient STC such that the indoor noise levels are acceptable. A mechanical supply of outdoor air ventilation to allow for a habitable interior environment with closed windows and doors will also be required. Such a ventilation system would allow windows and doors to be kept closed at the occupant's discretion to control exterior noise within building interiors.

$PM_{2.5}$ Outdoor Concentrations Impact. An additional impact of the nearby motor vehicle traffic associated with this project, are the outdoor concentrations of $PM_{2.5}$. According to

the Final Environmental Impact Report – Armorlite Lofts Specific Plan, San Marcos, CA (SMA, 2025), the Project is located in the San Diego Air Basin, which is a State and Federal non-attainment area for $PM_{2.5}$.

An air quality analyses needs to be conducted to determine the concentrations of $PM_{2.5}$ in the outdoor and indoor air that people inhale each day. This air quality analyses needs to consider the cumulative impacts of the project related emissions, existing and projected future emissions from local $PM_{2.5}$ sources (e.g. stationary sources, motor vehicles, and airport traffic) upon the outdoor air concentrations at the Project site. If the outdoor concentrations are determined to exceed the California and National annual average $PM_{2.5}$ exceedence concentration of 12 $\mu g/m^3$, or the National 24-hour average exceedence concentration of 35 $\mu g/m^3$, then the buildings need to have a mechanical supply of outdoor air that has air filtration with sufficient removal efficiency, such that the indoor concentrations of outdoor $PM_{2.5}$ particles is less than the California and National $PM_{2.5}$ annual and 24-hour standards.

It is my experience that based on the projected high traffic noise levels, the annual average concentration of $PM_{2.5}$ will exceed the California and National $PM_{2.5}$ annual and 24-hour standards and warrant installation of high efficiency air filters (i.e. MERV 13 or higher) in all mechanically supplied outdoor air ventilation systems.

Indoor Air Quality Impact Mitigation Measures

The following are recommended mitigation measures to minimize the impacts upon indoor quality:

Indoor Formaldehyde Concentrations Mitigation. Use only composite wood materials (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins (CARB, 2009). CARB Phase 2 certified composite wood products, or ultra-low emitting formaldehyde (ULEF) resins, do not insure indoor formaldehyde concentrations that are below the CEQA cancer risk of 10 per million. Only composite wood products

manufactured with CARB approved no-added formaldehyde (NAF) resins, such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met (see Appendix A).

Alternatively, conduct the previously described Pre-Construction Building Material/Furnishing Chemical Emissions Assessment, to determine that the combination of formaldehyde emissions from building materials and furnishings do not create indoor formaldehyde concentrations that exceed the CEQA cancer and non-cancer health risks.

It is important to note that we are not asking that the builder "speculate" on what and how much composite materials be used, but rather at the design stage to select composite wood materials based on the formaldehyde emission rates that manufacturers routinely conduct using the California Department of Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers", (CDPH, 2017), and use the procedure described above (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Outdoor Air Ventilation Mitigation. Provide each habitable room with a continuous mechanical supply of outdoor air that meets or exceeds the California 2016 Building Energy Efficiency Standards (California Energy Commission, 2015) requirements of the greater of 15 cfm/occupant or 0.15 cfm/ft^2 of floor area. Following installation of the system conduct testing and balancing to insure that required amount of outdoor air is entering each habitable room and provide a written report documenting the outdoor airflow rates. Do not use exhaust only mechanical outdoor air systems, use only balanced outdoor air supply and exhaust systems or outdoor air supply only systems. Provide a manual for the occupants or maintenance personnel, that describes the purpose of the mechanical outdoor air system and the operation and maintenance requirements of the system.

$PM_{2.5}$ Outdoor Air Concentration Mitigation. Install air filtration with sufficient $PM_{2.5}$ removal efficiency (e.g. MERV 13 or higher) to filter the outdoor air entering the

mechanical outdoor air supply systems, such that the indoor concentrations of outdoor $PM_{2.5}$ particles are less than the California and National $PM_{2.5}$ annual and 24-hour standards. Install the air filters in the system such that they are accessible for replacement by the occupants or maintenance personnel. Include in the mechanical outdoor air ventilation system manual instructions on how to replace the air filters and the estimated frequency of replacement.

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APPENDIX A

INDOOR FORMALDEHYDE CONCENTRATIONS
AND THE
CARB FORMALDEHYDE ATCM

With respect to formaldehyde emissions from composite wood products, the CARB ATCM regulations of formaldehyde emissions from composite wood products, do not assure healthful indoor air quality. The following is the stated purpose of the CARB ATCM regulation - *The purpose of this airborne toxic control measure is to "reduce formaldehyde emissions from composite wood products, and finished goods that contain composite wood products, that are sold, offered for sale, supplied, used, or manufactured for sale in California".* In other words, the CARB ATCM regulations do not "assure healthful indoor air quality", but rather "reduce formaldehyde emissions from composite wood products".

Just how much protection do the CARB ATCM regulations provide building occupants from the formaldehyde emissions generated by composite wood products? Definitely some, but certainly the regulations do not "*assure healthful indoor air quality"* when CARB Phase 2 products are utilized. As shown in the Chan 2019 study of new California homes, the median indoor formaldehyde concentration was of 22.4 $\mu g/m^3$ (18.2 ppb), which corresponds to a cancer risk of 112 per million for occupants with continuous exposure, which is more than 11 times the CEQA cancer risk of 10 per million.

Another way of looking at how much protection the CARB ATCM regulations provide building occupants from the formaldehyde emissions generated by composite wood products is to calculate the maximum number of square feet of composite wood product that can be in a residence without exceeding the CEQA cancer risk of 10 per million for occupants with continuous occupancy.

For this calculation I utilized the floor area (2,272 ft^2), the ceiling height (8.5 ft), and the number of bedrooms (4) as defined in Appendix B (New Single-Family Residence Scenario) of the Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions for Indoor Sources Using Environmental Chambers, Version 1.1, 2017, California Department of Public Health,

Richmond, CA. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/VOC.aspx.

For the outdoor air ventilation rate I used the 2019 Title 24 code required mechanical ventilation rate (ASHRAE 62.2) of 106 cfm (180 m^3/h) calculated for this model residence. For the composite wood formaldehyde emission rates I used the CARB ATCM Phase 2 rates.

The calculated maximum number of square feet of composite wood product that can be in a residence, without exceeding the CEQA cancer risk of 10 per million for occupants with continuous occupancy are as follows for the different types of regulated composite wood products.

Medium Density Fiberboard (MDF) – 15 ft^2 (0.7% of the floor area), or
Particle Board – 30 ft^2 (1.3% of the floor area), or
Hardwood Plywood – 54 ft^2 (2.4% of the floor area), or
Thin MDF – 46 ft^2 (2.0 % of the floor area).

For offices and hotels the calculated maximum amount of composite wood product (% of floor area) that can be used without exceeding the CEQA cancer risk of 10 per million for occupants, assuming 8 hours/day occupancy, and the California Mechanical Code minimum outdoor air ventilation rates are as follows for the different types of regulated composite wood products.

Medium Density Fiberboard (MDF) – 3.6 % (offices) and 4.6% (hotel rooms), or
Particle Board – 7.2 % (offices) and 9.4% (hotel rooms), or
Hardwood Plywood – 13 % (offices) and 17% (hotel rooms), or
Thin MDF – 11 % (offices) and 14 % (hotel rooms)

Clearly the CARB ATCM does not regulate the formaldehyde emissions from composite wood products such that the potentially large areas of these products, such as for flooring, baseboards, interior doors, window and door trims, and kitchen and bathroom cabinetry, could be used without causing indoor formaldehyde concentrations that result in CEQA

cancer risks that substantially exceed 10 per million for occupants with continuous occupancy.

Even composite wood products manufactured with CARB certified ultra low emitting formaldehyde (ULEF) resins do not insure that the indoor air will have concentrations of formaldehyde the meet the OEHHA cancer risks that substantially exceed 10 per million. The permissible emission rates for ULEF composite wood products are only 11-15% lower than the CARB Phase 2 emission rates. Only use of composite wood products made with no-added formaldehyde resins (NAF), such as resins made from soy, polyvinyl acetate, or methylene diisocyanate can insure that the OEHHA cancer risk of 10 per million is met.

If CARB Phase 2 compliant or ULEF composite wood products are utilized in construction, then the resulting indoor formaldehyde concentrations should be determined in the design phase using the specific amounts of each type of composite wood product, the specific formaldehyde emission rates, and the volume and outdoor air ventilation rates of the indoor spaces, and all feasible mitigation measures employed to reduce this impact (e.g. use less formaldehyde containing composite wood products and/or incorporate mechanical systems capable of higher outdoor air ventilation rates). See the procedure described earlier (i.e. Pre-Construction Building Material/Furnishing Formaldehyde Emissions Assessment) to insure that the materials selected achieve acceptable cancer risks from material off gassing of formaldehyde.

Alternatively, and perhaps a simpler approach, is to use only composite wood products (e.g. hardwood plywood, medium density fiberboard, particleboard) for all interior finish systems that are made with CARB approved no-added formaldehyde (NAF) resins.

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Education

M.S. Mechanical Engineering (1985)
Stanford University, Stanford, CA.

Graduate Studies in Air Pollution Monitoring and Control (1980)
University of California, Berkeley, CA.

B.S. in Mechanical Engineering (1976)
Rensselaer Polytechnic Institute, Troy, N.Y.

Professional Experience

President: Indoor Environmental Engineering, San Francisco, CA. December, 1981 - present.

Direct team of environmental scientists, chemists, and mechanical engineers in conducting State and Federal research regarding indoor air quality instrumentation development, building air quality field studies, ventilation and air cleaning performance measurements, and chemical emission rate testing.

Provide design side input to architects regarding selection of building materials and ventilation system components to ensure a high quality indoor environment.

Direct Indoor Air Quality Consulting Team for the winning design proposal for the new State of Washington Ecology Department building.

Develop a full-scale ventilation test facility for measuring the performance of air diffusers; ASHRAE 129, Air Change Effectiveness, and ASHRAE 113, Air Diffusion Performance Index.

Develop a chemical emission rate testing laboratory for measuring the chemical emissions from building materials, furnishings, and equipment.

Principle Investigator of the California New Homes Study (2005-2007). Measured ventilation and indoor air quality in 108 new single family detached homes in northern and southern California.

Develop and teach IAQ professional development workshops to building owners, managers, hygienists, and engineers.

Air Pollution Engineer: Earth Metrics Inc., Burlingame, CA, October, 1985 to March, 1987.

Responsible for development of an air pollution laboratory including installation a forced choice olfactometer, tracer gas electron capture chromatograph, and associated calibration facilities. Field team leader for studies of fugitive odor emissions from sewage treatment plants, entrainment of fume hood exhausts into computer chip fabrication rooms, and indoor air quality investigations.

Staff Scientist: Building Ventilation and Indoor Air Quality Program, Energy and Environment Division, Lawrence Berkeley Laboratory, Berkeley, CA. January, 1980 to August, 1984.

Deputy project leader for the Control Techniques group; responsible for laboratory and field studies aimed at evaluating the performance of indoor air pollutant control strategies (i.e. ventilation, filtration, precipitation, absorption, adsorption, and source control).

Coordinated field and laboratory studies of air-to-air heat exchangers including evaluation of thermal performance, ventilation efficiency, cross-stream contaminant transfer, and the effects of freezing/defrosting.

Developed an *in situ* test protocol for evaluating the performance of air cleaning systems and introduced the concept of effective cleaning rate (ECR) also known as the Clean Air Delivery Rate (CADR).

Coordinated laboratory studies of portable and ducted air cleaning systems and their effect on indoor concentrations of respirable particles and radon progeny.

Co-designed an automated instrument system for measuring residential ventilation rates and radon concentrations.

Designed hardware and software for a multi-channel automated data acquisition system used to evaluate the performance of air-to-air heat transfer equipment.

Assistant Chief Engineer: Alta Bates Hospital, Berkeley, CA, October, 1979 to January, 1980.

Responsible for energy management projects involving installation of power factor correction capacitors on large inductive electrical devices and installation of steam meters on physical plant steam lines. Member of Local 39, International Union of Operating Engineers.

Manufacturing Engineer: American Precision Industries, Buffalo, NY, October, 1977 to October, 1979.

Responsible for reorganizing the manufacturing procedures regarding production of shell and tube heat exchangers. Designed customized automatic assembly, welding, and testing equipment. Designed a large paint spray booth. Prepared economic studies justifying new equipment purchases. Safety Director.

Project Engineer: Arcata Graphics, Buffalo, N.Y. June, 1976 to October, 1977.

Responsible for the design and installation of a bulk ink storage and distribution system and high speed automatic counting and marking equipment. Also coordinated material handling studies which led to the purchase and installation of new equipment.

PROFESSIONAL ORGANIZATION MEMBERSHIP

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

- Chairman of SPC-145P, Standards Project Committee - Test Method for Assessing the Performance of Gas Phase Air Cleaning Equipment (1991-1992)
- Member SPC-129P, Standards Project Committee - Test Method for Ventilation Effectiveness (1986-97)
  - Member of Drafting Committee
- Member Environmental Health Committee (1992-1994, 1997-2001, 2007-2010)
  - Chairman of EHC Research Subcommittee
  - Member of Man Made Mineral Fiber Position Paper Subcommittee
  - Member of the IAQ Position Paper Committee
  - Member of the Legionella Position Paper Committee
  - Member of the Limiting Indoor Mold and Dampness in Buildings Position Paper Committee
- Member SSPC-62, Standing Standards Project Committee - Ventilation for Acceptable Indoor Air Quality (1992 to 2000)
  - Chairman of Source Control and Air Cleaning Subcommittee
- Chairman of TC-4.10, Indoor Environmental Modeling (1988-92)
  - Member of Research Subcommittee
- Chairman of TC-2.3, Gaseous Air Contaminants and Control Equipment (1989-92)
  - Member of Research Subcommittee

American Society for Testing and Materials (ASTM)

- D-22 Sampling and Analysis of Atmospheres
  - Member of Indoor Air Quality Subcommittee
- E-06 Performance of Building Constructions

American Board of Industrial Hygiene (ABIH)

American Conference of Governmental Industrial Hygienists (ACGIH)

- Bioaerosols Committee (2007-2013)

American Industrial Hygiene Association (AIHA)

Cal-OSHA Indoor Air Quality Advisory Committee

International Society of Indoor Air Quality and Climate (ISIAQ)

- Co-Chairman of Task Force on HVAC Hygiene

U. S. Green Building Council (USGBC)
- Member of the IEQ Technical Advisory Group (2007-2009)
- Member of the IAQ Performance Testing Work Group (2010-2012)

Western Construction Consultants (WESTCON)

PROFESSIONAL CREDENTIALS

Licensed Professional Engineer - Mechanical Engineering

Certified Industrial Hygienist - American Board of Industrial Hygienists

SCIENTIFIC MEETINGS AND SYMPOSIA

Biological Contamination, Diagnosis, and Mitigation, Indoor Air'90, Toronto, Canada, August, 1990.

Models for Predicting Air Quality, Indoor Air'90, Toronto, Canada, August, 1990.

Microbes in Building Materials and Systems, Indoor Air '93, Helsinki, Finland, July, 1993.

Microorganisms in Indoor Air Assessment and Evaluation of Health Effects and Probable Causes, Walnut Creek, CA, February 27, 1997.

Controlling Microbial Moisture Problems in Buildings, Walnut Creek, CA, February 27, 1997.

Scientific Advisory Committee, Roomvent 98, 6th International Conference on Air Distribution in Rooms, KTH, Stockholm, Sweden, June 14-17, 1998.

Moisture and Mould, Indoor Air '99, Edinburgh, Scotland, August, 1999.

Ventilation Modeling and Simulation, Indoor Air '99, Edinburgh, Scotland, August, 1999.

Microbial Growth in Materials, Healthy Buildings 2000, Espoo, Finland, August, 2000.

Co-Chair, Bioaerosols X- Exposures in Residences, Indoor Air 2002, Monterey, CA, July 2002.

Healthy Indoor Environments, Anaheim, CA, April 2003.

Chair, Environmental Tobacco Smoke in Multi-Family Homes, Indoor Air 2008, Copenhagen, Denmark, July 2008.

Co-Chair, ISIAQ Task Force Workshop; HVAC Hygiene, Indoor Air 2002, Monterey, CA, July 2002.

Chair, ETS in Multi-Family Housing: Exposures, Controls, and Legalities Forum, Healthy Buildings 2009, Syracuse, CA, September 14, 2009.

Chair, Energy Conservation and IAQ in Residences Workshop, Indoor Air 2011, Austin, TX, June 6, 2011.

Chair, Electronic Cigarettes: Chemical Emissions and Exposures Colloquium, Indoor Air 2016, Ghent, Belgium, July 4, 2016.

SPECIAL CONSULTATION

Provide consultation to the American Home Appliance Manufacturers on the development of a standard for testing portable air cleaners, AHAM Standard AC-1.

Served as an expert witness and special consultant for the U.S. Federal Trade Commission regarding the performance claims found in advertisements of portable air cleaners and residential furnace filters.

Conducted a forensic investigation for a San Mateo, CA pro se defendant, regarding an alleged homicide where the victim was kidnapped in a steamer trunk. Determined the air exchange rate in the steamer trunk and how long the person could survive.

Conducted *in situ* measurement of human exposure to toluene fumes released during nailpolish application for a plaintiffs attorney pursuing a California Proposition 65 product labeling case. June, 1993.

Conducted a forensic *in situ* investigation for the Butte County, CA Sheriff's Department of the emissions of a portable heater used in the bedroom of two twin one year old girls who suffered simultaneous crib death.

Consult with OSHA on the 1995 proposed new regulation regarding indoor air quality and environmental tobacco smoke.

Consult with EPA on the proposed Building Alliance program and with OSHA on the proposed new OSHA IAQ regulation.

Johnson Controls Audit/Certification Expert Review; Milwaukee, WI. May 28-29, 1997.

Winner of the nationally published 1999 Request for Proposals by the State of Washington to conduct a comprehensive indoor air quality investigation of the Washington State Department of Ecology building in Lacey, WA.

Selected by the State of California Attorney General's Office in August, 2000 to conduct a comprehensive indoor air quality investigation of the Tulare County Court House.

Lawrence Berkeley Laboratory IAQ Experts Workshop: "Cause and Prevention of Sick Building Problems in Offices: The Experience of Indoor Environmental Quality Investigators", Berkeley, California, May 26-27, 2004.

Provide consultation and chemical emission rate testing to the State of California Attorney General's Office in 2013-2015 regarding the chemical emissions from e-cigarettes.

PEER-REVIEWED PUBLICATIONS :

F.J.Offermann, C.D.Hollowell, and G.D.Roseme, "Low-Infiltration Housing in Rochester, New York: A Study of Air Exchange Rates and Indoor Air Quality," *Environment International*, *8*, pp. 435-445, 1982.

W.W.Nazaroff, F.J.Offermann, and A.W.Robb, "Automated System for Measuring Air Exchange Rate and Radon Concentration in Houses," *Health Physics*, *45*, pp. 525-537, 1983.

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F.J.Offermann, "Ventilation Effectiveness and ADPI Measurements of a Forced Air Heating System," *ASHRAE Transactions* , Volume 94, Part 1, pp 694-704, 1988.

F.J.Offermann and D. Int-Hout "Ventilation Effectiveness Measurements of Three Supply/Return Air Configurations," *Environment International* , Volume 15, pp 585-592 1989.

F.J. Offermann, S.A. Loiselle, M.C. Quinlan, and M.S. Rogers, "A Study of Diesel Fume Entrainment in an Office Building," *IAQ '89*, The Human Equation: Health and Comfort, pp 179-183, ASHRAE, Atlanta, GA, 1989.

R.G.Sextro and F.J.Offermann, "Reduction of Residential Indoor Particle and Radon Progeny Concentrations with Ducted Air Cleaning Systems," submitted to *Indoor Air*, 1990.

S.A.Loiselle, A.T.Hodgson, and F.J.Offermann, "Development of An Indoor Air Sampler for Polycyclic Aromatic Compounds", *Indoor Air* , Vol 2, pp 191-210, 1991.

F.J.Offermann, S.A.Loiselle, A.T.Hodgson, L.A. Gundel, and J.M. Daisey, "A Pilot Study to Measure Indoor Concentrations and Emission Rates of Polycyclic Aromatic Compounds", *Indoor Air* , Vol 4, pp 497-512, 1991.

F.J. Offermann, S. A. Loiselle, R.G. Sextro, "Performance Comparisons of Six Different Air Cleaners Installed in a Residential Forced Air Ventilation System," *IAQ'91*, Healthy Buildings, pp 342-350, ASHRAE, Atlanta, GA (1991).

F.J. Offermann, J. Daisey, A. Hodgson, L. Gundell, and S. Loiselle, "Indoor Concentrations and Emission Rates of Polycyclic Aromatic Compounds", *Indoor Air,* Vol 4, pp 497-512 (1992).

F.J. Offermann, S. A. Loiselle, R.G. Sextro, "Performance of Air Cleaners Installed in a Residential Forced Air System," *ASHRAE Journal*, pp 51-57, July, 1992.

F.J. Offermann and S. A. Loiselle, "Performance of an Air-Cleaning System in an Archival Book Storage Facility," *IAQ'92*, ASHRAE, Atlanta, GA, 1992.

S.B. Hayward, K.S. Liu, L.E. Alevantis, K. Shah, S. Loiselle, F.J. Offermann, Y.L. Chang, L. Webber, “Effectiveness of Ventilation and Other Controls in Reducing Exposure to ETS in Office Buildings,” Indoor Air ’93, Helsinki, Finland, July 4-8, 1993.

F.J. Offermann, S. A. Loiselle, G. Ander, H. Lau, "Indoor Contaminant Emission Rates Before and After a Building Bake-out," *IAQ'93*, Operating and Maintaining Buildings for Health, Comfort, and Productivity, pp 157-163, ASHRAE, Atlanta, GA, 1993.

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F.J. Offermann, "Professional Malpractice and the Sick Building Investigator," *IAQ'96*, Paths to Better Building Environments, pp 132-136, ASHRAE, Atlanta, GA, 1996.

F.J. Offermann, "Standard Method of Measuring Air Change Effectiveness," *Indoor Air,* Vol 1, pp.206-211, 1999.

F. J. Offermann, A. T. Hodgson, and J. P. Robertson, "Contaminant Emission Rates from PVC Backed Carpet Tiles on Damp Concrete", Healthy Buildings 2000, Espoo, Finland, August 2000.

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F.J. Offermann, R. Colfer, P. Radzinski, and J. Robertson, "Exposure to Environmental Tobacco Smoke in an Automobile", Indoor Air 2002, Monterey, California, July 2002.

F. J. Offermann, J.P. Robertson, and T. Webster, "The Impact of Tracer Gas Mixing on Airflow Rate Measurements in Large Commercial Fan Systems", Indoor Air 2002, Monterey, California, July 2002.

M. J. Mendell, T. Brennan, L. Hathon, J.D. Odom, F.J.Offermann, B.H. Turk, K.M. Wallingford, R.C. Diamond, W.J. Fisk, "Causes and prevention of Symptom Complaints

in Office Buildings: Distilling the Experience of Indoor Environmental Investigators", submitted to Indoor Air 2005, Beijing, China, September 4-9, 2005.

F.J. Offermann, "Ventilation and IAQ in New Homes With and Without Mechanical Outdoor Air Systems", Healthy Buildings 2009, Syracuse, CA, September 14, 2009.

F.J. Offermann, "ASHRAE 62.2 Intermittent Residential Ventilation: What's It Good For, Intermittently Poor IAQ", IAQVEC 2010, Syracuse, CA, April 21, 2010.

F.J. Offermann and A.T. Hodgson, "Emission Rates of Volatile Organic Compounds in New Homes", Indoor Air 2011, Austin, TX, June, 2011.

P. Jenkins, R. Johnson, T. Phillips, and F. Offermann, "Chemical Concentrations in New California Homes and Garages", Indoor Air 2011, Austin, TX, June, 2011.

W. J. Mills, B. J. Grigg, F. J. Offermann, B. E. Gustin, and N. E. Spingarm, "Toluene and Methyl Ethyl Ketone Exposure from a Commercially Available Contact Adhesive", Journal of Occupational and Environmental Hygiene, 9:D95-D102 May, 2012.

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F. J. Offermann, A. T. Hodgson, P. L. Jenkins, R. D. Johnson, and T. J. Phillips, "Attached Garages as a Source of Volatile Organic Compounds in New Homes", HB 2012, Brisbane, CA, July, 2012.

R. Maddalena, N. Li, F. Offermann, and B. Singer, "Maximizing Information from Residential Measurements of Volatile Organic Compounds", HB 2012, Brisbane, AU, July, 2012.

W. Chen, A. Persily, A. Hodgson, F. Offermann, D. Poppendieck, and K. Kumagai, "Area-Specific Airflow Rates for Evaluating the Impacts of VOC emissions in U.S. Single-Family Homes", Building and Environment, Vol. 71, 204-211, February, 2014.

F. J. Offermann, A. Eagan A. C. Offermann, and L. J. Radonovich, "Infectious Disease Aerosol Exposures With and Without Surge Control Ventilation System Modifications", Indoor Air 2014, Hong Kong, July, 2014.

F. J. Offermann, "Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposures", Building and Environment, Vol. 93, Part 1, 101-105, November, 2015.

F. J. Offermann, "Formaldehyde Emission Rates From Lumber Liquidators Laminate Flooring Manufactured in China", Indoor Air 2016, Belgium, Ghent, July, 2016.

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"Buildings That Make You Sick: Indoor Air Pollution", Presented to the Sacramento Association of Professional Energy Managers, Sacramento, CA, November 18, 1986.

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NV, October 1-2, 1992; New York City, NY, October 26-27, 1992, Las Vegas, NV, March 18-19, 1993; Lake Tahoe, CA, July 14-15, 1994; Las Vegas, NV, April 3-4, 1995; Lake Tahoe, CA, July 11-12, 1996; Miami, Fl, December 9-10, 1996.

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"Operating Healthy Buildings", Association of Plant Engineers, Oakland, CA, November 14, 1991.

"Duct Cleaning Perspectives", Moderator of Seminar at the ASHRAE Semi-Annual Meeting, Indianapolis, IN, June 24, 1991.

"Duct Cleaning: The Role of the Environmental Hygienist," ASHRAE Annual Meeting, Anaheim, CA, January 29, 1992.

"Emerging IAQ Issues", Fifth National Conference on Indoor Air Pollution, University of Tulsa, Tulsa, OK, April 13-14, 1992.

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“Techniques for Airborne Disease Control”, EPRI Healthcare Initiative Symposium; San Francisco, CA; June 7, 1994.

“Diagnosing and Mitigating Indoor Air Quality Problems”, CIHC Conference; San Francisco, September 29, 1994.

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“Diagnostic Protocols for Building IAQ Assessment”, Local 39; Oakland, CA, October 3, 1995.

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“Demonstrating Compliance with ASHRAE 62-1989 Ventilation Requirements”, AIHA; October 25, 1995.

“IAQ Diagnostics: Hands on Assessment of Building Ventilation and Pollutant Transport”, EPA Region IX; Phoenix, AZ, March 12, 1996; San Francisco, CA, April 9, 1996; Burbank, CA, April 12, 1996.

“Experimental Validation of ASHRAE 129P: Standard Method of Measuring Air Change Effectiveness”, Room Vent ‘96 / International Symposium on Room Air Convection and Ventilation Effectiveness"; Yokohama, Japan, July 16-19, 1996.

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"ASHRAE Standard 62: Improving Indoor Environments", Pacific Gas and Electric Energy Center, San Francisco, CA, October 29, 1996.

"Operating and Maintaining Healthy Buildings", April 3-4, 1996, San Jose, CA; July 30, 1997, Monterey, CA.

"IAQ Primer", Local 39, April 16, 1997; Amdahl Corporation, June 9, 1997; State Compensation Insurance Fund's Safety & Health Services Department, November 21, 1996.

"Tracer Gas Techniques for Measuring Building Air Flow Rates", ASHRAE, Philadelphia, PA, January 26, 1997.

"How to Diagnose and Mitigate Indoor Air Quality Problems"; Women in Waste; March 19, 1997.

"Environmental Engineer: What Is It?", Monte Vista High School Career Day; April 10, 1997.

"Indoor Environment Controls: What's Hot and What's Not", Shaklee Corporation; San Francisco, CA, July 15, 1997.

"Measurement of Ventilation System Performance Parameters in the US EPA BASE Study", Healthy Buildings/IAQ'97, Washington, DC, September 29, 1997.

"Operations and Maintenance for Healthy and Comfortable Indoor Environments", PASMA; October 7, 1997.

"Designing for Healthy and Comfortable Indoor Environments", Construction Specification Institute, Santa Rosa, CA, November 6, 1997.

"Ventilation System Design for Good IAQ", University of Tulsa 10th Annual Conference, San Francisco, CA, February 25, 1998.

"The Building Shell", Tools For Building Green Conference and Trade Show, Alameda County Waste Management Authority and Recycling Board, Oakland, CA, February 28, 1998.

"Identifying Fungal Contamination Problems In Buildings", The City of Oakland Municipal Employees, Oakland, CA, March 26, 1998.

"Managing Indoor Air Quality in Schools: Staying Out of Trouble", CASBO, Sacramento, CA, April 20, 1998.

"Indoor Air Quality", CSOOC Spring Conference, Visalia, CA, April 30, 1998.

"Particulate and Gas Phase Air Filtration", ACGIH/OSHA, Ft. Mitchell, KY, June 1998.

"Building Air Quality Facts and Myths", The City of Oakland / Alameda County Safety Seminar, Oakland, CA, June 12, 1998.

"Building Engineering and Moisture", Building Contamination Workshop, University of California Berkeley, Continuing Education in Engineering and Environmental Management, San Francisco, CA, October 21-22, 1999.

"Identifying and Mitigating Mold Contamination in Buildings", Western Construction Consultants Association, Oakland, CA, March 15, 2000; AIG Construction Defect Seminar, Walnut Creek, CA, May 2, 2001; City of Oakland Public Works Agency, Oakland, CA, July 24, 2001; Executive Council of Homeowners, Alamo, CA, August 3, 2001.

"Using the EPA BASE Study for IAQ Investigation / Communication", Joint Professional Symposium 2000, American Industrial Hygiene Association, Orange County & Southern California Sections, Long Beach, October 19, 2000.

"Ventilation," Indoor Air Quality: Risk Reduction in the 21st Century Symposium, sponsored by the California Environmental Protection Agency/Air Resources Board, Sacramento, CA, May 3-4, 2000.

"Workshop 18: Criteria for Cleaning of Air Handling Systems", Healthy Buildings 2000, Espoo, Finland, August 2000.

"Closing Session Summary: 'Building Investigations' and 'Building Design & Construction', Healthy Buildings 2000, Espoo, Finland, August 2000.

"Managing Building Air Quality and Energy Efficiency, Meeting the Standard of Care", BOMA, MidAtlantic Environmental Hygiene Resource Center, Seattle, WA, May 23rd, 2000; San Antonio, TX, September 26-27, 2000.

"Diagnostics & Mitigation in Sick Buildings: When Good Buildings Go Bad," University of California Berkeley, September 18, 2001.

"Mold Contamination: Recognition and What To Do and Not Do", Redwood Empire Remodelers Association; Santa Rosa, CA, April 16, 2002.

"Investigative Tools of the IAQ Trade", Healthy Indoor Environments 2002; Austin, TX; April 22, 2002.

"Finding Hidden Mold: Case Studies in IAQ Investigations", AIHA Northern California Professionals Symposium; Oakland, CA, May 8, 2002.

"Assessing and Mitigating Fungal Contamination in Buildings", Cal/OSHA Training; Oakland, CA, February 14, 2003 and West Covina, CA, February 20-21, 2003.

"Use of External Containments During Fungal Mitigation", Invited Speaker, ACGIH Mold Remediation Symposium, Orlando, FL, November 3-5, 2003.

Building Operator Certification (BOC), 106-IAQ Training Workshops, Northwest Energy Efficiency Council; Stockton, CA, December 3, 2003; San Francisco, CA, December 9, 2003; Irvine, CA, January 13, 2004; San Diego, January 14, 2004; Irwindale, CA, January 27, 2004; Downey, CA, January 28, 2004; Santa Monica, CA, March 16, 2004; Ontario, CA, March 17, 2004; Ontario, CA, November 9, 2004, San Diego, CA, November 10, 2004; San Francisco, CA, November 17, 2004; San Jose, CA, November 18, 2004; Sacramento, CA, March 15, 2005.

"Mold Remediation: The National QUEST for Uniformity Symposium", Invited Speaker, Orlando, Florida, November 3-5, 2003.

"Mold and Moisture Control", Indoor Air Quality workshop for The Collaborative for High Performance Schools (CHPS), San Francisco, December 11, 2003.

"Advanced Perspectives In Mold Prevention & Control Symposium", Invited Speaker, Las Vegas, Nevada, November 7-9, 2004.

"Building Sciences: Understanding and Controlling Moisture in Buildings", American Industrial Hygiene Association, San Francisco, CA, February 14-16, 2005.

"Indoor Air Quality Diagnostics and Healthy Building Design", University of California Berkeley, Berkeley, CA, March 2, 2005.

"Improving IAQ = Reduced Tenant Complaints", Northern California Facilities Exposition, Santa Clara, CA, September 27, 2007.

"Defining Safe Building Air", Criteria for Safe Air and Water in Buildings, ASHRAE Winter Meeting, Chicago, IL, January 27, 2008.

"Update on USGBC LEED and Air Filtration", Invited Speaker, NAFA 2008 Convention, San Francisco, CA, September 19, 2008.

"Ventilation and Indoor air Quality in New California Homes", National Center of Healthy Housing, October 20, 2008.

"Indoor Air Quality in New Homes", California Energy and Air Quality Conference, October 29, 2008.

"Mechanical Outdoor air Ventilation Systems and IAQ in New Homes", ACI Home Performance Conference, Kansas City, MO, April 29, 2009.

"Ventilation and IAQ in New Homes with and without Mechanical Outdoor Air Systems", Healthy Buildings 2009, Syracuse, CA, September 14, 2009.

"Ten Ways to Improve Your Air Quality", Northern California Facilities Exposition, Santa Clara, CA, September 30, 2009.

"New Developments in Ventilation and Indoor Air Quality in Residential Buildings", Westcon meeting, Alameda, CA, March 17, 2010.

"Intermittent Residential Mechanical Outdoor Air Ventilation Systems and IAQ", ASHRAE SSPC 62.2 Meeting, Austin, TX, April 19, 2010.

"Measured IAQ in Homes", ACI Home Performance Conference, Austin, TX, April 21, 2010.

"Respiration: IEQ and Ventilation", AIHce 2010, How IH Can LEED in Green buildings, Denver, CO, May 23, 2010.

"IAQ Considerations for Net Zero Energy Buildings (NZEB)", Northern California Facilities Exposition, Santa Clara, CA, September 22, 2010.

"Energy Conservation and Health in Buildings", Berkeley High SchoolGreen Career Week, Berkeley, CA, April 12, 2011.

"What Pollutants are Really There ?", ACI Home Performance Conference, San Francisco, CA, March 30, 2011.

"Energy Conservation and Health in Residences Workshop", Indoor Air 2011, Austin, TX, June 6, 2011.

"Assessing IAQ and Improving Health in Residences", US EPA Weatherization Plus Health, September 7, 2011.

"Ventilation: What a Long Strange Trip It's Been", Westcon, May 21, 2014.

"Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposures", Indoor Air 2014, Hong Kong, July, 2014.

"Infectious Disease Aerosol Exposures With and Without Surge Control Ventilation System Modifications", Indoor Air 2014, Hong Kong, July, 2014.

"Chemical Emissions from E-Cigarettes", IMF Health and Welfare Fair, Washington, DC, February 18, 2015.

"Chemical Emissions and Health Hazards Associated with E-Cigarettes", Roswell Park Cancer Institute, Buffalo, NY, August 15, 2014.

"Formaldehyde Indoor Concentrations, Material Emission Rates, and the CARB ATCM", Harris Martin's Lumber Liquidators Flooring Litigation Conference, WQ Minneapolis Hotel, May 27, 2015.

"Chemical Emissions from E-Cigarettes: Direct and Indirect Passive Exposure", FDA Public Workshop: Electronic Cigarettes and the Public Health, Hyattsville, MD June 2, 2015.

"Creating Healthy Homes, Schools, and Workplaces", Chautauqua Institution, Athenaeum Hotel, August 24, 2015.

"Diagnosing IAQ Problems and Designing Healthy Buildings", University of California Berkeley, Berkeley, CA, October 6, 2015.

"Diagnosing Ventilation and IAQ Problems in Commercial Buildings", BEST Center Annual Institute, Lawrence Berkeley National Laboratory, January 6, 2016.

"A Review of Studies of Ventilation and Indoor Air Quality in New Homes and Impacts of Environmental Factors on Formaldehyde Emission Rates From Composite Wood Products", AIHce2016, May, 21-26, 2016.

"Admissibility of Scientific Testimony", Science in the Court, Proposition 65 Clearinghouse Annual Conference, Oakland, CA, September 15, 2016.

"Indoor Air Quality and Ventilation", ASHRAE Redwood Empire, Napa, CA, December 1, 2016.

EXHIBIT B

Shawn Smallwood, PhD
3108 Finch Street
Davis, CA 95616

Sean del Solar, Senior Planner
City of San Marcos
Planning Division
1 Civic Center Drive
San Marcos, CA 92069

18 May 2025

RE: Armorlite Lofts Project

Dear Mr. de Solar,

I write to comment on the DEIR/FEIR's analysis of potential impacts to biological resources from the proposed Armorlite Lofts Project, which I understand would add 165 residential units and 5,600 square-feet of commercial space and a covered parking garage within a building up to 74 feet tall on 2.44 acres in San Marcos, California. I am concerned that the DEIR mischaracterizes the existing environmental setting, and that its impacts analyses are flawed and its mitigation measures are inadequate.

My qualifications for preparing expert comments are the following. I hold a Ph.D. degree in Ecology from University of California at Davis, where I also worked as a post-graduate researcher in the Department of Agronomy and Range Sciences. My research has been on animal density and distribution, habitat selection, wildlife interactions with the anthrosphere, and conservation of rare and endangered species. I authored many papers on these and other topics. I served as Chair of the Conservation Affairs Committee for The Wildlife Society – Western Section. I am a member of The Wildlife Society and Raptor Research Foundation, and I've lectured part-time at California State University, Sacramento. I was Associate Editor of wildlife biology's premier scientific journal, The Journal of Wildlife Management, as well as of Biological Conservation, and I was on the Editorial Board of Environmental Management. I have performed wildlife surveys in California for thirty-seven years. My CV is attached.

THE WILDLIFE COMMUNITY AS BIOLOGICAL RESOURCE

Most environmental reviews pursuant to the California Environmental Quality Act (CEQA) focus on special-status species because CEQA's Checklist Evaluation of Environmental Impacts specifies that such evaluation includes potential impacts to special-status species. However, an important policy of CEQA is "to prevent the elimination of fish or wildlife species due to man's activities, insure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history." Pub. Res. Code § 21001(c). This policy is not restricted to special-status species, but applies to wildlife populations and plant and animal communities. In fact, the CEQA Guidelines Section 21155.1 defines wildlife habitat as "the ecological communities upon which wild animals, birds, plants, fish,

amphibians, and invertebrates depend for their conservation and protection." The CEQA Checklist Evaluation assigns priority to special-status species to balance information and cost, but it does not exclude the need to evaluate environmental impacts to other species, which, after all, are members of the very communities within which special-status species inter-depend for survival and reproduction.

All wildlife species should be of concern in a CEQA review, but the CEQA prioritizes special-status species. The species I consider to be special-status species are those listed in California's Special Animals List inclusive of threatened and endangered species under the California and federal Endangered Species Acts, candidates for listing under CESA and FESA, California's Fully Protected Species, California species of special concern, and California's Taxa to Watch List (https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406), continental and region-specific US Fish and Wildlife Service Birds of Conservation Concern (https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf), and naturally rare species such as raptors protected by California's Birds of Prey laws, Fish and Game Code Sections 3503, 3503.5, 3505 and 3513 (see https://wildlife.ca.gov/Conservation/Birds/Raptors).

SITE VISIT

On my behalf, Noriko Smallwood, a wildlife biologist with a Master's Degree from California State University Los Angeles, visited the site of the proposed project for 3.72 hours from 06:12 to 09:55 hours on 2 May 2025. She walked the site's perimeter where accessible, stopping to scan for wildlife with use of binoculars. Noriko recorded all species of vertebrate wildlife she detected, including those whose members flew over the site or were seen nearby, off the site. Animals of uncertain species identity were either omitted or, if possible, recorded to the Genus or higher taxonomic level.

Conditions were cloudy with 2 MPH northwest wind and temperatures of 56-63° F. Most of the site is covered in coastal sage scrub with a few mature ornamental trees (Photos 1 and 2).

Noriko saw Cooper's hawk (Photo 3), Vaux swift and yellow warbler (Photos 4 and 5), barn swallow and Anna's hummingbird (Photos 6 and 7), Cassin's kingbird and bushtit (Photos 8 and 9), house finch (Photo 10 and 11), orange-crowned warbler and lesser goldfinch (Photos 12 and 13), Bewick's wren and song sparrow (Photos 14 and 15), mourning dove and mallard (Photos 16 and 17), common raven and American crow (Photos 18 and 19), among the other species listed in Table 1. Noriko detected 26 species of vertebrate wildlife at or adjacent to the project site, including three species with special status (Table 1).

Noriko Smallwood certifies that the foregoing and following survey results are true and accurately reported.

Noriko Smallwood

Photos 1 and 2. *Views of the project site,* 2 May *2025. Photos by Noriko Smallwood.*

Photo 3. *Cooper's hawk on the project site,* 2 May *2025. Photo by Noriko Smallwood.*

Photos 4 and 5. *Vaux swift (left), and yellow warbler (right) on the project site,* 2 May *2025. Photos by Noriko Smallwood.*

Photos 6 and 7. *Barn swallow (left), and Anna's hummingbird (right) on the project site,* 2 May *2025. Photos by Noriko Smallwood.*

Photo 8. *Cassin's kingbird eating a dead honeybee on the project site,* 2 May *2025. Photo by Noriko Smallwood.*

Photo 9. *Bushtit with nest material on the project site,* 2 May *2025. Photo by Noriko Smallwood.*

Photos 10 and 11. *Juvenile house finch (left), and male and female house finches (right) on the project site,* 2 May *2025. Photos by Noriko Smallwood.*


Photos 12 and 13. *Singing orange-crowned warbler (left), and lesser goldfinch (right) on the project site,* 2 May *2025. Photos by Noriko Smallwood.*


Photos 14 and 15. *Bewick's wren (left), and song sparrow (right) on the project site,* 2 May *2025. Photos by Noriko Smallwood.*

Photos 16 and 17. *Mourning dove (left), and mallard (right) flying over the project site,* 2 May *2025. Photos by Noriko Smallwood.*

Photos 18 and 19. *Common raven (left), and American crow (right), flying over the project site,* 2 May *2025. Photos by Noriko Smallwood.*

Table 1. *Species of wildlife Noriko observed during 3.72 hours of survey on 2 May 2025.*

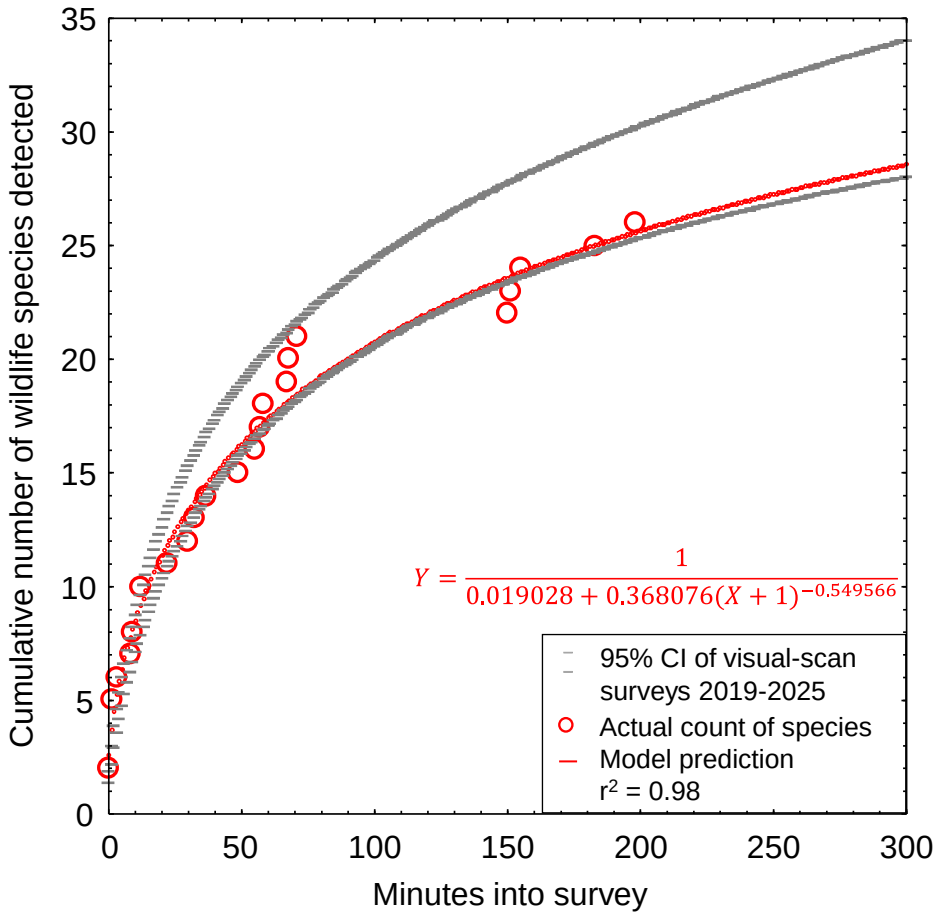
Common name	***Species name***	**Status**[1]	**Notes**
Mallard	*Anas platyrhynchos*		Flew over
Mourning dove	*Zenaida macroura*		
Vaux's swift	*Chaetura vauxi*	SSC3	Foraged over site
Anna's hummingbird	*Calypte anna*		Territorial
Killdeer	*Charadrius vociferus*		Just off site
Cooper's hawk	*Accipiter cooperii*	WL, BOP, CSD1	Perched in tree
Cassin's kingbird	*Tyrannus vociferans*		Nesti just offsite, foraged on dead bees on site
American crow	*Corvus brachyrhynchos*		
Common raven	*Corvus corax*		Circled over
Northern rough-winged swallow	*Stelgidopteryx serripennis*		Flew over
Barn swallow	*Hirundo rustica*		Flew over
Bushtit	*Psaltriparus minimus*		Gathered material from site for nest just off site
Cedar waxwing	*Bombycilla cedrorum*		Flew over
Bewick's wren	*Thryomanes bewickii*		
European starling	*Sturnus vulgaris*	Non-native	
House finch	*Haemorphous mexicanus*		Juvenile begged for food
Lesser goldfinch	*Spinus psaltria*		
Song sparrow	*Melospiza melodia*		Perched, sang
California towhee	*Melozone crissalis*		
Red-winged blackbird	*Agelaius phoeniceus*		Flew over
Orange-crowned warbler	*Oreothlypis celata*		Perched, sang
MacGillivray's warbler	*Geothlypis tolmiei*		Called
Yellow warbler	*Setophaga petechia*	SSC2, CSD2	Perched in tree
Wilson's warbler	*Cardellina pusilla*		
Desert cottontail	*Sylvilagus audubonii*		Scat
Botta's pocket gopher	*Thomomys bottae*		Burrows

[1] Listed on Special Animals List as SSC = California Species of Special Concern (see Shuford and Gardali 2008 for numbers indicating priority of concern) or WL = Taxa to Watch List (https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406); listed by U.S. Fish and Wildlife Service as BCC = Bird of Conservation Concern (https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf); protected as BOP = Birds of Prey (California Fish and Game Code 3503.5), and as CSD1 and CSD2 = Group 1 and Group 2 species on County of San Diego Sensitive Animal List (County of San Diego 2010).

Noriko detected many species for the brief time she had available to survey the project site. However, the species of wildlife Noriko detected at the project site comprised only a sampling of the species that were present during her survey. To demonstrate this, I fit a nonlinear regression model to Noriko's cumulative number of vertebrate species detected with time into her survey to predict the number of species that she would have detected with a longer survey or perhaps with additional biologists available to assist her. The model is a logistic growth model which reaches an asymptote that corresponds

with the maximum number of vertebrate wildlife species that could have been detected during the survey. The model fit to Noriko's survey data predicts 53 species of vertebrate wildlife were available to be detected during her survey, or 27 more species than she detected (Figure 1). It also reveals that her rate of species detections were average relative to 19 other sites we have surveyed in California's south coast region; in other words, the data reveal there is nothing diminished about the wildlife community as compared to communities on other project sites in the region.

Figure 1. *Actual and predicted relationships between the numbers of vertebrate wildlife species detected and the elapsed survey time based on Noriko's visual-scan survey on 2 May 2025.*



Unknown are the identities of the species Noriko missed, but the species that Noriko did and did not detect on 2 May 2025 composed only a fraction of the species that would occur at the project site over the period of a year or longer. This is because many species are seasonal in their occurrence, some require more survey effort because they are highly cryptic, and the members of other species would visit the site only periodically while patrolling large home ranges. A survey on a single date cannot possibly detect all of the species of the local wildlife community.

At least a year's worth of surveys would be needed to more accurately report the number of vertebrate species that occur at the project site, but I only have Noriko's one survey. However, by use of an analytical bridge, a modeling effort applied to a large, robust data set from a research site can predict the number of vertebrate wildlife species that likely make use of the site over the longer term. This analytical bridge draws inference from

the pattern of species detections more than it from the research site, and I note that the pattern, i.e., rate, of species detections is consistent from site to site.

As part of my research, I completed a much larger survey effort across 167 km² of annual grasslands of the Altamont Pass Wind Resource Area, where from 2015 through 2019 I performed 721 1-hour visual-scan surveys, or 721 hours of surveys, at 46 stations. I used binoculars and otherwise the methods were the same as the methods I and other consulting biologists use for surveys at proposed project sites. At each of the 46 survey stations, I tallied new species detected with each sequential survey at that station, and then related the cumulative species detected to the hours (number of surveys, as each survey lasted 1 hour) used to accumulate my counts of species detected. I used combined quadratic and simplex methods of estimation in Statistica to estimate least-squares, best-fit nonlinear models of the number of cumulative species detected regressed on hours of survey (number of surveys) at the station: $\hat{R} = \frac{1}{1/a+b\times(Hours)^c}$, where $\hat{R}$ represented cumulative species richness detected. The coefficients of determination, r^2, of the models ranged 0.88 to 1.00, with a mean of 0.97 (95% CI: 0.96, 0.98); or in other words, the models were excellent fits to the data.

I projected the predictions of each model to thousands of hours to find predicted asymptotes of wildlife species richness. The mean model-predicted asymptote of species richness was 57 after 11,857 hours of visual-scan surveys among the 46 stations of my research site. I also averaged model predictions of species richness at each incremental increase of number of surveys, i.e., number of hours (Figure 2). On average I would have detected 14.5 species over my first 3.72 hours of surveys at my research site in the Altamont Pass (3.72 hours to match the 3.72 hours Noriko surveyed at the project site), which composed 25.5% of the predicted total number of species I would detect with a much larger survey effort at the research site. Given the example illustrated in Figure 2, the 26 species Noriko detected after her 3.72 hours of survey at the project site likely represented 25.5% of the species to be detected after many more visual-scan surveys over another year or longer. With many more repeat surveys through the year, Noriko would likely detect $26/0.25 = 102$ species of vertebrate wildlife at the site. Assuming Noriko's ratio of special-status to non-special-status species was to hold through the detections of all 102 predicted species, then continued surveys would eventually detect 12 special-status species of vertebrate wildlife.

Because my prediction of 102 species of vertebrate wildlife, including 12 special-status species of vertebrate wildlife, is derived from daytime visual-scan surveys, and would detect few nocturnal mammals such as bats, the true number of species composing the wildlife community of the site must be larger. Noriko's reconnaissance survey should serve only as a starting point toward characterization of the site's wildlife community, but it certainly cannot alone inform of the inventory of species that use the site. More surveys are needed than her one survey to inventory the project site's wildlife community. Nevertheless, the large number of species I predict at the project site is indicative of a relatively species-rich wildlife community that warrants a serious survey effort.

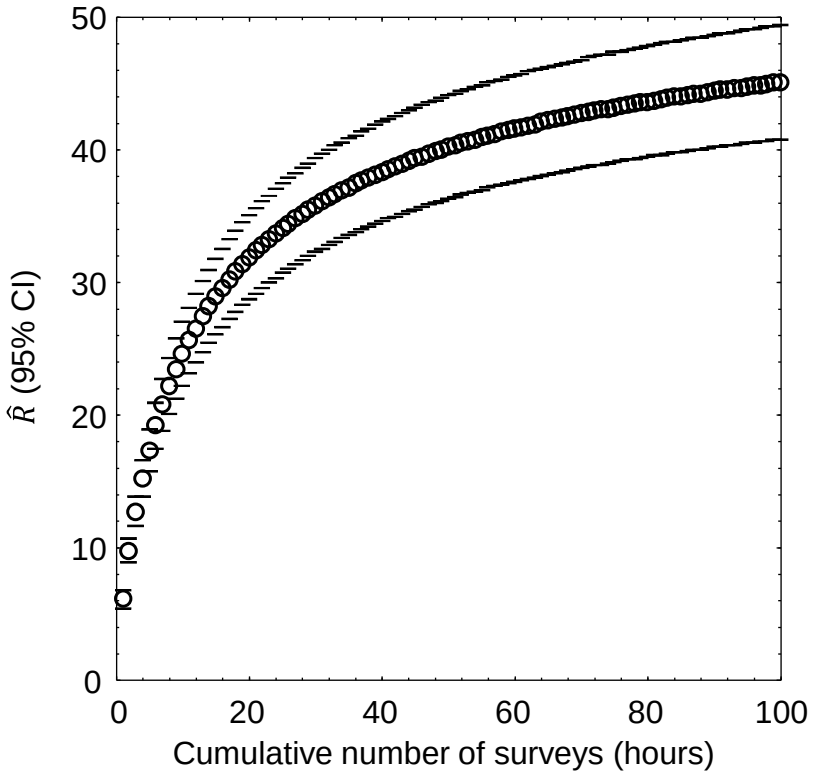


Figure 2. *Mean (95% CI) predicted wildlife species richness, $\hat{R}$, as a nonlinear function of hour-long survey increments across 46 visual-scan survey stations across the Altamont Pass Wind Resource Area, Alameda and Contra Costa Counties, 2015–2019. Note that the location of the study is largely irrelevant to the utility of the graph to the interpretation of survey outcomes at the project site. It is the pattern in the data that is relevant, because the pattern is typical of the pattern seen elsewhere.*

EXISTING ENVIRONMENTAL SETTING

The first step in analysis of potential project impacts to biological resources is to accurately characterize the existing environmental setting, including the wildlife community and any key ecological relationships and known and ongoing threats to special-status species. A reasonably accurate characterization of the environmental setting can provide the baseline against which to analyze potential project impacts. For these reasons, characterization of the environmental setting, including the project site's regional setting, is one of the CEQA's essential analytical steps. Methods to achieve this first step typically include (1) surveys of the site for biological resources, and (2) reviews of literature, databases and local experts for documented occurrences of special-status species. In the case of the proposed project, these required steps remain incomplete and misleading.

Environmental Setting informed by Field Surveys

To the CEQA's primary objective to disclose potential environmental impacts of a proposed project, the analysis should be informed of which biological species are known to occur at the proposed project site, which special-status species are likely to occur, as well as the limitations of the survey effort directed to the site. Analysts need this information to characterize the environmental setting as a basis for opining on, or predicting, potential project impacts to biological resources.

Dudek (2024) reports having completed a reconnaissance survey on 11 June 2023 for the stated purpose of performing a general habitat assessment. Dudek neglects to report its survey methodology, nor does it explain what or how the general habitat assessment was conducted. Dudek (2024) is grossly deficient in its reporting of the survey.

The survey began at 15:00 hours, which is a time of day when wildlife activity is at its lowest. Not surprisingly, considering the survey start time, the DEIR (p. 3.3-7) reports, "A total of 16 wildlife species were observed at the project site, all of which consisted of native species." That all 16 species were native species should have been cited as evidence that the project site is ecologically intact and in reasonably good condition, because the presence of non-native species is indicative of wildlife communities in poorer condition. During her survey, Noriko Smallwood detected only one non-native species, thus reinforcing the evidence that the site is largely intact, ecologically, and in good condition.

A larger issue, however, is that Dudek's biologist detected only 62% of the number of species Noriko detected during her brief survey. Dudek's biologist detected eight species that Noriko did not detect, but Noriko detected 18 species that Dudek's biologist did not detect. In fact, applying the Sørenson $Index\ of\ Similarity = \frac{2c}{a+b}$ (Sørenson 1948), where *a* is the number of species found by Dudek, *b* is the number of species found by Noriko, and *c* is the number of species found by both Dudek and Noriko, the Index of Similarity of the two detected portions of the wildlife community is only 0.38. For perspective, the mean Index of Similarity among 40 comparisons of 2-hour surveys I completed at a given site in Rancho Cordova, California, on dates spread over three years, 2020-2023, was 0.755 with a high value of 0.90. An Index value of 0.38 is very low, indicating the survey outcomes were more different than they were alike between Dudek and Noriko. Combined, the two surveys detected 34 species of vertebrate wildlife, but even this number remains many fewer species than composes the project site's wildlife community. The survey effort committed to the DEIR/FEIR is inadequate for accurately characterizing the wildlife community as part of the existing environmental setting.

I also note that the same list of species detected is reported by Dudek (2024) for it's reconnaissance survey and by Muri (2023) for her focused California gnatcatcher surveys. It is highly unlikely that the same list of species resulted from both survey efforts, so something is misleading about the reporting.

Focused surveys for California gnatcatcher were completed (Muri 2023). Muri's surveys mostly achieved the minimum standards of USFWS (1997), although there is no indication the USFWS was notified in advance of the surveys (Table 2). Also, no breeding season surveys were completed even though the 1997 guidelines stipulate the need for them (Table 2).

The DEIR (p. 3.3-8) reports, "Due to lack of suitable habitat, no other focused special-status wildlife species surveys were conducted within the project site (Dudek 2024)." However, this statement is unfounded for Crotch's bumble bee, Dulzura pocket mouse, and northwestern San Diego pocket mouse, as noted by the comments of CDFW. The above-quoted statement, and Dudek's (2024:21) claim that "no other listed species have

a moderate to high potential to occur on site," were also refuted by Noriko Smallwood, who detected three special-status species on the project site, including Vaux's swift, yellow warbler, and Cooper's hawk. With additional survey effort, more special-status species would be detected on the project site. More focused surveys for special-status species are warranted.

According to Dudek (2024), no surveys were completed for bats because bats would not roost on site due to its small size and lack of cliffs. This reasoning is misleading and unfounded, as bats roost on many substrates other than cliffs, and bats range over much larger areas than the area of the project site. Bats undoubtedly forage in the area, and bats undoubtedly forage on the project site. Bat surveys should have been completed. The FEIR is deficient without disclosing anything meaningful about which species rely on the project site for their survival or reproduction.

Most of the minimum standards of CDFW's (2018) rare plant species guidelines were achieved by Dudek (2024) (see Table 3). The DEIR (p. 3.3-6) reports that "On May 25, 2023 and July 12, 2023, focused surveys for special-status plants were conducted on site by Dudek biologist Kathleen Dayton. This survey was conducted at the appropriate phenological stage to detect and identify target species. Reference checks were conducted for key target species. Thread-leaved brodiaea (*Brodiaea filifolia*) and Orcutt's brodiaea (*Brodiaea orcuttii*) were observed just starting to bloom on May 10, 2023, in San Marcos. Orcutt's brodiaea (*Brodiaea orcuttii*) was observed again in early bloom on May 17, 2023, and still in bloom on June 27, 2023. Southern tarplant (*Centromadia parryi* ssp. *Australis*) was observed in full bloom on reference sites on July 11, 2023. … Field survey methods conformed to California Native Plant Society (CNPS) Botanical Survey Guidelines; Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities; and General Rare Plant Survey Guidelines. Surveys were conducted by walking meandering transects throughout the project site to detect special-status species. … No special-status plants were observed on site." In my opinion, more surveys should have been completed, and more information should have been reported about the reference site and potential survey limitations (Table 3).

Table 2. *Assessment of whether surveys achieved the minimum standards in the USFWS's recommended California gnatcatcher survey protocol.*

Standard in USFWS (1997)	**Assessment of surveys performed**	**Was the standard met?**
Permitted biologists notify the Service ≥10 days before intended surveys	I did not see a report of notification	No
If within NCCP process, then complete 3 surveys separated by ≥7 days between 15 March and 30 June		---
If outside NCCP process, then complete 6 surveys separated by ≥7 days between 15 March and 30 June, and 9 surveys separated by ≥14 days between 1 July and 14 March	Completed only the 9 surveys outside the breeding season, and no breeding-season surveys	No
Surveys shall be conducted between 06:00 and 12:00 Hours		Yes
Surveys shall avoid excessive heat, wind, rain, fog, or other inclement weather		Yes
Surveys are to be call-back surveys until individuals first detected		Yes
Slowly walk survey routes covering ≤40 ha/day in the NCCP process and ≤32 ha/day otherwise		Yes
Report survey locations, names of survey personnel, methods used, ha covered by each biologist, numbers of surveys, dates, start and stop times of surveys, weather conditions at the start of each survey, and numbers of times recordings of gnatcatcher vocalizations were broadcast		Yes
Report descriptions of the vegetation communities surveyed, number, age and sex of gnatcatchers detected, and provision of all data and field notes		Yes

Table 3. *Summary crosswalk of survey steps completed and CDFW's (2018) minimum standards of survey conduct.*

Standard in CDFG (2018)	Assessment of surveys completed	Was the standard met?
Purpose and Timing to adequately disclose potential impacts pursuant to CEQA		
Qualifications		
Knowledge of plant taxonomy and natural community ecology	Only states that Dudek has knowledge	No
Familiarity with plants of the region, including special status plants	Only states that Dudek has knowledge	No
Familiarity with natural communities of region, including sensitive natural communities	Only states that Dudek has knowledge	No
Experience with the CNDDB, BIOS, and Survey of California Vegetation Classification and Mapping Standards	Apparent from reporting	Yes
Experience conducting floristic botanical field surveys as described in this document, or experience conducting such botanical field surveys under the direction of an experienced botanical field surveyor	No information provided	No
Familiarity with federal, state, and local statutes and regulations related to plants and plant collecting	Apparent from reporting	Yes
Experience analyzing the impacts of projects on native plant species and sensitive natural communities	Assumed yes	Yes
Survey Preparation		
Compile relevant botanical information in the general project area to provide a regional context, i.e., data base review, and to generally identify vegetation and habitat types potentially occurring in the project area based on biological and physical properties (e.g., soils) of the project area		
Develop list of special status plants and sensitive natural communities with potential to occur within the vegetation and habitat types identified (special status plants and sensitive natural communities in a project area may not be limited to those on the list)		Yes
Survey Design		
Survey extent should cover entire project area, including areas that will be directly or indirectly impacted by the project, and adjoining properties	"throughout project site"	Yes

Use systematic field techniques, e.g., parallel transects, in all habitats of the project area to ensure thorough coverage	Surveyed meandering transects on foot	No
Survey at the times of year when plants will be both evident and identifiable, usually during flowering or fruiting		Yes
Space (multiple) survey visits throughout the growing season to accurately determine what plants exist in the project area	Only two surveys	Partial
When special status plants are known to occur in the type(s) of habitat present in a project area, observe reference sites to determine whether those plants are identifiable at the times of year the surveys take place; Describe reference site(s), if visited, and phenological development of special status plant(s) at those reference sites	Reference site is mentioned, but its location not reported	No
Survey Methods		
Identify names and qualifications of botanical field surveyor(s)	Names reported, but no qualifications	Yes
Dates of surveys (indicating the botanical field surveyor(s) that surveyed each area on each survey date)	Two dates reported	Yes
Total person-hours spent	4.45 hours	Yes
Discuss survey preparation methodology		No
List special status plants and sensitive natural communities with potential to occur in the region; identify all taxa to level necessary to determine whether they are special status		Yes
Describe and map the area surveyed relative to the project area		Yes
Reporting		
Describe the proposed project		Yes
Discuss all adverse conditions in the botanical survey report	No mention	
Document all plant taxa observed		Yes
Detailed data and maps for all special status plants and sensitive natural communities detected	None reportedly found	---
Report specific geographic locations where the special status plants and sensitive natural communities were found, usually via GPS	None reportedly found	---
Site-specific characteristics of occurrences, such as associated species, habitat and microhabitat, structure of vegetation, topographic features, soil type, texture, and soil parent material. If in wetland, describe direction of flow and	None reportedly found	---

integrity of surface or subsurface hydrology and adjacent off-site hydrological influences as appropriate		
The number of individuals in each special status plant population as counted (if population is small) or estimated (if population is large)	None reportedly found	---
Percentage of each special status plant in each life stage such as seedling, vegetative, flowering, and fruiting	None reportedly found	---
Density of special status plants	None reportedly found	---
Digital images of special status plants and sensitive natural communities in the project area, with diagnostic features	None reportedly found	---
Detailed map of the project area that identifies topographic and landscape features and includes a north arrow and bar scale		Yes
Vegetation map of project area using Survey of California Vegetation Classification and Mapping Standards at thematic and spatial scale that allows the display of all sensitive natural communities		Yes
Soil map of the project area		Yes
Describe biological setting, including all natural communities, geological and hydrological characteristics, and land use or management history		Yes
Discuss potential for a false negative botanical field survey		No
Discuss how climatic conditions may have affected survey results		No
Discuss how survey timing may affect comprehensiveness		No
List references used, including persons contacted and herbaria visited		No

Environmental Setting informed by Desktop Review

The purpose of literature and database reviews and of consulting with local experts is to inform the field survey, and to augment interpretation of its outcome. Analysts need this information to identify which species are known to have occurred at or near the project site, and to identify which other special-status species could conceivably occur at the site due to geographic range overlap and migration flight paths.

The DEIR's desktop review in support of its habitat assessments is misleading and inaccurate. According to Dudek (2024:34), "The proposed Project site does not support any special-status wildlife species and none are considered as having a moderate or high potential to occur; therefore construction of the project will not result in direct or indirect impacts to any special-status wildlife species." Yet, Noriko Smallwood detected three special-status species on the project site, and my desktop review reveals many special-status species occurrences that are close enough to warrant more focused analyses and surveys.

Dudek (2024) did not reportedly review eBird (https://eBird.org) or iNaturalist (https://www.inaturalist.org) for documented occurrence records at or near the project site. Instead, Dudek (2024) queried the California Natural Diversity Data Base (CNDDB) for documented occurrences of special-status species within one USGS Quadrangle of the project site. By doing so, Dudek (2024) screened out many special-status species from further consideration in the characterization of the wildlife community as part of the existing environmental setting. CNDDB is not designed to support absence determinations or to screen out species from characterization of a site's wildlife community. As noted by the CNDDB, "*The CNDDB is a positive sighting database. It does not predict where something may be found. We map occurrences only where we have documentation that the species was found at the site. There are many areas of the state where no surveys have been conducted and therefore there is nothing on the map. That does not mean that there are no special status species present.*" Dudek (2024) and the DEIR/FEIR misuse the CNDDB.

The CNDDB relies entirely on volunteer reporting from biologists who were allowed access to whatever properties they report from. Many properties have never been surveyed by biologists. Many properties have been surveyed, but the survey outcomes never reported to the CNDDB. Many properties have been surveyed multiple times, but not all survey outcomes reported to the CNDDB. Furthermore, the CNDDB is interested only in the findings of special-status species, which means that species more recently assigned special status will have been reported many fewer times to CNDDB than were species assigned special status since the inception of the CNDDB. The lack of many CNDDB records for species recently assigned special status had nothing to do with whether the species' geographic ranges overlapped the project site, but rather more to do with the brief time for records to have accumulated since the species were assigned special status. And because negative findings are not reported to the CNDDB, the CNDDB cannot provide the basis for estimating occurrence likelihoods, either.

In my assessment based on a database review and a site visit, 145 special-status species of wildlife are known to occur near enough to the site to warrant analysis of occurrence potential (Table 4). Of these 145 species, 3 (2%) were recorded on or just off the project site, and another 40 (28%) species have been documented within 1.5 miles of the site (Very close), another 29 (20%) within 1.5 and 4 miles (Nearby), and another 64 (44%) within 4 to 30 miles (In region). Half (50%) of the species in Table 4 have been reportedly seen within 4 miles of the project site. The site therefore supports multiple special-status species of wildlife and carries the potential for supporting many more special-status species of wildlife based on the proximities of recorded occurrences. The site is far richer in special-status species than the City would have the reader believe.

Of the 145 special-status species listed in Table 4, the DEIR/FEIR analyses the occurrence likelihoods of only 25 (17%) of them. Of these 25 special-status species, 13 are reportedly given only low likelihood to occur, and 12 are not expected to occur, but of these, five (20%) have been recorded within only 1.5 miles of the site, three have been reported between 1.5 and 4 miles of the site, and 12 have been reported between 4 and 30 miles of the site. The occurrence likelihoods assigned to these 25 species largely fail to comport with the available occurrence records in public databases.

Of the 145 special-status species listed in Table 4, the DEIR/FEIR fails to analyze the occurrence likelihoods of 83% of them. Of these species not analyzed for occurrence potential, Noriko detected three of them on site, and occurrence records of 35 (29%) of them have been recorded within 1.5 miles of the site. The desktop review of the DEIR/FEIR is grossly incomplete and therefore deficient.

Furthermore, I agree with CDFW's comments that inadequate effort was made to detect San Diego pocket mouse and Dulzura pocket mouse, and that either or both species could occur. The desktop review assigns only low likelihoods of occurrence to these species, but the reasoning in support of these assignments are merely speculative. The same reasoning applies to the other species assessed for occurrence likelihoods as well. The DEIR/FEIR should be withdrawn from public circulation, and then revised based on a more careful and thorough desktop review.

Table 4. *Occurrence likelihoods of special-status bird species at or near the proposed project site, according to eBird/iNaturalist records (https://eBird.org, https://www.inaturalist.org) and on-site survey findings, where 'Very close' indicates within 1.5 miles of the site, "nearby" indicates within 1.5 and 4 miles, and "in region" indicates within 4 and 30 miles, and 'in range' means the species' geographic range overlaps the site. MSCP cover refers to whether incidental take of the specie is covered by the San Diego Multiple Species Conservation Program. Entries in bold font identify those species detected by Noriko Smallwood.*

Common name	***Species name***	**Status[1]**	**MSCP cover**	**Occurrence likelihood**	
				DEIR	**Database records, Site visits**
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT			In region
San Diego fairy shrimp	*Branchinecta sandiegonensis*	FE, CSD1	Yes	Not expected	In region
Riverside fairy shrimp	*Streptocephalus woottoni*	FE	Yes	Not expected	In region
Wandering skipper	*Panoquina errans*	CSD1			In region
Quino checkerspot butterfly	*Euphydryas editha quino*	FE, CSD1	Yes		In region
Monarch	*Danaus plexippus*	FC, CSD2			Very close
Crotch's bumble bee	*Bombus crotchii*	CCE			Very close
Western spadefoot	*Spea hammondii*	SSC, CSD2	Yes	Not expected	In region
Western pond turtle	*Emys marmorata*	FC, SSC	Yes		In region
San Diego banded gecko	*Coleonyx variegatus abbotti*	SSC, CSD1			In region
Coast horned lizard	*Phrynosoma blainvillii*	SSC, CSD2	Yes	Low	Nearby
Coronado skink	*Plestiodon skiltonianus interparietalis*	WL, CSD2			In region
Orange-throated whiptail	*Aspidoscelis hyperythra*	WL, CSD2	Yes	Low	Very close
Coastal whiptail	*Aspidoscelis tigris stejnegeri*	SSC, CSD2			Nearby
San Diegan legless lizard	*Anniella stebbinsi*	SSC		Low	In region
Coastal rosy boa	*Lichanura trivirgata*	CSD2			Very close
California glossy snake	*Arizona elegans occidentalis*	SSC, CSD2			In region
San Diego ringneck snake	*Diadophis punctatus similis*	CSD2			Nearby
Coast patchnose snake	*Salvadora hexalepis virgultea*	SSC, CSD2		Low	In region
Two-striped gartersnake	*Thamnophis hammondii*	SSC, CSD1	Yes		In region
South coast garter snake	*Thamnophis sirtalis pop. 1*	SSC, CSD2			In region
Red diamond rattlesnake	*Crotalus ruber*	SSC, CSD2	Yes		Very close

Common name	***Species name***	**Status[1]**	**MSCP cover**	**Occurrence likelihood**	
				DEIR	**Database records, Site visits**
Brant	*Branta bernicla*	SSC2			In region
Cackling goose (Aleutian)	*Branta hutchinsii leucopareia*	WL			In region
Moffitt's Canada goose	*Branta canadensis moffitti*	CSD2			Nearby
Redhead	*Aythya americana*	SSC2, CSD2			Nearby
Western grebe	*Aechmophorus occidentalis*	BCC, CSD1			Nearby
Clark's grebe	*Aechmophorus clarkii*	BCC			Nearby
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FT, CE, CSD1			In region
Black swift	*Cypseloides niger*	SSC3, BCC, CSD2			In region
Vaux's swift	*Chaetura vauxi*	SSC			**On site**
Calliope hummingbird	*Selasphorus calliope*	BCC			Nearby
Rufous hummingbird	*Selasphorus rufus*	BCC			Very close
Allen's hummingbird	*Selasphorus sasin*	BCC			Very close
Light-footed Ridgway's rail	*Rallus obsoletus levipes*	FE, CE, CFP		Not expected	In region
Mountain plover	*Charadrius montanus*	SSC2, BCC, CSD2			In region
Snowy plover	*Charadrius nivosus*	BCC			In region
Western snowy plover	*Charadrius nivosus nivosus*	FT, SSC			In region
Long-billed curlew	*Numenius americanus*	WL, CSD2			In region
Marbled godwit	*Limosa fedoa*	BCC			In region
Red knot (Pacific)	*Calidris canutus*	BCC			In region
Short-billed dowitcher	*Limnodromus griseus*	BCC			In region
Willet	*Tringa semipalmata*	BCC			In region
Laughing gull	*Leucophaeus atricilla*	WL, CSD2			In region
Heermann's gull	*Larus heermanni*	BCC			In region
Western gull	*Larus occidentalis*	BCC			Very close
California gull	*Larus californicus*	BCC, WL, CSD2			Very close
California least tern	*Sternula antillarum browni*	FE, CE, CFP, CSD1			In region
Gull-billed tern	*Gelochelidon nilotica*	BCC, SSC3			In region

Common name	***Species name***	**Status[1]**	**MSCP cover**	**Occurrence likelihood**	
				DEIR	**Database records, Site visits**
Black tern	*Chlidonias niger*	SSC2, BCC, CSD2			In region
Elegant tern	*Thalasseus elegans*	BCC, WL, CSD1			In region
Black skimmer	*Rynchops niger*	BCC, SSC3, CSD1			In region
Common loon	*Gavia immer*	SSC, CSD2			In region
Wood stork	*Mycteria americana*	SSC1, CSD2			In region
Brandt's cormorant	*Urile penicillatus*	BCC			In region
Double-crested cormorant	*Phalacrocorax auritus*	WL, CSD2			Very close
American white pelican	*Pelacanus erythrorhynchos*	SSC1, CSD2			Very close
Least bittern	*Ixobrychus exilis*	SSC2, CSD2			Nearby
Great blue heron	*Ardea herodias*	CSD2			Very close
Reddish egret	*Egretta rufescens*	CSD2			In region
Green heron	*Butorides striatus*	CSD2			Very close
White-faced ibis	*Plegadis chihi*	WL, CSD1	Yes		Very close
Turkey vulture	*Cathartes aura*	BOP, CSD1			Very close
Osprey	*Pandion haliaetus*	WL, BOP, CSD1	Yes		Very close
White-tailed kite	*Elanus leucurus*	CFP, BOP, CSD1			Very close
Golden eagle	*Aquila chrysaetos*	BGEPA, BOP, WL, CFP, CSD1	Yes		Nearby
Northern harrier	*Circus cyaneus*	SSC3, BCC, BOP, CSD1	Yes	Not expected to nest	Very close
Sharp-shinned hawk	*Accipiter striatus*	WL, BOP, CSD1			Very close
Cooper's hawk	*Accipiter cooperi*	WL, BOP, CSD1			**On site**
Bald eagle	*Haliaeetus leucocephalus*	CE, BGEPA, BOP CSD1			Nearby
Red-shouldered hawk	*Buteo lineatus*	BOP, CSD1			Very close
Swainson's hawk	Buteo swainsoni	CT, BOP, CSD1			Nearby
Zone-tailed hawk	*Buteo albonotatus*	BOP			Nearby
Red-tailed hawk	*Buteo jamaicensis*	BOP			Very close
Ferruginous hawk	*Buteo regalis*	BOP, WL, CSD1			Nearby

Common name	***Species name***	**Status[1]**	**MSCP cover**	**Occurrence likelihood**	
				DEIR	**Database records, Site visits**
American barn owl	*Tyto furcata*	BOP, CSD2			Very close
Western screech-owl	*Megascops kennicotti*	BOP			Nearby
Great-horned owl	*Bubo virginianus*	BOP			Very close
Burrowing owl	*Athene cunicularia*	CCE, BCC, SSC2, BOP, CSD1	Yes	Low	In region
Long-eared owl	*Asio otus*	BCC, BOP, SSC3, CSD1			In region
Short-eared owl	*Asia flammeus*	BCC, SSC3, BOP, CSD2			In region
Lewis's woodpecker	*Melanerpes lewis*	BCC, CSD1			Nearby
Nuttall's woodpecker	*Picoides nuttallii*	BCC			Very close
American kestrel	*Falco sparverius*	BOP			Very close
Merlin	*Falco columbarius*	WL, BOP, CSD2			Very close
Peregrine falcon	*Falco peregrinus*	BOP, CSD1			Nearby
Prairie falcon	Falco mexicanus	WL, BOP, CSD1			Nearby
Olive-sided flycatcher	*Contopus cooperi*	BCC, SSC2, CSD2			Nearby
Willow flycatcher	*Empidonax traillii*	CE			Nearby
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE, CE	Yes	Not expected	In region
Vermilion flycatcher	*Pyrocephalus rubinus*	SSC2, CSD1			Nearby
Least Bell's vireo	*Vireo belli pusillus*	FE, CE, CSD1	Yes	Not expected	Very close
Loggerhead shrike	*Lanius ludovicianus*	SSC2, CSD1			Nearby
Oak titmouse	*Baeolophus inornatus*	BCC			Very close
California horned lark	*Eremophila alpestris actia*	WL, CSD2			Very close
Bank swallow	*Riparia riparia*	CT, CSD1			Very close
Purple martin	*Progne subis*	SSC2, CSD1			Nearby
Wrentit	*Chamaea fasciata*	BCC			Very close
California gnatcatcher	*Polioptila c. californica*	FT, SSC2, CSD1	Yes	Low	Very close
Clark's marsh wren	*Cistothorus palustris clarkae*	SSC2			In range

Common name	***Species name***	**Status[1]**	**MSCP cover**	**Occurrence likelihood**	
				DEIR	**Database records, Site visits**
San Diego cactus wren	*Campylorhynchs brunneicapillus sandiegensis*	SSC1, CSD1	Yes	Not expected	In range
California thrasher	*Toxostoma redivivum*	BCC			Very close
Western bluebird	*Sialia mexicana*	CSD2			Very close
Cassin's finch	*Haemorhous cassinii*	BCC			Nearby
Lawrence's goldfinch	*Spinus lawrencei*	BCC			Very close
Grasshopper sparrow	*Ammodramus savannarum*	SSC2, CSD1	Yes		Very close
Black-chinned sparrow	*Spizella atrogularis*	BCC			Nearby
Bell's sparrow	*Amphispiza b. belli*	WL, CSD1	Yes	Low	Nearby
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SSC2			In range
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	CE, BCC, CSD1			In region
Large-billed savannah sparrow	*Passerculus sandwichensis rostratus*	SSC2, CSD2			In region
Southern California rufous-crowned sparrow	*Aimophila ruficeps canescens*	WL, CSD1	Yes	Low	Very close
Yellow-breasted chat	*Icteria virens*	SSC3, CSD1	Yes		Very close
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC3			Nearby
Bullock's oriole	*Icterus bullockii*	BCC			Very close
Tricolored blackbird	*Agelaius tricolor*	CT, BCC, SSC1, CSD1	Yes		Nearby
Lucy's warbler	*Leiothlypis luciae*	SSC3, CSD1			In region
Virginia's warbler	*Leiothlypis virginiae*	WL, BCC			In region
Yellow warbler	*Setophaga petechia*	SSC2, CSD2			**On site**
Summer tanager	*Piranga rubra*	SSC1, CSD2			Very close
Pallid bat	*Antrozous pallidus*	SSC, WBWG H, CSD2	Yes	Not expected to roost	In region
Townsend's big-eared bat	*Corynorhinus townsendii*	SSC, WBWG:H, CSD2	Yes		In region
Spotted bat	*Euderma maculatum*	SSC, WBWG H, CSD2			In region
California leaf nosed bat	*Macrotus californicus*	SSC, WBWG H, CSD2			In range

Common name	***Species name***	**Status[1]**	**MSCP cover**	**Occurrence likelihood**	
				DEIR	**Database records, Site visits**
Western red bat	*Lasiurus blossevillii*	SSC, WBWG H, CSD2			In region
Hoary bat	*Lasiurus cinereus*	WBWG M			In region
Western yellow bat	*Lasiurus xanthinus*	SSC, WBWG H			In region
Small-footed myotis	*Myotis cililabrum*	WBWG M, CSD2			In region
Long-eared myotis	*Myotis evotis*	WBWG M, CSD2			In region
Fringed myotis	*Myotis thysanodes*	WBWG H, CSD2			In region
Long-legged myotis	*Myotis volans*	WBWG H, CSD2			In region
Yuma myotis	Myotis yumanensis	WBWG LM, CSD2			In region
Western mastiff bat	*Eumops perotis*	SSC, WBWG H, CSD2		Not expected	In region
Pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC, WBWG M, CSD2			In region
Big free-tailed bat	*Nyctinomops macrotis*	SSC, WBWG MH, CSD2			In region
American badger	*Taxidea taxus*	SSC, CSD2	Yes	Not expected	In region
Stephens' kangaroo rat	*Dipodomys stephensi*	FE, CT, CSD1	Yes	Low	In region
Dulzura pocket mouse	*Chaetodipus californicus femoralis*	SSC, CSD2		Low	In range
Northwestern San Diego pocket mouse	*Chaetodipus fallax fallax*	SSC, CSD2		Low	Nearby
Pallid San Diego pocket mouse	*Chaetodipus fallax pallidus*	SSC, CSD2			In range
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	SSC, CSD2			In range
Southern grasshopper mouse	*Onychomys torridus ramona*	SSC			In range
Pacific pocket mouse	*Perognathus longimembris pacificus*	FE, SSC, CSD1		Low	In range
San Diego Bryant's woodrat	*Neotoma lepida intermedia*	SSC, CSD2		Not expected	In region
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	SSC, CSD2	Yes	Low	In region

[1] Listed on Special Animals List (https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406) as FT or FE = federal threatened or endangered, FC = federal candidate for listing, CCT or CCE = Candidate California threatened or endangered, CFP = California Fully Protected (California Fish and Game Code 3511), SSC = California Species of Special Concern, CT or CE = California threatened or endangered, SSC = California Species of Special Concern (not threatened with extinction, but rare, very restricted in range, declining throughout range, peripheral portion of species' range, associated with habitat that is declining in extent, and SSC1, SSC2 and SSC3 = California Bird Species of Special Concern priorities 1, 2 and 3, respectively), WL = Taxa to Watch List, and WBWG = Western Bat Working Group with priority rankings, of low (L), moderate (M), and high (H); listed by U.S. Fish and Wildlife Service (https://www.fws.gov/sites/default/files/documents/birds-of-conservation-concern-2021.pdf) as BCC = Bird of Conservation Concern; as protected as BOP = Birds of Prey (California Fish and Game Code 3503.5, see https://wildlife.ca.gov/Conservation/Birds/Raptors), and as CSD1 and CSD2 = Group 1 and Group 2 species on County of San Diego Sensitive Animal List (County of San Diego 2010).

BIOLOGICAL IMPACTS ASSESSMENT

Whether the impacts analysis is made by the lead agency or by an expert such as myself, the analysis involves prediction. Predictions are necessary because measuring the impacts directly could not happen until after the impacts occur, and this type of measurement would prevent the formulations of avoidance and minimization mitigation strategies that are prioritized by the CEQA. Impact predictions are needed in the environmental review. The accuracy of the predictions of impacts and their significance ultimately relies on the degree of accuracy in the characterization of the existing environmental setting (Figure 3).

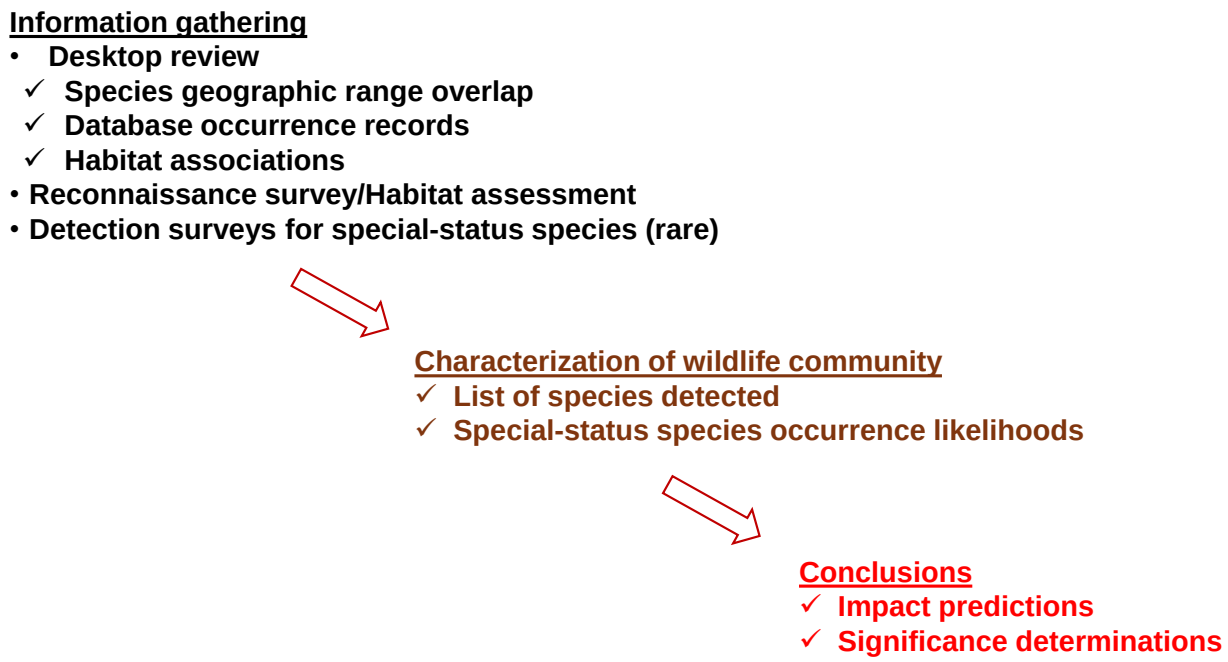


Figure 3. *General flow of information from the gathering stage through the characterization of the existing environment to predictions of impacts and their significance.*

Impact predictions can derive from speculation or from some level of experience (Figure 4). Speculation is repeatedly discouraged in the CEQA Guidelines, and for good reason because prediction accuracy improves with experience. But there are also different types of experience that can be brought to bear on impact predictions, ranging from anecdotes to careful use of scientific inference. Any type of experience is usually better than relying on speculation, but careful scientific inference, especially inference drawn from mensurative (unmanipulated observations of naturally replicated and interspersed treatments) or manipulative experiments, have proven most effective. An analogy would be predicting the boiling temperature of water at a certain place with a known atmospheric pressure after having measured it hundreds of times at other places under various atmospheric pressures. The experience of measuring the boiling temperature at all these other places would certainly result in a more accurate prediction at the certain place as compared to a speculative prediction. We know that use of inference in this

example is certainly more predictive, and not potentially more predictive, because we have a long successful history with the application of this type of experimentation to draw predictive inference.

In the following, I analyze several types of impacts likely to result from the project, none of which is adequately analyzed in the DEIR/FEIR. The DEIR/FEIR do not predict impacts to the productive capacity of wildlife resulting from habitat loss, nor do they predict impacts to wildlife caused by project-generated traffic. The DEIR's analyses of impacts caused by interference with wildlife movement and cumulative effects are merely speculative, as they in no way draw from experience at other similar projects.

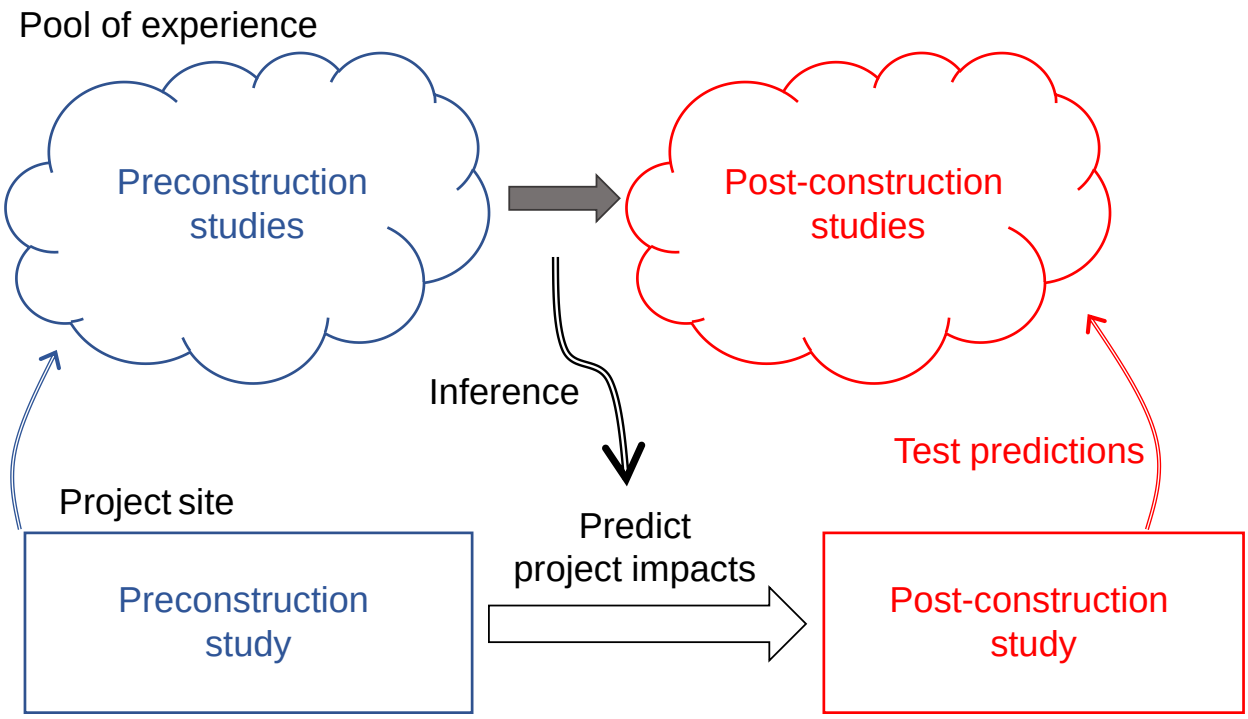


Figure 4. *The ideal framework for arriving at predicted project impacts based on experience with other project sites.*[1] *Ideally, there is a pool of similar projects in similar circumstances where predicted impacts were compared to realized impacts, and into which the proposed project can also contribute to experience. In the reality of review under CEQA, impact predictions are rarely if ever tested, and they rarely if ever contribute to impact predictions for the proposed project.*

[1] The CEQA does not require any sort of scientific framework for testing impact predictions and for drawing inference from the predictions and realizations of impacts at other similar projects. This CEQA shortfall has debilitated expert testimony since CEQA's beginning, but only because lead agencies have not themselves required a scientific approach, and because environmental consultants have not insisted on using one. Every project that goes forward but fails to contribute to the pool of experience of predictions and their validations misses the opportunity to improve both the disclosures of potential impacts and the efficacy of mitigation strategies.

REDUCED PRODUCTIVE CAPACITY FROM HABITAT LOSS

The DEIR/FEIR do not attempt to estimate the numerical or productive capacities of the site for nesting birds. The site is proven to serve as habitat to at least 30 species of wildlife which Dudek and Noriko observed on the site, but the number of avian nest sites remains unknown. Because Noriko's survey was only a reconnaissance survey and therefore unsuitable for detecting all bird nests on the site, estimating total nest density of birds was not possible. Fortunately, we have performed such surveys at other sites to estimate total nest density.

As part of an ongoing study, Noriko Smallwood estimated 1.63 nests/acre on a 1.23-acre site of sage scrub in Murrieta, California in 2023. This density applied to the 2.44 acres of the project site would predict 4 nest sites per year. Assuming 1.39 broods per nest site based on a review of 322 North American bird species, which averaged 1.39 broods per year, then I estimate an average 5.6 nest attempts per year at the project site. Assuming Young's (1948) study site typifies bird productivity of 2.9 fledged birds per nest attempt, then I predict 16.2 fledglings/year at the project site.

The loss of 4 nest sites and 5.6 nest attempts and 16.2 fledglings per year would qualify as significant impacts that have not been analyzed in the DEIR/FEIR. But the impacts would not end with the immediate loss of nest sites. Assuming an average bird generation time of 4 years, the lost capacity of both breeders and annual fledgling production can be estimated from an equation in Smallwood (2022): {(nests/year × chicks/nest × number of years) + (2 adults/nest × nests/year) × (number of years ÷ years/generation)} ÷ (number of years) = 18.2 birds per year denied to California.

The loss of 18.2 birds per year would be a loss of considerable productive capacity that is currently provided by the project site. Most if not all these birds are protected by the federal Migratory Bird Treaty Act and by California's Migratory Bird Protection Act, both of which most strongly protect breeding migratory birds. Therefore, the EIR should be revised to appropriately analyze project impacts to birds in the form of lost productive capacity caused by habitat loss.

INTERFERENCE WITH WILDLIFE MOVEMENT

One of CEQA's principal concerns regarding potential project impacts is whether a proposed project would interfere with wildlife movement in the region. Unfortunately, the DEIR/FEIR provides no serious analysis of the potential for the project to interfere with wildlife movement in the region. The DEIR/FEIR argues that because it is surrounded by development and it is fenced, wildlife cannot move across it. This argument is ridiculous because the species detected on the site could not have arrived at the site without having negotiated the developed landscape and the fence.

There has been no program of observation to characterize how wildlife use the site for movement in the region. Given this lack of diligence to the CEQA review process, the City merely speculates that developments and fences preclude wildlife movement – movement that has obviously occurred and undoubtedly continues to occur.

The EIR should be revised to appropriately analyze the project's potential impacts to volant wildlife and how those impacts to movement can be mitigated.

BIRD-WINDOW COLLISIONS

The project would add 165 residential units and 5,600 square-feet of commercial space within a 74-foot-tall building to open space that is currently habitat to birds. The new building would present glass windows to birds attempting to use an essential portion of their habitat – that portion of the gaseous atmosphere that is referred to as the aerosphere (Davy et al. 2017, Diehl et al. 2017). The aerosphere is where birds and bats and other volant animals with wings migrate, disperse, forage, perform courtship and where some of them mate. Birds are some of the many types of animals that evolved wings as a morphological adaptation to thrive by moving through the medium of the aerosphere. The aerosphere is habitat, to which an entire discipline of ecology has emerged to study this essential aspect of habitat – the discipline of aeroecology (Kunz et al. 2008).

Many special-status species of birds have been recorded at or near the aerosphere of the project site. My database review and Noriko's and Yorke's (2023) site visits indicate there are 90 special-status species of birds with potential to use the site's aerosphere (Table 2). All of the birds represented in Table 2 can quickly fly from wherever they have been documented to the project site, so they would all be within brief flights to the proposed project's windows.

Window collisions are often characterized as either the second or third largest source or human-caused bird mortality. The numbers behind these characterizations are often attributed to Klem's (1990) and Dunn's (1993) estimates of about 100 million to 1 billion bird fatalities in the USA, or more recently by Loss et al.'s (2014) estimate of 365-988 million bird fatalities in the USA or Calvert et al.'s (2013) and Machtans et al.'s (2013) estimates of 22.4 million and 25 million bird fatalities in Canada, respectively. The proposed project would impose windows in the airspace normally used by birds.

Glass-façades of buildings intercept and kill many birds, but are differentially hazardous to birds based on spatial extent, contiguity, orientation, and other factors. At Washington State University, Johnson and Hudson (1976) found 266 bird fatalities of 41 species within 73 months of monitoring of a three-story glass walkway (no fatality adjustments attempted). Prior to marking the windows to warn birds of the collision hazard, the collision rate was 84.7 per year. At that rate, and not attempting to adjust the fatality estimate for the proportion of fatalities not found, 4,574 birds were likely killed over the 54 years since the start of their study, and that's at a relatively small building façade. Accounting for the proportion of fatalities not found, the number of birds killed by this walkway over the last 54 years would have been about 14,270. And this is just for one 3-story, glass-sided walkway between two college campus buildings.

Klem's (1990) estimate was based on speculation that 1 to 10 birds are killed per building per year, and this speculated range was extended to the number of buildings

estimated by the US Census Bureau in 1986. Klem's speculation was supported by fatality monitoring at only two houses, one in Illinois and the other in New York. Also, the basis of his fatality rate extension has changed greatly since 1986. Whereas his estimate served the need to alert the public of the possible magnitude of the bird-window collision issue, it was highly uncertain at the time and undoubtedly outdated more than three decades hence. Indeed, by 2010 Klem (2010) characterized the upper end of his estimated range – 1 billion bird fatalities – as conservative. Furthermore, the estimate lumped species together as if all birds are the same and the loss of all birds to windows has the same level of impact.

By the time Loss et al. (2014) performed their effort to estimate annual USA bird-window fatalities, many more fatality monitoring studies had been reported or were underway. Loss et al. (2014) incorporated many more fatality rates based on scientific monitoring, and they were more careful about which fatality rates to include. However, they included estimates based on fatality monitoring by homeowners, which in one study were found to detect only 38% of the available window fatalities (Bracey et al. 2016). Loss et al. (2014) excluded all fatality records lacking a dead bird in hand, such as injured birds or feather or blood spots on windows. Loss et al.'s (2014) fatality metric was the number of fatalities per building (where in this context a building can include a house, low-rise, or high-rise structure), but they assumed that this metric was based on window collisions. Because most of the bird-window collision studies were limited to migration seasons, Loss et al. (2014) developed an admittedly assumption-laden correction factor for making annual estimates. Also, only 2 of the studies included adjustments for carcass persistence and searcher detection error, and it was unclear how and to what degree fatality rates were adjusted for these factors. Although Loss et al. (2014) attempted to account for some biases as well as for large sources of uncertainty mostly resulting from an opportunistic rather than systematic sampling data source, their estimated annual fatality rate across the USA was highly uncertain and vulnerable to multiple biases, most of which would have resulted in fatality estimates biased low.

In my review of bird-window collision monitoring, I found that the search radius around homes and buildings was very narrow, usually 2 meters. Based on my experience with bird collisions in other contexts, I would expect that a large portion of bird-window collision victims would end up farther than 2 m from the windows, especially when the windows are higher up on tall buildings. In my experience, searcher detection rates tend to be low for small birds deposited on ground with vegetation cover or woodchips or other types of organic matter. Also, vertebrate scavengers entrain on anthropogenic sources of mortality and quickly remove many of the carcasses, thereby preventing the fatality searcher from detecting these fatalities. Adjusting fatality rates for these factors – search radius bias, searcher detection error, and carcass persistence rates – would greatly increase nationwide estimates of bird-window collision fatalities.

Buildings can intercept many nocturnal migrants as well as birds flying in daylight. As mentioned above, Johnson and Hudson (1976) found 266 bird fatalities of 41 species within 73 months of monitoring of a four-story glass walkway at Washington State University (no adjustments attempted for undetected fatalities). Somerlot (2003) found 21 bird fatalities among 13 buildings on a university campus within only 61 days.

Monitoring twice per week, Hager at al. (2008) found 215 bird fatalities of 48 species, or 55 birds/building/year, and at another site they found 142 bird fatalities of 37 species for 24 birds/building/year. Gelb and Delacretaz (2009) recorded 5,400 bird fatalities under buildings in New York City, based on a decade of monitoring only during migration periods, and some of the high-rises were associated with hundreds of fatalities each. Klem et al. (2009) monitored 73 building façades in New York City during 114 days of two migratory periods, tallying 549 collision victims, nearly 5 birds per day. Borden et al. (2010) surveyed a 1.8 km route 3 times per week during 12-month period and found 271 bird fatalities of 50 species. Parkins et al. (2015) found 35 bird fatalities of 16 species within only 45 days of monitoring under 4 building façades. From 24 days of survey over a 48-day span, Porter and Huang (2015) found 47 fatalities under 8 buildings on a university campus. Sabo et al. (2016) found 27 bird fatalities over 61 days of searches under 31 windows. In San Francisco, Kahle et al. (2016) found 355 collision victims within 1,762 days under a 5-story building. Ocampo-Peñuela et al. (2016) searched the perimeters of 6 buildings on a university campus, finding 86 fatalities after 63 days of surveys. One of these buildings produced 61 of the 86 fatalities, and another building with collision-deterrent glass caused only 2 of the fatalities, thereby indicating a wide range in impacts likely influenced by various factors. There is ample evidence available to support my prediction that the proposed project would result in many collision fatalities of birds.

Project Impact Prediction

By the time of these comments, I had reviewed and processed results of bird collision monitoring at 213 buildings and façades for which bird collisions per m^2 of glass per year could be calculated and averaged (Johnson and Hudson 1976, O'Connell 2001, Somerlot 2003, Hager et al. 2008, Borden et al. 2010, Hager et al. 2013, Porter and Huang 2015, Parkins et al. 2015, Kahle et al. 2016, Ocampo-Peñuela et al. 2016, Sabo et al. 2016, Barton et al. 2017, Gomez-Moreno et al. 2018, Schneider et al. 2018, Loss et al. 2019, Brown et al. 2020, City of Portland Bureau of Environmental Services and Portland Audubon 2020, Riding et al. 2020). These study results averaged 0.073 bird deaths per m^2 of glass per year (95% CI: 0.042-0.102). This average and its 95% confidence interval provide a robust basis for predicting fatality rates at a proposed new project.

The DEIR does not report the extent of windows on the building, but it does provide renderings of the proposed building. I therefore measured window dimensions from the renderings. According to the renderings, there would be 946 m^2 of glass windows. Based on this area of external glass, I predict annual bird deaths of 69 (95% CI: 41–97).

The vast majority of these predicted deaths would be of birds protected under the Migratory Bird Treaty Act and under the California Migratory Bird Protection Act, thus causing significant unmitigated impacts. Given the predicted level of bird-window collision mortality, and the lack of any proposed mitigation, it is my opinion that the proposed project would result in potentially significant adverse biological impacts, including the unmitigated take of both terrestrial and aerial habitat of birds and other sensitive species. Not only would the project take habitat of rare and sensitive species of

birds, but it would transform the building's airspace into a lethal collision trap to birds. The EIR should be revised to appropriately analyze the potential impacts of bird-window collision mortality, and to formulate appropriate mitigation measures.

TRAFFIC IMPACTS TO WILDLIFE

The DEIR neglects to address one of the project's most obvious, substantial impacts to wildlife, and that is wildlife mortality and injuries caused by project-generated traffic. Project-generated traffic would endanger wildlife that must, for various reasons, cross roads used by the project's traffic (Photos 20—23), including along roads far from the project footprint but which would nevertheless by traversed by automobiles head to or from the project's building. Vehicle collisions have accounted for the deaths of many thousands of amphibian, reptile, mammal, bird, and arthropod fauna, and the impacts have often been found to be significant at the population level (Forman et al. 2003). Across North America traffic impacts have taken devastating tolls on wildlife (Forman et al. 2003). In Canada, 3,562 birds were estimated killed per 100 km of road per year (Bishop and Brogan 2013), and the US estimate of avian mortality on roads is 2,200 to 8,405 deaths per 100 km per year, or 89 million to 340 million total per year (Loss et al. 2014). Local impacts can be more intense than nationally.

Photo 20. *A white-tailed antelope squirrel runs across the road just in the Coachella Valley, 26 May 2022. Such road crossings are usually successful, but too often prove fatal to the animal.*

Photo 21. *A coyote uses the crosswalk to cross a road on 2 February 2023. Not all drivers stop, nor do all animals use the crosswalk. Too often, animals are injured or killed when they attempt to cross roads.*

Photos 22 and 23. *Raccoon killed on Road 31 just east of Highway 505 in Solano County (left; photo taken on 10 November 2018), and mourning dove killed by vehicle on a California road (right; photo by Noriko Smallwood, 21 June 2020.)*

The nearest study of traffic-caused wildlife mortality was performed along a 2.5-mile stretch of Vasco Road in Contra Costa County, California. Fatality searches in this study found 1,275 carcasses of 49 species of mammals, birds, amphibians and reptiles over 15 months of searches (Mendelsohn et al. 2009). This fatality number needs to be adjusted for the proportion of fatalities that were not found due to scavenger removal and searcher error. This adjustment is typically made by placing carcasses for searchers to find (or not find) during their routine periodic fatality searches. This step was not taken at Vasco Road (Mendelsohn et al. 2009), but it was taken as part of another study next to Vasco Road (Brown et al. 2016). Brown et al.'s (2016) adjustment factors for carcass persistence resembled those of Santos et al. (2011). Also applying searcher detection rates from Brown et al. (2016), the adjusted total number of fatalities was estimated at 9,462 animals killed by traffic on the road. This fatality number projected over 1.25 years and 2.5 miles of road translates to 3,028 wild animals per mile per year. In terms comparable to the national estimates, the estimates from the Mendelsohn et al. (2009) study would translate to 188,191 animals killed per 100 km of road per year, or 22 times that of Loss et al.'s (2014) upper bound estimate and 53 times the Canadian estimate. An analysis is needed of whether increased traffic generated by the project site would similarly result in local impacts on wildlife.

For wildlife vulnerable to front-end collisions and crushing under tires, road mortality can be predicted from the study of Mendelsohn et al. (2009) as a basis, although it would be helpful to have the availability of more studies like that of Mendelsohn et al. (2009) at additional locations. My analysis of the Mendelsohn et al. (2009) data resulted in an estimated 3,028 animals killed per mile along a county road in Contra Costa County. The estimated numbers of fatalities were 1.75% birds, 26.4% mammals (many mice and pocket mice, but also ground squirrels, desert cottontails, striped skunks, American badgers, raccoons, and others), 67.4% amphibians (large numbers of California tiger salamanders and California red-legged frogs, but also Sierran treefrogs,

western toads, arboreal salamanders, slender salamanders and others), and 4.4% reptiles (many western fence lizards, but also skinks, alligator lizards, and snakes of various species). VMT is useful for predicting wildlife mortality because I was able to quantify miles traveled along the studied reach of Vasco Road during the time period of the Mendelsohn et al. (2009), hence enabling a rate of fatalities per VMT that can be projected to other sites, assuming similar collision fatality rates.

Predicting project-generated traffic impacts to wildlife

The DEIR does not report a prediction of annual VMT that would be generated by the project. However, it does predict 12.5 daily VMT/capita for 512 residents, and 24.8 daily VMT/employee for 6 employees, which applied to one year would predict 2,390,312 annual VMT. During the Mendelsohn et al. (2009) study, 19,500 cars traveled Vasco Road daily, so the vehicle miles that contributed to my estimate of non-volant fatalities was 19,500 cars and trucks × 2.5 miles × 365 days/year × 1.25 years = 22,242,187.5 vehicle miles per 9,462 wildlife fatalities, or 2,351 vehicle miles per fatality. This rate divided into the predicted annual VMT would predict 1,017 vertebrate wildlife fatalities per year due to project-generated traffic. However, the area around the project is more urbanized than was the Vasco Road study site, so based on my own ongoing study of wildlife mortality on roads in an urban setting, I would half this mortality, or about 508 wildlife fatalities per year caused by project-generated traffic.

Based on my analysis, the project-generated traffic would cause substantial, significant impacts to wildlife. The DEIR/FEIR does not address this potential impact, let alone propose to mitigate it. Mitigation measures to improve wildlife safety along roads are available and are feasible, and they need exploration for their suitability with the proposed project. Given the predicted level of project-generated traffic-caused mortality, and the lack of any proposed mitigation, it is my opinion that the proposed project would result in potentially significant adverse biological impacts.

The EIR needs to be revised to appropriately analyze the impact of wildlife collision mortality resulting from project-generated traffic.

CUMULATIVE IMPACTS

The cumulative impacts analysis is fundamentally flawed. According to the DEIR, the mitigation for the project's direct impacts would preclude the need for mitigation for potential cumulative impacts. The DEIR contrives the false standard that a given impact is cumulatively considerable only when it is a significant project-level direct impact that has not been fully mitigated, hence leaving no residual impact. The DEIR implies that cumulative impacts are really residual impacts left over by inadequate mitigation of project impacts. This notion of residual impacts being the source of cumulative impacts is inconsistent with CEQA's definition of cumulative effects. Individually mitigated projects do not negate the significance of cumulative impacts. If they did, then CEQA would not require a cumulative effects analysis. To summarize, the DEIR presents no cumulative effects analysis as defined in two ways by CEQA.

In collaboration with Noriko Smallwood, I measured the impacts – inclusive of cumulative impacts – of wildlife habitat loss caused by mitigated development projects. We revisited 80 sites of proposed projects that we had originally surveyed in support of comments on CEQA review documents (Smallwood and Smallwood 2023). We revisited the sites to repeat the survey methods at the same time of year, the same start time in the day, and the same methods and survey duration in order to measure the effects of mitigated development on wildlife. We structured the experiment in a before-after, control-impact experimental design, as some of the sites had been developed since our initial survey and some had remained undeveloped. We found that mitigated development resulted in a 66% loss of species on site, and 48% loss of species in the project area. Counts of vertebrate animals declined 90%. "Development impacts measured by the mean number of species detected per survey were greatest for amphibians (-100%), followed by mammals (-86%), grassland birds (-75%), raptors (-53%), special-status species (-49%), all birds as a group (-48%), non-native birds (-44%), and synanthropic birds (-28%). Our results indicated that urban development substantially reduced vertebrate species richness and numerical abundance, even after richness and abundance had likely already been depleted by the cumulative effects of loss, fragmentation, and degradation of habitat in the urbanizing environment," and despite all the mitigation measures per existing policies and regulations. We also specifically tested for the cumulative effects of projects on wildlife in neighboring habitats, and found significant decreases in species richness and overall abundance in those areas as well. The proposed project would cause the same declines in wildlife abundance and species richness, and based on what I see in the DEIR, these would qualify as significant unmitigated cumulative impacts.

MITIGATION MEASURES

Before I comment specifically on the mitigation strategy, I will repeat that the formulation of appropriate mitigation can only follow an adequate survey effort for wildlife on and around the project site. The characterizations of the plant and wildlife communities need to be sufficiently accurate to accurately characterize the existing environmental setting. This accuracy is needed to formulate the appropriate mitigation strategy.

MM-BIO-1a Breeding Season Avoidance. The removal of coastal sage scrub from the Project impact footprint shall only occur from September 1 through February 14 to avoid the bird breeding season. Further, to the maximum extent practicable, grading activities associated with construction of the Project shall occur September 1 through February 14 to avoid the breeding season. If Project construction must occur during the breeding season, MM-BIO-1b shall be implemented.

This requirement is not a requirement at all, but rather a condition for implementing MM BIO-1b. Moreover, its implementation would not prevent the permanent loss of avian productive capacity I predict in my letter herein.

MM-BIO-1b Nesting Survey(s). Take of birds protected under the Migratory Bird Treaty Act and California Fish and Game Code shall be avoided during the nesting season. To avoid any direct impacts on raptors and/or any migratory birds protected under the Migratory Bird Treaty Act and California Fish and Game Code, removal of habitat that supports active nests on the proposed area of disturbance shall occur outside of the nesting season for these species (February 15 through August 31, annually). If construction occurs during the nesting season, pre-construction nesting bird surveys must be conducted within 72 hours of construction-related activities. If nesting birds are detected by the biologist, the following buffers shall be established: (1) no work within 300 feet of a non-listed nesting migratory bird nest, and (2) no work within 500 feet of a listed bird or raptor nest. However, the biologist may reduce these buffer widths depending on site-specific conditions (e.g., the width and type of screening vegetation between the nest and proposed activity) or the existing ambient level of activity (e.g., existing level of human activity within the buffer distance) in conjunction with consultation with the City of San Marcos. If construction must take place within the recommended buffer widths above, the Project applicant shall contact the City of San Marcos and wildlife agencies to determine the appropriate buffer.

If the project goes forward, I would concur with the need for preconstruction surveys. However, the measure as written for birds poses several shortfalls that would render it largely ineffective. First, the avian breeding season recognized by the CDFW is 1 February through 15 September. The DEIR should be revised accordingly.

Second, a preconstruction survey by a single biologist within 72 hours of the start of construction would not realistically detect all the nest sites on the project site. Preconstruction, take-avoidance surveys consist of two steps, both of which are very difficult. First, the biologist(s) performing the survey must identify birds that are breeding. Second, the biologist(s) must locate the breeding birds' nests. The first step is typically completed by observing bird behaviors such as food deliveries and nest territory defense. These types of observations typically require many surveys on many dates spread throughout the breeding season even for a single species. To identify and locate the birds of all species nesting on a site requires a much greater survey effort.

Third, even assuming all the nests could be found, the mitigation measure would apply only to the breeding season of the survey. After the survey year of the preconstruction survey, California would be denied the production of birds from the project site during every subsequent year. The impacts of the project to birds would be permanent and of large magnitude (see my prediction, above, of the lost productive capacity of breeding birds).

Finally, the mitigation language allows a single individual to make a subjective decision, outside the public's view, to determine the buffer area for any given species and the particular circumstances. Furthermore, there is no evidence provided or cited that the proposed buffers have been effective anywhere. This measure lacks objective criteria or established criteria, and it is unenforceable.

Regarding the FEIR's requirement for a Crotch's bumble bee preconstruction survey, the requirement treats what is supposed to be a detection survey (otherwise referred to as a focused survey) as a preconstruction survey, but detection surveys are not preconstruction surveys. Moreover, a detection survey is performed for the purpose of disclosing information to the public and decision-makers. I agree with CDFW's comments that detection surveys are needed, but I disagree with CDFW's characterization of this type of survey as a mitigation measure. As written, the measure bypasses timely, meaningful disclosure regarding the existence of Crotch's bumble bee. The EIR needs to be withdrawn so that it can be updated with the results of a completed set of detection surveys.

MM-BIO-2a Construction Best Management Practices. The Project applicant shall ensure that the following conditions are implemented during Project construction to minimize potential environmental impacts due to project implementation:
1. Impacts from fugitive dust shall be avoided and minimized through watering and other appropriate measures consistent with the Construction General Permit Order 2009-009-DWQ.
2. Employees shall strictly limit their activities, vehicles, equipment, and construction materials to the Project site.
3. To avoid attracting predators, the Project site shall be kept clean of debris. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site.
4. Pets of Project personnel shall not be allowed on the Project site.

The required practices should be implemented should the project go forward, but BMPs 1 and 2 would be implemented for reasons having nothing to do with minimizing harm to wildlife. BMPs 3 and 4 would bring trivial benefits to wildlife relative to the impacts. On the whole, the BMPs would achieve little if any conservation benefit in the face of the impacts.

MM-BIO-2b Landscaping. The applicant shall ensure that development landscaping habitat does not include exotic plant species that may be invasive to native habitats in the region. Exotic plant species not to be used include any species listed on the California Invasive Plant Council's (Cal-IPC) "Invasive Plant Inventory" List. In addition, landscaping should not use plants that require intensive irrigation, fertilizers, or pesticides.

Relative to project impacts, this is another measure empty of meaningful conservation benefits. The project would not be located adjacent to wildlife habitat, as the Diegan coastal sage scrub and annual grassland of the site is the only remaining natural vegetation cover in the area. Therefore, invasive plants that might expand into natural vegetation cover is not an issue.

MM-BIO-2c Biological Monitor Requirements and Duties. A qualified biologist shall be on site per the discretion of the City during initial clearing/grubbing and during grading to ensure compliance with all Project-imposed mitigation measures. The biologist shall be available during pre-construction and construction phases to review

grading plans, address protection of potential biological resources, monitor ongoing work, and maintain communications with the Project's engineer to ensure that any issues are appropriately and lawfully managed.

The qualified biological monitor shall also be responsible for the following duties:

1. Periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust.

2. Halt work, if necessary, and confer with the U.S. Fish and Wildlife Service (USFWS) and City of San Marcos (City) to ensure the proper implementation of species and habitat protection measures. The biologist shall report any violation to USFWS and the City within 24 hours of its occurrence.

3. Submit a final report to the City within 60 days of Project completion that includes the following: (1) as-built construction drawings for grading with an overlay of any active nests; (2) photographs of habitat areas during pre-construction and post-construction conditions; and (3) other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with the avoidance/minimization provisions were achieved.

Should the project go forward, a biological monitor should be onsite as required in the measure. However, the monitor should also report all instances of wildlife mortality and injury resulting from construction activities. It should also be understood that this measure would do nothing to avoid or minimize the impacts I predict in my letter herein.

MM-BIO-3 Off-Site Mitigation. Impacts to sensitive vegetation shall be mitigated through the purchase of 2.13 acres of Diegan coastal sage scrub and 0.06 acres of non-native grassland from a County approved mitigation bank. The amount of mitigation acreage required for non-native grassland may be reduced if up-tiered (i.e., coastal sage scrub) habitat is available for purchase. If mitigation credits are not available for purchase, an alternative may be designation of an off-site preserve.

[check the mitigation ratio of the MSCP] Critical details are missing from this measure, such as whether and where Diegan coastal sage scrub and annual grassland habitat is available for purchase, and to what degree the purchase of annual grassland habitat could be up-tiered to coastal sage scrub.

I agree with CDFW that the proposed habitat mitigation ratio is deficient. To avoid a net loss of habitat, the mitigation ratio should be 3:1 rather than 1:1. CDFW recommends ratios of 2:1 for Diegan coastal sage scrub and 1:1 for annual grassland, but I suggest a higher ratio for coastal sage scrub because the habitat fragmentation of this vegetation community has been rapid and severe.

RECOMMENDED MEASURES

Road Mortality: Compensatory mitigation is needed for the increased wildlife mortality that would be caused by bird-window collisions and the project-generated road traffic in the region. I suggest that this mitigation can be directed toward funding research to identify fatality patterns and effective impact reduction measures such as reduced speed limits and wildlife under-crossings or overcrossings of particularly dangerous road segments. Compensatory mitigation can also be provided in the form of donations to wildlife rehabilitation facilities (see below).

Fund Wildlife Rehabilitation Facilities: Compensatory mitigation ought also to include funding contributions to wildlife rehabilitation facilities to cover the costs of injured animals that will be delivered to these facilities for care. Many animals would likely be injured by collisions with the building's windows and with automobiles traveling to and from the building.

Landscaping: If the Project goes forward, California native plant landscaping (i.e., grassland and locally appropriate scrub plants) should be considered to be used as opposed to landscaping with lawn and exotic shrubs and trees. Native plants offer more structure, cover, food resources, and nesting substrate for wildlife than landscaping with lawn and ornamental trees. Native plant landscaping has been shown to increase the abundance of arthropods which act as importance sources of food for wildlife and are crucial for pollination and plant reproduction (Narango et al. 2017, Adams et al. 2020, Smallwood and Wood 2022.). Further, many endangered and threated insects require native host plants for reproduction and migration, e.g., monarch butterfly. Around the world, landscaping with native plants over exotic plants increases the abundance and diversity of birds, and is particularly valuable to native birds (Lerman and Warren 2011, Burghardt et al. 2008, Berthon et al. 2021, Smallwood and Wood 2022). Landscaping with native plants is a way to maintain or to bring back some of the natural habitat and lessen the footprint of urbanization by acting as interconnected patches of habitat for wildlife (Goddard et al. 2009, Tallamy 2020). Lastly, not only does native plant landscaping benefit wildlife, it requires less water and maintenance than traditional landscaping with lawn and hedges.

Thank you for your consideration,

Shawn Smallwood, Ph.D.

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Kenneth Shawn Smallwood
Curriculum Vitae

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Born May 3, 1963 in
Sacramento, California.
Married, father of two.

Ecologist

Expertise

- Finding solutions to controversial problems related to wildlife interactions with human industry, infrastructure, and activities;
- Wildlife monitoring and field study using GPS, thermal imaging, behavior surveys;
- Using systems analysis and experimental design principles to identify meaningful ecological patterns that inform management decisions.

Education

Ph.D. Ecology, University of California, Davis. September 1990.
M.S. Ecology, University of California, Davis. June 1987.
B.S. Anthropology, University of California, Davis. June 1985.
Corcoran High School, Corcoran, California. June 1981.

Experience

- 762 professional reports, including:
- 90 peer reviewed publications
- 24 in non-reviewed proceedings
- 646 reports, declarations, posters and book reviews
- 8 in mass media outlets
- 92 public presentations of research results

Editing for scientific journals: Guest Editor, *Wildlife Society Bulletin*, 2012-2013, of invited papers representing international views on the impacts of wind energy on wildlife and how to mitigate the impacts. Associate Editor, *Journal of Wildlife Management*, March 2004 to 30 June 2007. Editorial Board Member, *Environmental Management*, 10/1999 to 8/2004. Associate Editor, *Biological Conservation*, 9/1994 to 9/1995.

Member, Alameda County Scientific Review Committee (SRC), August 2006 to April 2011. The five-member committee investigated causes of bird and bat collisions in the Altamont Pass Wind Resource Area, and recommended mitigation and monitoring measures. The SRC reviewed the science underlying the Alameda County Avian Protection Program, and advised

the County on how to reduce wildlife fatalities.

Consulting Ecologist, 2004-2007, California Energy Commission (CEC). Provided consulting services as needed to the CEC on renewable energy impacts, monitoring and research, and produced several reports. Also collaborated with Lawrence-Livermore National Lab on research to understand and reduce wind turbine impacts on wildlife.

Consulting Ecologist, 1999-2013, U.S. Navy. Performed endangered species surveys, hazardous waste site monitoring, and habitat restoration for the endangered San Joaquin kangaroo rat, California tiger salamander, California red-legged frog, California clapper rail, western burrowing owl, salt marsh harvest mouse, and other species at Naval Air Station Lemoore; Naval Weapons Station, Seal Beach, Detachment Concord; Naval Security Group Activity, Skaggs Island; National Radio Transmitter Facility, Dixon; and, Naval Outlying Landing Field Imperial Beach.

Part-time Lecturer, 1998-2005, California State University, Sacramento. Instructed Mammalogy, Behavioral Ecology, and Ornithology Lab, Contemporary Environmental Issues, Natural Resources Conservation.

Senior Ecologist, 1999-2005, BioResource Consultants. Designed and implemented research and monitoring studies related to avian fatalities at wind turbines, avian electrocutions on electric distribution poles across California, and avian fatalities at transmission lines.

Chairman, Conservation Affairs Committee, The Wildlife Society--Western Section, 1999-2001. Prepared position statements and led efforts directed toward conservation issues, including travel to Washington, D.C. to lobby Congress for more wildlife conservation funding.

Systems Ecologist, 1995-2000, Institute for Sustainable Development. Headed ISD's program on integrated resources management. Developed indicators of ecological integrity for large areas, using remotely sensed data, local community involvement and GIS.

Associate, 1997-1998, Department of Agronomy and Range Science, University of California, Davis. Worked with Shu Geng and Mingua Zhang on several studies related to wildlife interactions with agriculture and patterns of fertilizer and pesticide residues in groundwater across a large landscape.

Lead Scientist, 1996-1999, National Endangered Species Network. Informed academic scientists and environmental activists about emerging issues regarding the Endangered Species Act and other environmental laws. Testified at public hearings on endangered species issues.

Ecologist, 1997-1998, Western Foundation of Vertebrate Zoology. Conducted field research to determine the impact of past mercury mining on the status of California red-legged frogs in Santa Clara County, California.

Senior Systems Ecologist, 1994-1995, EIP Associates, Sacramento, California. Provided consulting services in environmental planning, and quantitative assessment of land units for their conservation and restoration opportunities basedon ecological resource requirements of 29 special-status species. Developed ecological indicators for prioritizing areas within Yolo County

to receive mitigation funds for habitat easements and restoration.

Post-Graduate Researcher, 1990-1994, Department of Agronomy and Range Science, *U.C. Davis*. Under Dr. Shu Geng's mentorship, studied landscape and management effects on temporal and spatial patterns of abundance among pocket gophers and species of Falconiformes and Carnivora in the Sacramento Valley. Managed and analyzed a data base of energy use in California agriculture. Assisted with landscape (GIS) study of groundwater contamination across Tulare County, California.

Work experience in graduate school: Co-taught Conservation Biology with Dr. Christine Schonewald, 1991 & 1993, UC Davis Graduate Group in Ecology; Reader for Dr. Richard Coss's course on Psychobiology in 1990, UC Davis Department of Psychology; Research Assistant to Dr. Walter E. Howard, 1988-1990, UC Davis Department of Wildlife and Fisheries Biology, testing durable baits for pocket gopher management in forest clearcuts; Research Assistant to Dr. Terrell P. Salmon, 1987-1988, UC Wildlife Extension, Department of Wildlife and Fisheries Biology, developing empirical models of mammal and bird invasions in North America, and a rating system for priority research and control of exotic species based on economic, environmental and human health hazards in California. Student Assistant to Dr. E. Lee Fitzhugh, 1985-1987, UC Cooperative Extension, Department of Wildlife and Fisheries Biology, developing and implementing statewide mountain lion track count for long-term monitoring.

Fulbright Research Fellow, Indonesia, 1988. Tested use of new sampling methods for numerical monitoring of Sumatran tiger and six other species of endemic felids, and evaluated methods used by other researchers.

Projects

Repowering wind energy projects through careful siting of new wind turbines using map-based collision hazard models to minimize impacts to volant wildlife. Funded by wind companies (principally NextEra Renewable Energy, Inc.), California Energy Commission and East Bay Regional Park District, I have collaborated with a GIS analyst and managed a crew of five field biologists performing golden eagle behavior surveys and nocturnal surveys on bats and owls. The goal is to quantify flight patterns for development of predictive models to more carefully site new wind turbines in repowering projects. Focused behavior surveys began May 2012 and continue. Collision hazard models have been prepared for seven wind projects, three of which were built. Planning for additional repowering projects is underway.

Test avian safety of new mixer-ejector wind turbine (MEWT). Designed and implemented a before-after, control-impact experimental design to test the avian safety of a new, shrouded wind turbine developed by Ogin Inc. (formerly known as FloDesign Wind Turbine Corporation). Supported by a $718,000 grant from the California Energy Commission's Public Interest Energy Research program and a 20% match share contribution from Ogin, I managed a crew of seven field biologists who performed periodic fatality searches and behavior surveys, carcass detection trials, nocturnal behavior surveys using a thermal camera, and spatial analyses with the collaboration of a GIS analyst. Field work began 1 April 2012 and ended 30 March 2015 without Ogin installing its MEWTs, but we still achieved multiple important scientific advances.

Reduce avian mortality due to wind turbines at Altamont Pass. Studied wildlife impacts caused by 5,400 wind turbines at the world's most notorious wind resource area. Studied how impacts are perceived by monitoring and how they are affected by terrain, wind patterns, food resources, range management practices, wind turbine operations, seasonal patterns, population cycles, infrastructure management such as electric distribution, animal behavior and social interactions.

Reduce avian mortality on electric distribution poles. Directed research toward reducing bird electrocutions on electric distribution poles, 2000-2007. Oversaw 5 founds of fatality searches at 10,000 poles from Orange County to Glenn County, California, and produced two large reports.

Cook *et al*. v. Rockwell International *et al*., No. 90-K-181 (D. Colorado). Provided expert testimony on the role of burrowing animals in affecting the fate of buried and surface-deposited radioactive and hazardous chemical wastes at the Rocky Flats Plant, Colorado. Provided expert reports based on four site visits and an extensive document review of burrowing animals. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals. I testified in federal court in November 2005, and my clients were subsequently awarded a $553,000,000 judgment by a jury. After appeals the award was increased to two billion dollars.

Hanford Nuclear Reservation Litigation. Provided expert testimony on the role of burrowing animals in affecting the fate of buried radioactive wastes at the Hanford Nuclear Reservation, Washington. Provided three expert reports based on three site visits and extensive document review. Predicted and verified a certain population density of pocket gophers on buried waste structures, as well as incidence of radionuclide contamination in body tissue. Conducted transect surveys for evidence of burrowing animals and other wildlife on and around waste facilities. Discovered substantial intrusion of waste structures by burrowing animals.

Expert testimony and declarations on proposed residential and commercial developments, gas-fired power plants, wind, solar and geothermal projects, water transfers and water transfer delivery systems, endangered species recovery plans, Habitat Conservation Plans and Natural Communities Conservation Programs. Testified before multiple government agencies, Tribunals, Boards of Supervisors and City Councils, and participated with press conferences and depositions. Prepared expert witness reports and court declarations, which are summarized under Reports (below).

Protocol-level surveys for special-status species. Used California Department of Fish and Wildlife and US Fish and Wildlife Service protocols to search for California red-legged frog, California tiger salamander, arroyo southwestern toad, blunt-nosed leopard lizard, western pond turtle, giant kangaroo rat, San Joaquin kangaroo rat, San Joaquin kit fox, western burrowing owl, Swainson's hawk, Valley elderberry longhorn beetle and other special-status species.

Conservation of San Joaquin kangaroo rat. Performed research to identify factors responsible for the decline of this endangered species at Lemoore Naval Air Station, 2000-2013, and implemented habitat enhancements designed to reverse the trend and expand the population.

Impact of West Nile Virus on yellow-billed magpies. Funded by Sacramento-Yolo Mosquito and Vector Control District, 2005-2008, compared survey results pre- and post-West Nile Virus epidemic for multiple bird species in the Sacramento Valley, particularly on yellow-billed magpie and American crow due to susceptibility to WNV.

Workshops on HCPs. Assisted Dr. Michael Morrison with organizing and conducting a 2-day workshop on Habitat Conservation Plans, sponsored by Southern California Edison, and another 1-day workshop sponsored by PG&E. These Workshops were attended by academics, attorneys, and consultants with HCP experience. We guest-edited a Proceedings published in Environmental Management.

Mapping of biological resources along Highways 101, 46 and 41. Used GPS and GIS to delineate vegetation complexes and locations of special-status species along 26 miles of highway in San Luis Obispo County, 14 miles of highway and roadway in Monterey County, and in a large area north of Fresno, including within reclaimed gravel mining pits.

GPS mapping and monitoring at restoration sites and at Caltrans mitigation sites. Monitored the success of elderberry shrubs at one location, the success of willows at another location, and the response of wildlife to the succession of vegetation at both sites. Also used GPS to monitor the response of fossorial animals to yellow star-thistle eradication and natural grassland restoration efforts at Bear Valley in Colusa County and at the decommissioned Mather Air Force Base in Sacramento County.

Mercury effects on Red-legged Frog. Assisted Dr. Michael Morrison and US Fish and Wildlife Service in assessing the possible impacts of historical mercury mining on the federally listed California red-legged frog in Santa Clara County. Also measured habitat variables in streams.

Opposition to proposed No Surprises rule. Wrote a white paper and summary letter explaining scientific grounds for opposing the incidental take permit (ITP) rules providing ITP applicants and holders with general assurances they will be free of compliance with the Endangered Species Act once they adhere to the terms of a "properly functioning HCP." Submitted 188 signatures of scientists and environmental professionals concerned about No Surprises rule US Fish and Wildlife Service, National Marine Fisheries Service, all US Senators.

Natomas Basin Habitat Conservation Plan alternative. Designed narrow channel marsh to increase the likelihood of survival and recovery in the wild of giant garter snake, Swainson's hawk and Valley Elderberry Longhorn Beetle. The design included replication and interspersion of treatments for experimental testing of critical habitat elements. I provided a report to Northern Territories, Inc.

Assessments of agricultural production system and environmental technology transfer to China. Twice visited China and interviewed scientists, industrialists, agriculturalists, and the Directors of the Chinese Environmental Protection Agency and the Department of Agriculture to assess the need and possible pathways for environmental clean-up technologies and trade opportunities between the US and China.

Yolo County Habitat Conservation Plan. Conducted landscape ecology study of Yolo County to spatially prioritize allocation of mitigation efforts to improve ecosystem functionality within the County from the perspective of 29 special-status species of wildlife and plants. Used a hierarchically structured indicators approach to apply principles of landscape and ecosystem ecology, conservation biology, and local values in rating land units. Derived GIS maps to help guide the conservation area design, and then developed implementation strategies.

Mountain lion track count. Developed and conducted a carnivore monitoring program throughout California since 1985. Species counted include mountain lion, bobcat, black bear, coyote, red and gray fox, raccoon, striped skunk, badger, and black-tailed deer. Vegetation and land use are also monitored. Track survey transect was established on dusty, dirt roads within randomly selected quadrats.

Sumatran tiger and other felids. Upon award of Fulbright Research Fellowship, I designed and initiated track counts for seven species of wild cats in Sumatra, including Sumatran tiger, fishing cat, and golden cat. Spent four months on Sumatra and Java in 1988, and learned Bahasa Indonesia, the official Indonesian language.

Wildlife in agriculture. Beginning as post-graduate research, I studied pocket gophers and other wildlife in 40 alfalfa fields throughout the Sacramento Valley, and I surveyed for wildlife along a 200 mile road transect since 1989 with a hiatus of 1996-2004. The data are analyzed using GIS and methods from landscape ecology, and the results published and presented orally to farming groups in California and elsewhere. I also conducted the first study of wildlife in cover crops used on vineyards and orchards.

Agricultural energy use and Tulare County groundwater study. Developed and analyzed a data base of energy use in California agriculture, and collaborated on a landscape (GIS) study of groundwater contamination across Tulare County, California.

Pocket gopher damage in forest clear-cuts. Developed gopher sampling methods and tested various poison baits and baiting regimes in the largest-ever field study of pocket gopher management in forest plantations, involving 68 research plots in 55 clear-cuts among 6 National Forests in northern California.

Risk assessment of exotic species in North America. Developed empirical models of mammal and bird species invasions in North America, as well as a rating system for assigning priority research and control to exotic species in California, based on economic, environmental, and human health hazards.

Peer Reviewed Publications

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Comments on Environmental Documents (Year; pages)

I was retained or commissioned to comment on environmental planning and review documents, including:

- Shirk & Riggin Industrial Park Application, Visalia (2022; 22);
- Duarte Industrial Application, Visalia (2022; 17);
- Amond World Cold Storage Warehouse IS/MND, Madera (2022; 23);
- Replies on Schulte Logistics Centre EIR, Tracy (2022; 28);
- Alta Cuvee Mixed Use Project Recirculated IS/MND, Ranch Cucamonga (2022; 8);
- Fourth visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2022; 9);
- Replies on 1242 20th Street Wellness Center Project FEIR, Santa Monica (2022; 5);
- 656 South San Vicente Medical Office Project EIR, Los Angeles (2022; 21);
- UCSF New Hospital at Parnassus Heights DEIR. San Francisco (2022; 40);
- DPR-21-021Warehouse IS, Modesto (2022; 19);
- Ormat Brawley Solar Project DEIR, Brawley (2022; 37);
- Site visits to Heber 1 Geothermal Repower Project IS/MND (2022; 31);
- Heritage Industrial Center Design Review, Chula Vista (2022; 13);
- Temporary Outdoor Vehicle Storage DEIR, Port of Hueneme (2022; 29);
- CNU Medical Center and Innovation Park DEIR, Natomas (2022; 35);
- Beverly Boulevard Warehouse IS/MND, Pico Rivera (2021; 28);
- Hagemon Properties IS/MND Amendment, Bakersfield (2022; 23);
- Airport Distribution Center IS/MND, Redding (2021; 22);
- Orchard on Nevada Warehouse Staff Report, Redlands (2021; 24);
- Landings Logistics Center Exemption, Bakersfield (2021; 19);
- Replies on Hearn Veterans Village IS/MND, Santa Rosa (2021; 22);
- North Central Valley BESS Project IS/MND, Stockton (2021; 37);
- 2nd Replies on Heber 1 Geothermal Repower Project IS/MND (2022; 21);
- Stagecoach Solar DEIR, Barstow (2021; 24);
- Updated Sun Lakes Village North EIR Amendment 5, Banning, Riverside County (2021; 35);
- Freedom Circle Focus Area and Greystar General Plan Amendment Project EIR, San Jose (2021; 43);
- Operon HKI Warehouse IS/MND, Perris (2021; 26);
- Fairway Business Park Phase III IS/MND, Lake Elsinore (2021; 23);
- South Stockton Commerce Center IS/MND, Stockton (2021; 31);
- Starpoint Warehouse IS/MND, San Bernardino (2021; 24);
- Replies on Heber 1 Geothermal Repower Project IS/MND (2021; 15);
- Heber 1 Geothermal Repower Project IS/MND (2021; 11);

- Alviso Hotel Project IS/MND, San Jose (2021; 43);
- Replies on Easton Research Park West IS/MND, Rancho Cordova (2021; 3);
- Easton Research Park West IS/MND, Rancho Cordova (2021; 31);
- US Cold Storage DEIR, Hesperia (2021; 30);
- 1242 20th Street Wellness Center Project FEIR, Santa Monica (2021; 23);
- Third visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 10);
- Roseland Creek Community Park Project IS/MND, Santa Rosa (2021; 23);
- Vista Mar Declaration of Irreparable Harm, Pacifica (2021; 3);
- LogistiCenter at Fairfield IS/MND (2021; 25);
- Alta Cuvee Mixed Use Project IS/MND, Ranch Cucamonga (2021; 29);
- Caligrows Architectural and Site Plan Review, Patterson (2021; 21);
- 1055 E. Sandhill Avenue Warehouse IS/MND, Carson (2021; 10);
- Chestnut & Tenth Street Commercial Project IS/MND, Gilroy (2021; 27);
- Libitzky Management Warehouse IS/MND, Modesto (2021; 20);
- 3rd Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2021; 10);
- Medical Office Building DEIR, Santa Cruz (2021; 30);
- Scannell Warehouse DEIR, Richmond (2021; 24);
- Diamond Heights Application, San Francisco (2021; 24);
- Costa Azul Mixed-Use EIR Addendum, San Diego (2021; 25);
- Woodland Research Park DEIR (2021; 45);
- 2nd Replies on Diamond Street Industrial IS/MND, San Marcos (2021; 9);
- Replies on Diamond Street Industrial IS/MND, San Marcos (2021; 3);
- Diamond Street Industrial IS/MND, San Marcos (2021; 28);
- DHS 109 Industrial Park IS/MND, Desert Hot Springs (2021; 33);
- Jersey Industrial Complex Rancho Cucamonga (2022; 22);
- 1188 Champions Drive Parking Garage Staff Report, San Jose (2021; 5);
- San Pedro Mountain, Pacifica (2021; 22);
- Pixior Warehouse IS/MND, Hesperia (2021; 29);
- 2nd Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2021; 9);
- Hearn Veterans Village IS/MND, Santa Rosa (2021; 23);
- Second visit, Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 11);
- Replies on Station East Residential/Mixed Use EIR, Union City (2021; 26);
- Schulte Logistics Centre EIR, Tracy (2021; 30);
- 4150 Point Eden Way Industrial Development EIR, Hayward (2021; 13);
- Airport Business Centre IS/MND, Manteca (2021; 27);
- Dual-branded Hotel IS/MND, Santa Clara (2021; 26);
- Legacy Highlands Specific Plan EIR, Beaumont (2021; 47);
- UC Berkeley LRDP and Housing Projects #1 and #2 EIR (2021; 27);
- Santa Maria Airport Business Park EIR, Santa Maria (2021; 27);
- Replies on Coachella Valley Arena EIR Addendum, Thousand Palms (2021; 20);
- Coachella Valley Arena EIR Addendum, Thousand Palms (2021; 35);
- Inland Harbor Warehouse NOD, Ontario (2021; 8);
- Alvarado Specific Plan DEIR, La Mesa (2021; 35);
- Harvill Avenue and Rider Street Terminal Project MND, Riverside (2021; 23);

- Gillespie Field EIR Addendum, El Cajon (2021; 28);
- Heritage Wind Energy Project section 94-c siting process, New York (2021: 99);
- Commercial Street Hotels project Site Plans, Oakland (2021; 19);
- Heber 1 Geothermal Repower Project MND, El Centro (2021; 11);
- Citrus-Slover Warehouse Project MND, Fontana (2021; 20);
- Scott Ranch Project RDEIR (Davidon Homes), Petaluma (2021; 31);
- Replies on StratosFuel Renewable H2 Project MND, Victorville (2021; 5);
- StratosFuel Renewable H2 Project MND, Victorville (2021; 25);
- Replies on PARS Global Storage MND, Murietta (2021; 22);
- Baldwin-Zacharias Master Plans EIR, Patterson (2021; 38);
- 1000 Gibraltar Drive EIR, Milpitas (2021; 20);
- Mango Avenue Industrial Warehouse Project, Fontana, MND (2021; 20);
- Veterans Affairs Site Plan Review No. 20-0102 MND, Bakersfield (2021; 25);
- Replies on UCSF Comprehensive Parnassus Heights Plan EIR (2021; 13);
- 14 Charles Hill Circle Design Review (2021; 11);
- SDG Commerce 217 Warehouse IS, American Canyon (2021; 26);
- Mulqueeney Ranch Wind Repowering Project DSEIR (2021; 98);
- Clawiter Road Industrial Project IS/MND, Hayward (2021; 18);
- Garnet Energy Center Stipulations, New York (2020);
- Heritage Wind Energy Project, New York (2020: 71);
- Ameresco Keller Canyon RNG Project IS/MND, Martinez (2020; 11);
- Cambria Hotel Project Staff Report, Dublin (2020; 19);
- Central Pointe Mixed-Use Staff Report, Santa Ana (2020; 20);
- Oak Valley Town Center EIR Addendum, Calimesa (2020; 23);
- Coachillin Specific Plan MND Amendment, Desert Hot Springs (2020; 26);
- Stockton Avenue Hotel and Condominiums Project Tiering to EIR, San Jose (2020; 19);
- Cityline Sub-block 3 South Staff Report, Sunyvale (2020; 22);
- Station East Residential/Mixed Use EIR, Union City (2020; 21);
- Multi-Sport Complex & Southeast Industrial Annexation Suppl. EIR, Elk Grove (2020; 24);
- Sun Lakes Village North EIR Amendment 5, Banning, Riverside County (2020; 27);
- 2nd comments on 1296 Lawrence Station Road, Sunnyvale (2020; 4);
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- Mesa Wind Project EA, Desert Hot Springs (2020; 31);
- 11th Street Development Project IS/MND, City of Upland (2020; 17);
- Vista Mar Project IS/MND, Pacifica (2020; 17);
- Emerson Creek Wind Project Application, Ohio (2020; 64);
- Replies on Wister Solar Energy Facility EIR, Imperial County (2020; 12);
- Wister Solar Energy Facility EIR, Imperial County (2020; 28);
- Crimson Solar EIS/EIR, Mojave Desert (2020, 35) not submitted;
- Sakioka Farms EIR tiering, Oxnard (2020; 14);
- 3440 Wilshire Project IS/MND, Los Angeles (2020; 19);
- Replies on 2400 Barranca Office Development Project EIR, Irvine (2020; 8);
- 2400 Barranca Office Development Project EIR, Irvine (2020; 25);
- Replies on Heber 2 Geothermal Repower Project IS/MND, El Centro (2020; 4);

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- Lots 4-12 Oddstad Way Project IS/MND, Pacifica (2020; 16);
- Declaration on DDG Visalia Warehouse project (2020; 5);
- Terraces of Lafayette EIR Addendum (2020; 24);
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- Replies to responses on Casmalia and Linden Warehouse, Rialto (2020; 15);
- Clover Project MND, Petaluma (2020; 27);
- Ruby Street Apartments Project Env. Checklist, Hayward (2020; 20);
- Replies to responses on 3721 Mt. Diablo Boulevard Staff Report (2020; 5);
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- Steeno Warehouse IS/MND, Hesperia (2020; 19);
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- North Pointe Business Center MND, Fresno (2020; 14);
- Casmalia and Linden Warehouse IS, Fontana (2020; 15);
- Rubidoux Commerce Center Project IS/MND, Jurupa Valley (2020; 27);
- Haun and Holland Mixed Use Center MND, Menifee (2020; 23);
- First Industrial Logistics Center II, Moreno Valley IS/MND (2020; 23);
- GLP Store Warehouse Project Staff Report (2020; 15);
- Replies on Beale WAPA Interconnection Project EA & CEQA checklist (2020; 29);
- 2nd comments on Beale WAPA Interconnection Project EA & CEQA checklist (2020; 34);
- Beale WAPA Interconnection Project EA & CEQA checklist (2020; 30);
- Levine-Fricke Softball Field Improvement Addendum, UC Berkeley (2020; 16);
- Greenlaw Partners Warehouse and Distribution Center Staff Report, Palmdale (2020; 14);
- Humboldt Wind Energy Project DEIR (2019; 25);
- Sand Hill Supplemental EIR, Altamont Pass (2019; 17);
- 1700 Dell Avenue Office Project, Campbell (2019, 28);
- 1180 Main Street Office Project MND, Redwood City (2019; 19:
- Summit Ridge Wind Farm Request for Amendment 4, Oregon (2019; 46);
- Shafter Warehouse Staff Report (2019; 4);
- Park & Broadway Design Review, San Diego (2019; 19);
- Pinnacle Pacific Heights Design Review, San Diego (2019; 19);
- Pinnacle Park & C Design Review, San Diego (2019; 19);
- Preserve at Torrey Highlands EIR, San Diego (2019; 24);
- Santana West Project EIR Addendum, San Jose (2019; 18);
- The Ranch at Eastvale EIR Addendum, Riverside County (2020; 19);
- Hageman Warehouse IS/MND, Bakersfield (2019; 13);
- Oakley Logistics Center EIR, Antioch (2019; 22);
- 27 South First Street IS, San Jose (2019; 23);
- 2nd replies on Times Mirror Square Project EIR, Los Angeles (2020; 11);
- Replies on Times Mirror Square Project EIR, Los Angeles (2020; 13);
- Times Mirror Square Project EIR, Los Angeles (2019; 18);
- East Monte Vista & Aviator General Plan Amend EIR Addendum, Vacaville (2019; 22);
- Hillcrest LRDP EIR, La Jolla (2019; 36);

- 555 Portola Road CUP, Portola Valley (2019; 11);
- Johnson Drive Economic Development Zone SEIR, Pleasanton (2019; 27);
- 1750 Broadway Project CEQA Exemption, Oakland (2019; 19);
- Mor Furniture Project MND, Murietta Hot Springs (2019; 27);
- Harbor View Project EIR, Redwood City (2019; 26);
- Visalia Logistics Center (2019; 13);
- Cordelia Industrial Buildings MND (2019; 14);
- Scheu Distribution Center IS/ND, Rancho Cucamonga (2019; 13);
- Mills Park Center Staff Report, San Bruno (2019; 22);
- Site visit to Desert Highway Farms IS/MND, Imperial County (2019; 9);
- Desert Highway Farms IS/MND, Imperial County (2019; 12);
- ExxonMobil Interim Trucking for Santa Ynez Unit Restart SEIR, Santa Barbara (2019; 9);
- Olympic Holdings Inland Center Warehouse Project MND, Rancho Cucamonga (2019; 14);
- Replies to responses on Lawrence Equipment Industrial Warehouse, Banning (2019; 19);
- PARS Global Storage MND, Murietta (2019; 13);
- Slover Warehouse EIR Addendum, Fontana (2019; 16);
- Seefried Warehouse Project IS/MND, Lathrop (2019; 19)
- World Logistics Center Site Visit, Moreno Valley (2019; 19);
- Merced Landfill Gas-To-Energy Project IS/MND (2019; 12);
- West Village Expansion FEIR, UC Davis (2019; 11);
- Site visit, Doheny Ocean Desalination EIR, Dana Point (2019; 11);
- Replies to responses on Avalon West Valley Expansion EIR, San Jose (2019; 10);
- Avalon West Valley Expansion EIR, San Jose (2019; 22);
- Sunroad – Otay 50 EIR Addendum, San Diego (2019; 26);
- Del Rey Pointe Residential Project IS/MND, Los Angeles (2019; 34);
- 1 AMD Redevelopment EIR, Sunnyvale (2019; 22);
- Lawrence Equipment Industrial Warehouse IS/MND, Banning (2019; 14);
- SDG Commerce 330 Warehouse IS, American Canyon (2019; 21);
- PAMA Business Center IS/MND, Moreno Valley (2019; 23);
- Cupertino Village Hotel IS (2019; 24);
- Lake House IS/ND, Lodi (2019; 33);
- Campo Wind Project DEIS, San Diego County (DEIS, (2019; 14);
- Stirling Warehouse MND site visit, Victorville (2019; 7);
- Green Valley II Mixed-Use Project EIR, Fairfield (2019; 36);
- We Be Jammin rezone MND, Fresno (2019; 14);
- Gray Whale Cove Pedestrian Crossing IS/ND, Pacifica (2019; 7);
- Visalia Logistics Center & DDG 697V Staff Report (2019; 9);
- Mather South Community Masterplan Project EIR (2019; 35);
- Del Hombre Apartments EIR, Walnut Creek (2019; 23);
- Otay Ranch Planning Area 12 EIR Addendum, Chula Vista (2019; 21);
- The Retreat at Sacramento IS/MND (2019; 26);
- Site visit to Sunroad – Centrum 6 EIR Addendum, San Diego (2019; 9);
- Sunroad – Centrum 6 EIR Addendum, San Diego (2018; 22);
- North First and Brokaw Corporate Campus Buildings EIR Addendum, San Jose (2018; 30);

- South Lake Solar IS, Fresno County (2018; 18);
- Galloo Island Wind Project Application, New York (not submitted) (2018; 44);
- Doheny Ocean Desalination EIR, Dana Point (2018; 15);
- Stirling Warehouse MND, Victorville (2018; 18);
- LDK Warehouse MND, Vacaville (2018; 30);
- Gateway Crossings FEIR, Santa Clara (2018; 23);
- South Hayward Development IS/MND (2018; 9);
- CBU Specific Plan Amendment, Riverside (2018; 27);
- 2nd replies to responses on Dove Hill Road Assisted Living Project MND (2018; 11);
- Replies to responses on Dove Hill Road Assisted Living Project MND (2018; 7);
- Dove Hill Road Assisted Living Project MND (2018; 12);
- Deer Ridge/Shadow Lakes Golf Course EIR, Brentwood (2018; 21);
- Pyramid Asphalt BLM Finding of No Significance, Imperial County (2018; 22);
- Amáre Apartments IS/MND, Martinez (2018; 15);
- Petaluma Hill Road Cannabis MND, Santa Rosa (2018; 21);
- 2nd comments on Zeiss Innovation Center IS/MND, Dublin (2018: 12);
- Zeiss Innovation Center IS/MND, Dublin (2018: 32);
- City of Hope Campus Plan EIR, Duarte (2018; 21);
- Palo Verde Center IS/MND, Blythe (2018; 14);
- Logisticenter at Vacaville MND (2018; 24);
- IKEA Retail Center SEIR, Dublin (2018; 17);
- Merge 56 EIR, San Diego (2018; 15);
- Natomas Crossroads Quad B Office Project P18-014 EIR, Sacramento (2018; 12);
- 2900 Harbor Bay Parkway Staff Report, Alameda (2018; 30);
- At Dublin EIR, Dublin (2018; 25);
- Fresno Industrial Rezone Amendment Application No. 3807 IS (2018; 10);
- Nova Business Park IS/MND, Napa (2018; 18);
- Updated Collision Risk Model Priors for Estimating Eagle Fatalities, USFWS (2018; 57);
- 750 Marlborough Avenue Warehouse MND, Riverside (2018; 14);
- Replies to responses on San Bernardino Logistics Center IS (2018; 12);
- San Bernardino Logistics Center IS (2018; 19);
- CUP2017-16, Costco IS/MND, Clovis (2018; 11);
- Desert Land Ventures Specific Plan EIR, Desert Hot Springs (2018; 18);
- Ventura Hilton IS/MND (2018; 30);
- North of California Street Master Plan Project IS, Mountain View (2018: 11);
- Tamarind Warehouse MND, Fontana (2018; 16);
- Lathrop Gateway Business Park EIR Addendum (2018; 23);
- Centerpointe Commerce Center IS, Moreno Valley (2019; 18);
- Amazon Warehouse Notice of Exemption, Bakersfield (2018; 13);
- CenterPoint Building 3 project Staff Report, Manteca (2018; 23);
- Cessna & Aviator Warehouse IS/MND, Vacaville (2018; 24);
- Napa Airport Corporate Center EIR, American Canyon (2018, 15);
- 800 Opal Warehouse Initial Study, Mentone, San Bernardino County (2018; 18);
- 2695 W. Winton Ave Industrial Project IS, Hayward (2018; 22);

- Trinity Cannabis Cultivation and Manufacturing Facility DEIR, Calexico (2018; 15);
- Shoe Palace Expansion IS/MND, Morgan Hill (2018; 21);
- Newark Warehouse at Morton Salt Plant Staff Report (2018; 15);
- Northlake Specific Plan FEIR "Peer Review", Los Angeles County (2018; 9);
- Replies to responses on Northlake Specific Plan SEIR, Los Angeles County (2018; 13);
- Northlake Specific Plan SEIR, Los Angeles County (2017; 27);
- Bogle Wind Turbine DEIR, east Yolo County (2017; 48);
- Ferrante Apartments IS/MND, Los Angeles (2017; 14);
- The Villages of Lakeview EIR, Riverside (2017; 28);
- Data Needed for Assessing Trail Management Impacts on Northern Spotted Owl, Marin County (2017; 5);
- Notes on Proposed Study Options for Trail Impacts on Northern Spotted Owl (2017; 4);
- Pyramid Asphalt IS, Imperial County (Declaration) (2017; 5);
- San Gorgonio Crossings EIR, Riverside County (2017; 22);
- Replies to responses on Jupiter Project IS and MND, Apple Valley (2017; 12);
- Proposed World Logistics Center Mitigation Measures, Moreno Valley (2017, 2019; 12);
- MacArthur Transit Village Project Modified 2016 CEQA Analysis (2017; 12);
- PG&E Company Bay Area Operations and Maintenance HCP (2017; 45);
- Central SoMa Plan DEIR (2017; 14);
- Suggested mitigation for trail impacts on northern spotted owl, Marin County (2016; 5);
- Colony Commerce Center Specific Plan DEIR, Ontario (2016; 16);
- Fairway Trails Improvements MND, Marin County (2016; 13);
- Review of Avian-Solar Science Plan (2016; 28);
- Replies on Pyramid Asphalt IS, Imperial County (2016; 5);
- Pyramid Asphalt IS, Imperial County (2016; 4);
- Agua Mansa Distribution Warehouse Project Initial Study (2016; 14);
- Santa Anita Warehouse MND, Rancho Cucamonga (2016; 12);
- CapRock Distribution Center III DEIR, Rialto (2016: 12);
- Orange Show Logistics Center IS/MND, San Bernardino (2016; 9);
- City of Palmdale Oasis Medical Village Project IS/MND (2016; 7);
- Comments on proposed rule for incidental eagle take, USFWS (2016, 49);
- Replies on Grapevine Specific and Community Plan FEIR, Kern County (2016; 25);
- Grapevine Specific and Community Plan DEIR, Kern County (2016; 15);
- Clinton County Zoning Ordinance for Wind Turbine siting (2016);
- Hallmark at Shenandoah Warehouse Project Initial Study, San Bernardino (2016; 6);
- Tri-City Industrial Complex Initial Study, San Bernardino (2016; 5);
- Hidden Canyon Industrial Park Plot Plan 16-PP-02, Beaumont (2016; 12);
- Kimball Business Park DEIR (2016; 10);
- Jupiter Project IS and MND, Apple Valley, San Bernardino County (2016; 9);
- Revised Draft Giant Garter Snake Recovery Plan of 2015 (2016, 18);
- Palo Verde Mesa Solar Project EIR, Blythe (2016; 27);
- Reply on Fairview Wind Project Natural Heritage Assessment, Ontario, Canada (2016; 14);
- Fairview Wind Project Natural Heritage Assessment, Ontario, Canada (2016; 41);
- Reply on Amherst Island Wind Farm Natural Heritage Assessment, Ontario (2015, 38);

- Amherst Island Wind Farm Natural Heritage Assessment, Ontario (2015, 31);
- Second Reply on White Pines Wind Farm, Ontario (2015, 6);
- Reply on White Pines Wind Farm Natural Heritage Assessment, Ontario (2015, 10);
- White Pines Wind Farm Natural Heritage Assessment, Ontario (2015, 9);
- Proposed Section 24 Specific Plan Agua Caliente Band of Cahuilla Indians DEIS (2015, 9);
- Replies on 24 Specific Plan Agua Caliente Band of Cahuilla Indians FEIS (2015, 6);
- Sierra Lakes Commerce Center Project DEIR, Fontana (2015, 9);
- Columbia Business Center MND, Riverside (2015; 8);
- West Valley Logistics Center Specific Plan DEIR, Fontana (2015, 10);
- Willow Springs Solar Photovoltaic Project DEIR (2015, 28);
- Alameda Creek Bridge Replacement Project DEIR (2015, 10);
- World Logistic Center Specific Plan FEIR, Moreno Valley (2015, 12);
- Elkhorn Valley Wind Power Project Impacts, Oregon (2015; 143);
- Bay Delta Conservation Plan EIR/EIS, Sacramento (2014, 21);
- Addison Wind Energy Project DEIR, Mojave (2014, 32);
- Replies on the Addison Wind Energy Project DEIR, Mojave (2014, 15);
- Addison and Rising Tree Wind Energy Project FEIR, Mojave (2014, 12);
- Palen Solar Electric Generating System FSA (CEC), Blythe (2014, 20);
- Rebuttal testimony on Palen Solar Energy Generating System (2014, 9);
- Seven Mile Hill and Glenrock/Rolling Hills impacts + Addendum, Wyoming (2014; 105);
- Rising Tree Wind Energy Project DEIR, Mojave (2014, 32);
- Replies on the Rising Tree Wind Energy Project DEIR, Mojave (2014, 15);
- Soitec Solar Development Project PEIR, Boulevard, San Diego County (2014, 18);
- Oakland Zoo expansion on Alameda whipsnake and California red-legged frog (2014; 3);
- Alta East Wind Energy Project FEIS, Tehachapi Pass (2013, 23);
- Blythe Solar Power Project Staff Assessment, California Energy Commission (2013, 16);
- Clearwater and Yakima Solar Projects DEIR, Kern County (2013, 9);
- West Antelope Solar Energy Project IS/MND, Antelope Valley (2013, 18);
- Cuyama Solar Project DEIR, Carrizo Plain (2014, 19);
- Desert Renewable Energy Conservation Plan (DRECP) EIR/EIS (2015, 49);
- Kingbird Solar Photovoltaic Project EIR, Kern County (2013, 19);
- Lucerne Valley Solar Project IS/MND, San Bernardino County (2013, 12);
- Tule Wind project FEIR/FEIS (Declaration) (2013; 31);
- Sunlight Partners LANDPRO Solar Project MND (2013; 11);
- Declaration in opposition to BLM fracking (2013; 5);
- Blythe Energy Project (solar) CEC Staff Assessment (2013;16);
- Rosamond Solar Project EIR Addendum, Kern County (2013; 13);
- Pioneer Green Solar Project EIR, Bakersfield (2013; 13);
- Replies on Soccer Center Solar Project MND (2013; 6);
- Soccer Center Solar Project MND, Lancaster (2013; 10);
- Plainview Solar Works MND, Lancaster (2013; 10);
- Alamo Solar Project MND, Mojave Desert (2013; 15);
- Replies on Imperial Valley Solar Company 2 Project (2013; 10);
- Imperial Valley Solar Company 2 Project (2013; 13);

- FRV Orion Solar Project DEIR, Kern County (PP12232) (2013; 9);
- Casa Diablo IV Geothermal Development Project (2013; 6);
- Reply on Casa Diablo IV Geothermal Development Project (2013; 8);
- Alta East Wind Project FEIS, Tehachapi Pass (2013; 23);
- Metropolitan Air Park DEIR, City of San Diego (2013;);
- Davidon Homes Tentative Subdivision Rezoning Project DEIR, Petaluma (2013; 9);
- Oakland Zoo Expansion Impacts on Alameda Whipsnake (2013; 10);
- Campo Verde Solar project FEIR, Imperial Valley (2013; 11pp);
- Neg Dec comments on Davis Sewer Trunk Rehabilitation (2013; 8);
- North Steens Transmission Line FEIS, Oregon (Declaration) (2012; 62);
- Summer Solar and Springtime Solar Projects IS/MND Lancaster (2012; 8);
- J&J Ranch, 24 Adobe Lane Environmental Review, Orinda (2012; 14);
- Replies on Hudson Ranch Power II Geothermal Project and Simbol Calipatria Plant II (2012; 8);
- Hudson Ranch Power II Geothermal Project and Simbol Calipatria Plant II (2012; 9);
- Desert Harvest Solar Project EIS, near Joshua Tree (2012; 15);
- Solar Gen 2 Array Project DEIR, El Centro (2012; 16);
- Ocotillo Sol Project EIS, Imperial Valley (2012; 4);
- Beacon Photovoltaic Project DEIR, Kern County (2012; 5);
- Butte Water District 2012 Water Transfer Program IS/MND (2012; 11);
- Mount Signal and Calexico Solar Farm Projects DEIR (2011; 16);
- City of Elk Grove Sphere of Influence EIR (2011; 28);
- Sutter Landing Park Solar Photovoltaic Project MND, Sacramento (2011; 9);
- Rabik/Gudath Project, 22611 Coleman Valley Road, Bodega Bay (CPN 10-0002) (2011; 4);
- Ivanpah Solar Electric Generating System (ISEGS) (Declaration) (2011; 9);
- Draft Eagle Conservation Plan Guidance, USFWS (2011; 13);
- Niles Canyon Safety Improvement Project EIR/EA (2011; 16);
- Route 84 Safety Improvement Project (Declaration) (2011; 7);
- Rebuttal on Whistling Ridge Wind Energy Power DEIS, Skamania County, (2010; 6);
- Whistling Ridge Wind Energy Power DEIS, Skamania County, Washington (2010; 41);
- Klickitat County's Decisions on Windy Flats West Wind Energy Project (2010; 17);
- St. John's Church Project DEIR, Orinda (2010; 14);
- Results Radio Zone File #2009-001 IS/MND, Conaway site, Davis (2010; 20);
- Rio del Oro Specific Plan Project FEIR, Rancho Cordova (2010;12);
- Results Radio Zone File #2009-001, Mace Blvd site, Davis (2009; 10);
- Answers to Questions on 33% RPS Implementation Analysis Preliminary Results Report (2009; 9);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington (Second Declaration) (2008; 17);
- Draft 1A Summary Report to CAISO (2008; 10);
- Hilton Manor Project Categorical Exemption, County of Placer (2009; 9);
- Protest of CARE to Amendment to the Power Purchase and Sale Agreement for Procurement of Eligible Renewable Energy Resources Between Hatchet Ridge Wind LLC and PG&E (2009; 3);

- Tehachapi Renewable Transmission Project EIR/EIS (2009; 142);
- Delta Shores Project EIR, south Sacramento (2009; 11 + addendum 2);
- Declaration in Support of Care's Petition to Modify D.07-09-040 (2008; 3);
- The Public Utility Commission's Implementation Analysis December 16 Workshop for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 9);
- The Public Utility Commission's Implementation Analysis Draft Work Plan for the Governor's Executive Order S-14-08 to implement a 33% Renewable Portfolio Standard by 2020 (2008; 11);
- Draft 1A Summary Report to California Independent System Operator for Planning Reserve Margins (PRM) Study (2008; 7.);
- SEPA Determination of Non-significance regarding zoning adjustments for Skamania County, Washington (Declaration) (2008; 16);
- Colusa Generating Station, California Energy Commission PSA (2007; 24);
- Rio del Oro Specific Plan Project Recirculated DEIR, Mather (2008: 66);
- Replies on Regional University Specific Plan EIR, Roseville (2008; 20);
- Regional University Specific Plan EIR, Roseville (2008: 33);
- Clark Precast, LLC's "Sugarland" project, ND, Woodland (2008: 15);
- Cape Wind Project DEIS, Nantucket (2008; 157);
- Yuba Highlands Specific Plan EIR, Spenceville, Yuba County (2006; 37);
- Replies to responses on North Table Mountain MND, Butte County (2006; 5);
- North Table Mountain MND, Butte County (2006; 15);
- Windy Point Wind Farm EIS (2006; 14 and Powerpoint slide replies);
- Shiloh I Wind Power Project EIR, Rio Vista (2005; 18);
- Buena Vista Wind Energy Project NOP, Byron (2004; 15);
- Callahan Estates Subdivision ND, Winters (2004; 11);
- Winters Highlands Subdivision IS/ND (2004; 9);
- Winters Highlands Subdivision IS/ND (2004; 13);
- Creekside Highlands Project, Tract 7270 ND (2004; 21);
- Petition to California Fish and Game Commission to list Burrowing Owl (2003; 10);
- Altamont Pass Wind Resource Area CUP renewals, Alameda County (2003; 41);
- UC Davis Long Range Development Plan: Neighborhood Master Plan (2003; 23);
- Anderson Marketplace Draft Environmental Impact Report (2003; 18);
- Negative Declaration of the proposed expansion of Temple B'nai Tikyah (2003; 6);
- Antonio Mountain Ranch Specific Plan Public Draft EIR (2002; 23);
- Replies on East Altamont Energy Center evidentiary hearing (2002; 9);
- Revised Draft Environmental Impact Report, The Promenade (2002; 7);
- Recirculated Initial Study for Calpine's proposed Pajaro Valley Energy Center (2002; 3);
- UC Merced -- Declaration (2002; 5);
- Replies on Atwood Ranch Unit III Subdivision FEIR (2003; 22);
- Atwood Ranch Unit III Subdivision EIR (2002; 19);
- California Energy Commission Staff Report on GWF Tracy Peaker Project (2002; 20);
- Silver Bend Apartments IS/MND, Placer County (2002; 13);
- UC Merced Long-range Development Plan DEIR and UC Merced Community Plan DEIR (2001; 26);

- Colusa County Power Plant IS, Maxwell (2001; 6);
- Dog Park at Catlin Park, Folsom, California (2001; 5);
- Calpine and Bechtel Corporations' Biological Resources Implementation and Monitoring Program (BRMIMP) for the Metcalf Energy Center (2000; 10);
- Metcalf Energy Center, California Energy Commission FSA (2000);
- US Fish and Wildlife Service Section 7 consultation with the California Energy Commission regarding Calpine and Bechtel Corporations' Metcalf Energy Center (2000; 4);
- California Energy Commission's Preliminary Staff Assessment of the proposed Metcalf Energy Center (2000: 11);
- Site-specific management plans for the Natomas Basin Conservancy's mitigation lands, prepared by Wildlands, Inc. (2000: 7);
- Affidavit of K. Shawn Smallwood in Spirit of the Sage Council, et al. (Plaintiffs) vs. Bruce Babbitt, Secretary, U.S. Department of the Interior, et al. (Defendants), Injuries caused by the No Surprises policy and final rule which codifies that policy (1999: 9).
- California Board of Forestry's proposed amended Forest Practices Rules (1999);
- Sunset Skyranch Airport Use Permit IS/MND (1999);
- Ballona West Bluffs Project Environmental Impact Report (1999; oral presentation);
- Draft Recovery Plan for Giant Garter Snake (Fed. Reg. 64(176): 49497-49498) (1999; 8);
- Draft Recovery Plan for Arroyo Southwestern Toad (1998);
- Pacific Lumber Co. (Headwaters) HCP & EIR, Fortuna (1998; 28);
- Natomas Basin HCP Permit Amendment, Sacramento (1998);
- San Diego Multi-Species Conservation Program FEIS/FEIR (1997; 10);

Comments on other Environmental Review Documents:

- Proposed Regulation for California Fish and Game Code Section 3503.5 (2015: 12);
- Statement of Overriding Considerations related to extending Altamont Winds, Inc.'s Conditional Use Permit PLN2014-00028 (2015; 8);
- Covell Village PEIR, Davis (2005; 19);
- Bureau of Land Management Wind Energy Programmatic EIS Scoping (2003; 7.);
- NEPA Environmental Analysis for Biosafety Level 4 National Biocontainment Laboratory (NBL) at UC Davis (2003: 7);
- Notice of Preparation of UC Merced Community and Area Plan EIR, on behalf of The Wildlife Society—Western Section (2001: 8.);
- Preliminary Draft Yolo County Habitat Conservation Plan (2001; 2 letters totaling 35.);
- Merced County General Plan Revision, notice of Negative Declaration (2001: 2.);
- Notice of Preparation of Campus Parkway EIR/EIS (2001: 7.);
- Draft Recovery Plan for the bighorn sheep in the Peninsular Range (*Ovis candensis*) (2000);
- Draft Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*), on behalf of The Wildlife Society—Western Section (2000: 10.);
- Sierra Nevada Forest Plan Amendment Draft Environmental Impact Statement, on behalf of The Wildlife Society—Western Section (2000: 7.);
- State Water Project Supplemental Water Purchase Program, Draft Program EIR (1997);
- Davis General Plan Update EIR (2000);
- Turn of the Century EIR (1999: 10);

- Proposed termination of Critical Habitat Designation under the Endangered Species Act (Fed. Reg. 64(113): 31871-31874) (1999);
- NOA Draft Addendum to the Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, termed the HCP 5-Point Policy Plan (Fed. Reg. 64(45): 11485 - 11490) (1999; 2 + attachments);
- Covell Center Project EIR and EIR Supplement (1997).

Position Statements I prepared the following position statements for the Western Section of The Wildlife Society, and one for nearly 200 scientists:

- Recommended that the California Department of Fish and Game prioritize the extermination of the introduced southern water snake in northern California. The Wildlife Society--Western Section (2001);
- Recommended that The Wildlife Society—Western Section appoint or recommend members of the independent scientific review panel for the UC Merced environmental review process (2001);
- Opposed the siting of the University of California's 10th campus on a sensitive vernal pool/grassland complex east of Merced. The Wildlife Society--Western Section (2000);
- Opposed the legalization of ferret ownership in California. The Wildlife Society--Western Section (2000);
- Opposed the Proposed "No Surprises," "Safe Harbor," and "Candidate Conservation Agreement" rules, including permit-shield protection provisions (Fed. Reg. Vol. 62, No. 103, pp. 29091-29098 and No. 113, pp. 32189-32194). This statement was signed by 188 scientists and went to the responsible federal agencies, as well as to the U.S. Senate and House of Representatives.

Posters at Professional Meetings

Leyvas, E. and K. S. Smallwood. 2015. Rehabilitating injured animals to offset and rectify wind project impacts. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S., J. Mount, S. Standish, E. Leyvas, D. Bell, E. Walther, B. Karas. 2015. Integrated detection trials to improve the accuracy of fatality rate estimates at wind projects. Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 9-12 March 2015.

Smallwood, K. S. and C. G. Thelander. 2005. Lessons learned from five years of avian mortality research in the Altamont Pass WRA. AWEA conference, Denver, May 2005.

Neher, L., L. Wilder, J. Woo, L. Spiegel, D. Yen-Nakafugi, and K.S. Smallwood. 2005. Bird's eye view on California wind. AWEA conference, Denver, May 2005.

Smallwood, K. S., C. G. Thelander and L. Spiegel. 2003. Toward a predictive model of avian fatalities in the Altamont Pass Wind Resource Area. Windpower 2003 Conference and Convention, Austin, Texas.

Smallwood, K.S. and Eva Butler. 2002. Pocket Gopher Response to Yellow Star-thistle Eradication as part of Grassland Restoration at Decommissioned Mather Air Force Base, Sacramento County,

California. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and Michael L. Morrison. 2002. Fresno kangaroo rat (*Dipodomys nitratoides*) Conservation Research at Resources Management Area 5, Lemoore Naval Air Station. White Mountain Research Station Open House, Barcroft Station.

Smallwood, K.S. and E.L. Fitzhugh. 1989. Differentiating mountain lion and dog tracks. Third Mountain Lion Workshop, Prescott, AZ.

Smith, T. R. and K. S. Smallwood. 2000. Effects of study area size, location, season, and allometry on reported *Sorex* shrew densities. Annual Meeting of the Western Section of The Wildlife Society.

Presentations at Professional Meetings and Seminars

Long-Term Population Trend of Burrowing Owls in the Altamont. Golden Gate Audubon, 21 October 2020.

Long-Term Population Trend of Burrowing Owls in the Altamont. East Bay Regional Park District 2020 Stewardship Seminar, Oakland, California, 18 November 2020.

Smallwood, K.S., D.A. Bell, and S, Standish. Dogs detect larger wind energy effects on bats and birds. The Wildlife Society, 28 September 2020.

Smallwood, K.S. and D.A. Bell. Effects of wind turbine curtailment on bird and bat fatalities in the Altamont Pass Wind Resource Area. The Wildlife Society, 28 September 2020.

Smallwood, K.S., D.A. Bell, and S, Standish. Dogs detect larger wind energy effects on bats and birds. The Wildlife Survey, 7 February 2020.

Smallwood, K.S. and D.A. Bell. Effects of wind turbine curtailment on bird and bat fatalities in the Altamont Pass Wind Resource Area. The Wildlife Survey, 7 February 2020.

Dog detections of bat and bird fatalities at wind farms in the Altamont Pass Wind Resource Area. East Bay Regional Park District 2019 Stewardship Seminar, Oakland, California, 13 November 2019.

Repowering the Altamont Pass. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Developing methods to reduce bird mortality in the Altamont Pass Wind Resource Area, 1999-2007. Altamont Symposium, The Wildlife Society – Western Section, 5 February 2017.

Conservation and recovery of burrowing owls in Santa Clara Valley. Santa Clara Valley Habitat Agency, Newark, California, 3 February 2017.

Mitigation of Raptor Fatalities in the Altamont Pass Wind Resource Area. Raptor Research Foundation Meeting, Sacramento, California, 6 November 2015.

From burrows to behavior: Research and management for burrowing owls in a diverse landscape. California Burrowing Owl Consortium meeting, 24 October 2015, San Jose, California.

The Challenges of repowering. Keynote presentation at Conference on Wind Energy and Wildlife Impacts, Berlin, Germany, 10 March 2015.

Research Highlights Altamont Pass 2011-2015. Scientific Review Committee, Oakland, California, 8 July 2015.

Siting wind turbines to minimize raptor collisions: Altamont Pass Wind Resource Area. US Fish and Wildlife Service Golden Eagle Working Group, Sacramento, California, 8 January 2015.

Evaluation of nest boxes as a burrowing owl conservation strategy. Sacramento Chapter of the Western Section, The Wildlife Society. Sacramento, California, 26 August 2013.

Predicting collision hazard zones to guide repowering of the Altamont Pass. Conference on wind power and environmental impacts. Stockholm, Sweden, 5-7 February 2013.

Impacts of Wind Turbines on Wildlife. California Council for Wildlife Rehabilitators, Yosemite, California, 12 November 2012.

Impacts of Wind Turbines on Birds and Bats. Madrone Audubon Society, Santa Rosa, California, 20 February 2012.

Comparing Wind Turbine Impacts across North America. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. California Energy Commission Staff Workshop: Reducing the Impacts of Energy Infrastructure on Wildlife, 20 July 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Alameda County Scientific Review Committee meeting, 17 February 2011

Comparing Wind Turbine Impacts across North America. Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 3 May 2011.

Update on Wildlife Impacts in the Altamont Pass Wind Resource Area. Raptor Symposium, The Wildlife Society—Western Section, Riverside, California, February 2011.

Siting Repowered Wind Turbines to Minimize Raptor Collisions. Raptor Symposium, The Wildlife Society - Western Section, Riverside, California, February 2011.

Wildlife mortality caused by wind turbine collisions. Ecological Society of America, Pittsburgh, Pennsylvania, 6 August 2010.

Map-based repowering and reorganization of a wind farm to minimize burrowing owl fatalities. California burrowing Owl Consortium Meeting, Livermore, California, 6 February 2010.

Environmental barriers to wind power. Getting Real About Renewables: Economic and Environmental Barriers to Biofuels and Wind Energy. A symposium sponsored by the Environmental & Energy Law & Policy Journal, University of Houston Law Center, Houston, 23 February 2007.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Meeting with Japan Ministry of the Environment and Japan Ministry of the Economy, Wild Bird Society of Japan, and other NGOs Tokyo, Japan, 9 November 2006.

Lessons learned about bird collisions with wind turbines in the Altamont Pass and other US wind farms. Symposium on bird collisions with wind turbines. Wild Bird Society of Japan, Tokyo, Japan, 4 November 2006.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. California Society for Ecological Restoration (SERCAL) 13th Annual Conference, UC Santa Barbara, 27 October 2006.

Fatality associations as the basis for predictive models of fatalities in the Altamont Pass Wind Resource Area. EEI/APLIC/PIER Workshop, 2006 Biologist Task Force and Avian Interaction with Electric Facilities Meeting, Pleasanton, California, 28 April 2006.

Burrowing owl burrows and wind turbine collisions in the Altamont Pass Wind Resource Area. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, February 8, 2006.

Mitigation at wind farms. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Incorporating data from the California Wildlife Habitat Relationships (CWHR) system into an impact assessment tool for birds near wind farms. Shawn Smallwood, Kevin Hunting, Marcus Yee, Linda Spiegel, Monica Parisi. Workshop: Understanding and resolving bird and bat impacts. American Wind Energy Association and Audubon Society. Los Angeles, CA. January 10 and 11, 2006.

Toward indicating threats to birds by California's new wind farms. California Energy Commission, Sacramento, May 26, 2005.

Avian collisions in the Altamont Pass. California Energy Commission, Sacramento, May 26, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. EPRI Environmental Sector Council, Monterey, California, February 17, 2005.

Ecological solutions for avian collisions with wind turbines in the Altamont Pass Wind Resource Area. The Wildlife Society—Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Associations between avian fatalities and attributes of electric distribution poles in California. The Wildlife Society - Western Section Annual Meeting, Sacramento, California, January 19, 2005.

Minimizing avian mortality in the Altamont Pass Wind Resources Area. UC Davis Wind Energy Collaborative Forum, Palm Springs, California, December 14, 2004.

Selecting electric distribution poles for priority retrofitting to reduce raptor mortality. Raptor Research Foundation Meeting, Bakersfield, California, November 10, 2004.

Responses of Fresno kangaroo rats to habitat improvements in an adaptive management framework. Annual Meeting of the Society for Ecological Restoration, South Lake Tahoe, California, October 16, 2004.

Lessons learned from five years of avian mortality research at the Altamont Pass Wind Resources Area in California. The Wildlife Society Annual Meeting, Calgary, Canada, September 2004.

The ecology and impacts of power generation at Altamont Pass. Sacramento Petroleum Association, Sacramento, California, August 18, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Consortium meeting, Hayward, California, February 7, 2004.

Burrowing owl mortality in the Altamont Pass Wind Resource Area. California Burrowing Owl Symposium, Sacramento, November 2, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. National Wind Coordinating Committee, Washington, D.C., November 17, 2003.

Raptor Behavior at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

Raptor Mortality at the Altamont Pass Wind Resource Area. Annual Meeting of the Raptor Research Foundation, Anchorage, Alaska, September, 2003.

California mountain lions. Ecological & Environmental Issues Seminar, Department of Biology, California State University, Sacramento, November, 2000.

Intra- and inter-turbine string comparison of fatalities to animal burrow densities at Altamont Pass. National Wind Coordinating Committee, Carmel, California, May, 2000.

Using a Geographic Positioning System (GPS) to map wildlife and habitat. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Suggested standards for science applied to conservation issues. Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

The indicators framework applied to ecological restoration in Yolo County, California. Society for Ecological Restoration, September 25, 1999.

Ecological restoration in the context of animal social units and their habitat areas. Society for Ecological Restoration, September 24, 1999.

Relating Indicators of Ecological Health and Integrity to Assess Risks to Sustainable Agriculture and Native Biota. International Conference on Ecosystem Health, August 16, 1999.

A crosswalk from the Endangered Species Act to the HCP Handbook and real HCPs. Southern California Edison, Co. and California Energy Commission, March 4-5, 1999.

Mountain lion track counts in California: Implications for Management. Ecological & Environmental Issues Seminar, Department of Biological Sciences, California State University, Sacramento, November 4, 1998.

"No Surprises" -- Lack of science in the HCP process. California Native Plant Society Annual Conservation Conference, The Presidio, San Francisco, September 7, 1997.

In Your Interest. A half hour weekly show aired on Channel 10 Television, Sacramento. In this episode, I served on a panel of experts discussing problems with the implementation of the Endangered Species Act. Aired August 31, 1997.

Spatial scaling of pocket gopher (*Geomyidae*) density. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Estimating prairie dog and pocket gopher burrow volume. Southwestern Association of Naturalists 44th Meeting, Fayetteville, Arkansas, April 10, 1997.

Ten years of mountain lion track survey. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Study and interpretive design effects on mountain lion density estimates. Fifth Mountain Lion Workshop, San Diego, February 27, 1996.

Small animal control. Session moderator and speaker at the California Farm Conference, Sacramento, California, Feb. 28, 1995.

Small animal control. Ecological Farming Conference, Asylomar, California, Jan. 28, 1995.

Habitat associations of the Swainson's Hawk in the Sacramento Valley's agricultural landscape. 1994 Raptor Research Foundation Meeting, Flagstaff, Arizona.

Alfalfa as wildlife habitat. Seed Industry Conference, Woodland, California, May 4, 1994.

Habitats and vertebrate pests: impacts and management. Managing Farmland to Bring Back Game Birds and Wildlife to the Central Valley. Yolo County Resource Conservation District, U.C. Davis, February 19, 1994.

Management of gophers and alfalfa as wildlife habitat. Orland Alfalfa Production Meeting and Sacramento Valley Alfalfa Production Meeting, February 1 and 2, 1994.

Patterns of wildlife movement in a farming landscape. Wildlife and Fisheries Biology Seminar

Series: Recent Advances in Wildlife, Fish, and Conservation Biology, U.C. Davis, Dec. 6, 1993.

Alfalfa as wildlife habitat. California Alfalfa Symposium, Fresno, California, Dec. 9, 1993.

Management of pocket gophers in Sacramento Valley alfalfa. California Alfalfa Symposium, Fresno, California, Dec. 8, 1993.

Association analysis of raptors in a farming landscape. Plenary speaker at Raptor Research Foundation Meeting, Charlotte, North Carolina, Nov. 6, 1993.

Landscape strategies for biological control and IPM. Plenary speaker, International Conference on Integrated Resource Management and Sustainable Agriculture, Beijing, China, Sept. 11, 1993.

Landscape Ecology Study of Pocket Gophers in Alfalfa. Alfalfa Field Day, U.C. Davis, July 1993.

Patterns of wildlife movement in a farming landscape. Spatial Data Analysis Colloquium, U.C. Davis, August 6, 1993.

Sound stewardship of wildlife. Veterinary Medicine Seminar: Ethics of Animal Use, U.C. Davis. May 1993.

Landscape ecology study of pocket gophers in alfalfa. Five County Grower's Meeting, Tracy, California. February 1993.

Turbulence and the community organizers: The role of invading species in ordering a turbulent system, and the factors for invasion success. Ecology Graduate Student Association Colloquium, U.C. Davis. May 1990.

Evaluation of exotic vertebrate pests. Fourteenth Vertebrate Pest Conference, Sacramento, California. March 1990.

Analytical methods for predicting success of mammal introductions to North America. The Western Section of the Wildlife Society, Hilo, Hawaii. February 1988.

A state-wide mountain lion track survey. Sacramento County Dept Parks and Recreation. April 1986.

The mountain lion in California. Davis Chapter of the Audubon Society. October 1985.

Ecology Graduate Student Seminars, U.C. Davis, 1985-1990: Social behavior of the mountain lion; Mountain lion control; Political status of the mountain lion in California.

Other forms of Participation at Professional Meetings

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Berlin, Germany, March 2015.

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Stockholm,

Sweden, February 2013.

- Workshop co-presenter at Birds & Wind Energy Specialist Group (BAWESG) Information sharing week, Bird specialist studies for proposed wind energy facilities in South Africa, Endangered Wildlife Trust, Darling, South Africa, 3-7 October 2011.

- Scientific Committee, Conference on Wind energy and Wildlife impacts, Trondheim, Norway, 2-5 May 2011.

- Chair of Animal Damage Management Session, The Wildlife Society, Annual Meeting, Reno, Nevada, September 26, 2001.

- Chair of Technical Session: Human communities and ecosystem health: Comparing perspectives and making connection. Managing for Ecosystem Health, International Congress on Ecosystem Health, Sacramento, CA August 15-20, 1999.

- Student Awards Committee, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

- Student Mentor, Annual Meeting of the Western Section of The Wildlife Society, Riverside, CA, January, 2000.

Printed Mass Media

Smallwood, K.S., D. Mooney, and M. McGuinness. 2003. We must stop the UCD biolab now. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2002. Spring Lake threatens Davis. Op-Ed to the Davis Enterprise.

Smallwood, K.S. Summer, 2001. Mitigation of habitation. The Flatlander, Davis, California.

Entrikan, R.K. and K.S. Smallwood. 2000. Measure O: Flawed law would lock in new taxes. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 2000. Davis delegation lobbies Congress for Wildlife conservation. Op-Ed to the Davis Enterprise.

Smallwood, K.S. 1998. Davis Visions. The Flatlander, Davis, California.

Smallwood, K.S. 1997. Last grab for Yolo's land and water. The Flatlander, Davis, California.

Smallwood, K.S. 1997. The Yolo County HCP. Op-Ed to the Davis Enterprise.

Radio/Television

PBS News Hour,

FOX News, Energy in America: Dead Birds Unintended Consequence of Wind Power

Development, August 2011.

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Mountain lion attacks (with guest Professor Richard Coss). 23 April 2009;

KXJZ Capital Public Radio -- Insight (Host Jeffrey Callison). Wind farm Rio Vista Renewable Power. 4 September 2008;

KQED QUEST Episode #111. Bird collisions with wind turbines. 2007;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. December 27, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. May 3, 2001;

KDVS Speaking in Tongues (host Ron Glick), Yolo County HCP: 1 hour. February 8, 2001;

KDVS Speaking in Tongues (host Ron Glick & Shawn Smallwood), California Energy Crisis: 1 hour. Jan. 25, 2001;

KDVS Speaking in Tongues (host Ron Glick), Headwaters Forest HCP: 1 hour. 1998;

Davis Cable Channel (host Gerald Heffernon), Burrowing owls in Davis: half hour. June, 2000;

Davis Cable Channel (hosted by Davis League of Women Voters), Measure O debate: 1 hour. October, 2000;

KXTV 10, In Your Interest, The Endangered Species Act: half hour. 1997.

Committees

- Scientific Review Committee, Alameda County, Altamont Pass Wind Resource Area
- Ph.D. Thesis Committee, Steve Anderson, University of California, Davis
- MS Thesis Committee, Marcus Yee, California State University, Sacramento

Other Professional Activities or Products

Testified in Federal Court in Denver during 2005 over the fate of radio-nuclides in the soil at Rocky Flats Plant after exposure to burrowing animals. My clients won a judgment of $553,000,000. I have also testified in many other cases of litigation under CEQA, NEPA, the Warren-Alquist Act, and other environmental laws. My clients won most of the cases for which I testified.

Testified before Environmental Review Tribunals in Ontario, Canada regarding proposed White Pines, Amherst Island, and Fairview Wind Energy projects.

Testified in Skamania County Hearing in 2009 on the potential impacts of zoning the County for development of wind farms and hazardous waste facilities.

Testified in deposition in 2007 in the case of O'Dell et al. vs. FPL Energy in Houston, Texas.

Testified in Klickitat County Hearing in 2006 on the potential impacts of the Windy Point Wind Farm.

Memberships in Professional Societies

The Wildlife Society
Raptor Research Foundation

Honors and Awards

Fulbright Research Fellowship to Indonesia, 1987
J.G. Boswell Full Academic Scholarship, 1981 college of choice
Certificate of Appreciation, The Wildlife Society—Western Section, 2000, 2001
Northern California Athletic Association Most Valuable Cross Country Runner, 1984
American Legion Award, Corcoran High School, 1981, and John Muir Junior High, 1977
CIF Section Champion, Cross Country in 1978
CIF Section Champion, Track & Field 2 mile run in 1981
National Junior Record, 20 kilometer run, 1982
National Age Group Record, 1500 meter run, 1978

Community Activities

District 64 Little League Umpire, 2003-2007
Dixon Little League Umpire, 2006-07
Davis Little League Chief Umpire and Board member, 2004-2005
Davis Little League Safety Officer, 2004-2005
Davis Little League Certified Umpire, 2002-2004
Davis Little League Scorekeeper, 2002
Davis Visioning Group member
Petitioner for Writ of Mandate under the California Environmental Quality Act against City of Woodland decision to approve the Spring Lake Specific Plan, 2002
Served on campaign committees for City Council candidates