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Response to Appendix AA regarding impacts to bighorn sheep

Additional submitted attachment is included below.

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4/8/2025

**Re: Soda Mountain Solar Docket #: 24-OPT-03 Potential Impacts to Biological Resources,
Document: Appendix AA_Determination of Infeasibility for DR BIO-20**

To representatives of the California Energy Commission:

We are writing in response to document **Appendix AA_Determination of Infeasibility for DR BIO-20**, as it calls into question our previously submitted assessment of project impacts to desert bighorn sheep. We wish to correct some inaccurate statements made in Appendix AA and respond to certain claims made regarding the project's potential impact to desert bighorn in light of our extensive research on the species and broader mammalian ecology and conservation biology.

First, we would like to address inaccurate statements made in section 4. Environmental Factors. The letter claims that our impact assessment is based on a "project-specific modeling simulation that has not undergone peer review." This is not accurate – the maps and descriptions of bighorn habitat use presented in our assessment were from modeling and simulation fully described and peer reviewed in [Aiello et al. \(2023\)](#). We did not conduct any additional simulation beyond that described in the "Landscape Ecology" paper, we merely subset the results from that paper to focus on the specific region relevant to the Soda Mountain Solar project. The letter also claims that Appendix D2 Desert Bighorn Sheep Study "performed wildlife linkage and connectivity modeling", which also is not accurate. Appendix D2 describes the results of linkage and connectivity modeling efforts previously conducted by other researchers, but the authors did not conduct any such analysis themselves. We note that the two wildlife linkage maps described in Appendix D2 (Figures 5 & 6) are based on models that pre-dated the extensive GPS collaring efforts and research undertaken to understand bighorn movement and connectivity in the region that was thoroughly described in our assessment.

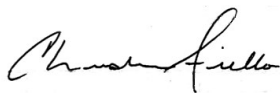
Second, we wish to provide biologically-supported counter arguments to statements made that suggest the project impacts to bighorn sheep would be "less than significant". The letter claims on numerous occasions that "there is insufficient evidence" to support that a 0.25 mi buffer would lessen the project's impacts. We posit that there is ample evidence to support **the 1.24 mi buffer** we submitted. The information presented in Appendix D2 and in our assessment, as well as in the broader conservation literature indicate that bighorn sheep do perceive certain human disturbances as a threat to be avoided and that buffers between wildlife habitat and human infrastructure are a reasonable approach to reduce impacts to wildlife. [Torres et al. \(2016\)](#), conducted a large-scale assessment across Europe and within Spain showing that wildlife abundance is often lower in areas immediately adjacent to various types of human infrastructure. The area adjacent to human activity and development that experiences indirect effects on wildlife presence and behavior is often referred to as an area or zone of influence – and is a widely accepted concept in conservation biology. By increasing the buffer between bighorn-used areas and the project footprint and expected human activity at the site, the project would reduce the likelihood that its zone of influence includes suitable habitat for bighorn and the key movement corridors for these populations. How far the zone of influence extends depends on various circumstances as well as species-specific behaviors – we used our peer-reviewed estimate of bighorn use of the surrounding habitat, previously documented visual range of the species, and observed responses of other ungulate species to similar developments, to estimate a buffer distance that would protect the most important of these behaviors. Reductions or loss of bighorn activity in these areas could compromise bighorn conservation goals.

Appendix AA suggests that both recommended buffers (0.25 or 1.24 mi) between the project and sloped habitat are disproportionate requests given their interpretation of expected impacts to bighorn sheep. They point to the small percentage of GPS points that fell within the project footprint as evidence of this point. We made clear in our assessment, however, that the available GPS data represents a small proportion of the bighorn movement actually happening on the landscape, that bighorn can perceive and react to disturbances from a distance, and that important resources that affect the health and performance of a population may not always be used with great frequency or regularity. Take for example, the water sources within the Soda Mountains that this population relies on. Only **1%** of the 118,423 Soda Mountain GPS points analyzed in Aiello et al. (2023) fell within 0.25 mi of water sources in the Soda Mountains. If we were to assume that the frequency of GPS points at a location were an indication of a resource's importance, we might recommend that the water source was insignificant. Appropriate interpretation and analysis of bighorn GPS data does identify these water sources as important, which is why we do not recommend the use of raw GPS point patterns alone to assess habitat needs. Bighorn sheep rely on many resources that are used intermittently (e.g. seasonal forage, mineral licks, water sources), which sometimes fall outside of preferred rugged terrain. Appendix AA equates frequent use with habitat value: *"The project site is primarily flat...it is unlikely that the onsite habitat would experience frequent and heavy use by desert bighorn sheep,"* which, in our expert opinion, is a narrow view of habitat value and does not reflect the comprehensive needs of desert bighorn sheep.

In our assessment we also indicated that the greatest impacts of this project would result from disturbance of bighorn behaviors adjacent to the project, which could occur irrespective of the amount of habitat used within the footprint. It is the regional benefits that could result from continued persistence of this population, its connectivity to adjacent populations, and the success of the wildlife overpass that make the 1.24 mi buffer request not only proportional, but also necessary to mitigate to less than significant when combined with the recommended sequencing of construction as noted in our initial submittal. These expected benefits are based on extensive large-scale analyses of bighorn connectivity and gene flow in this region, and the efforts to restore this connectivity have involved a massive investment by the state. Appendix AA suggests that the proposed mitigation measures would reduce the project impacts to "less than significant". The only mitigation measure that attempts to address the possible indirect disturbance of bighorn adjacent to the project site would be MM-BIO-24. Limited Operating Period. This measure would attempt to reduce noises of a certain decibel level within 500 m of 10% slope, except when they are necessary and in those cases, to coordinate with CDFW to determine if any bighorn are nearby. Since CDFW only ever has a small percentage of the population collared, they would not be able to determine the location of all bighorn. This measure does little to address the possible threat posed to bighorn by the project's current proximity to habitat and clear visibility from highly used areas. Discovery and use of the new overpass will rely on bighorn in the Soda Mountains feeling unthreatened and willing to explore beyond their regularly-used habitat to locate and use the overpass. We believe the construction and activity associated with this project could compromise this process.

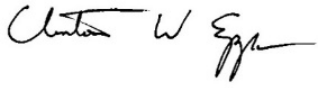
Unfortunately, much of the data we now have about bighorn sheep movement, habitat use, and connectivity in this region was being collected or yet-to-be collected at the time the DRECP was drafted, reviewed, and adopted. The designation of this area as a suitable solar zone that avoids ecological impacts would likely have been questioned if these data were available at the time of the DRECP's creation. As leading desert bighorn sheep experts, we hope the CEC will take into consideration the information we have presented in our assessment.

Sincerely,

A handwritten signature in black ink, appearing to read 'Christina Aiello', with a stylized, flowing script.

Christina Aiello, Ph.D.

Research Associate, Department of Fisheries, Wildlife, and Conservation Sciences
Oregon State University

A handwritten signature in black ink, reading "Clinton W. Epps". The signature is written in a cursive, flowing style with a long horizontal line extending from the end.

Clinton W. Epps, Ph.D.
Professor, Department of Fisheries, Wildlife, and Conservation Sciences
Oregon State University