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June 11, 2010

DOCKET	
09-AFC-6	
DATE	<u>JUN 11 2010</u>
RECD.	<u>JUN 11 2010</u>

California Energy Commission
Attn: Docket No. 09AFC6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

Re: 09-AFC-6 Blythe Solar Power Plant Project

Dear Docket Clerk:

Enclosed are an original and one copy of **TESTIMONY OF VERNON C. BLEICH ON BEHALF OF CALIFORNIA UNIONS FOR RELIABLE ENERGY FOR THE BLYTHE SOLAR POWER PROJECT**. Please process the document and provide us with a conformed copy in the envelope provided.

Thank you.

Sincerely,

/s/

Elizabeth Klebaner

EK:bh
Enclosures

STATE OF CALIFORNIA
California Energy Commission

In the Matter of:

The Application for Certification for the
Blythe Solar Power Project

Docket No. 09-AFC-6

TESTIMONY OF VERNON C. BLEICH
ON BEHALF OF CALIFORNIA UNIONS FOR RELIABLE ENERGY
FOR THE BLYTHE SOLAR POWER PROJECT

June 11, 2010

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RELIABLE ENERGY

I. Introduction

I have reviewed those documents that address evidence of mule deer and bighorn sheep on or near the property proposed for the development of the project known as the Blythe Solar Power Project (“Project”) in eastern Riverside County. It is my opinion that the aforementioned documents have inadequately portrayed the potential importance of the location to two species of large mammals, bighorn sheep and mule deer, that occur in the area. Further, they have not addressed the impacts of the Project in the context of a potential effort to reestablish pronghorn in a geographic area that evidence indicates formerly was occupied by that species. My *curriculum vitae* is attached as Attachment 1.

My critique centers on three primary areas of concern. (1) The absence of more recent information that enhances the probability of bighorn sheep occupying the McCoy Mountains and the Project site; (2) the importance of wash habitat as a seasonal foraging area that provides high-quality nutrients during certain periods of the year; and (3) impacts to movement corridors that might be used by bighorn sheep traveling to or from the McCoy Mountains. It is my opinion that the Project has similar negative implications for mule deer inhabiting eastern Riverside County, and dismissal of impacts to that species as insignificant is not appropriate.

II. The potential for bighorn sheep to occur in the McCoy Mountains and to use the Project site

The SA acknowledges the potential for bighorn sheep to be impacted by the Project, and recommends that Applicant develop a single water source in the McCoy Mountains.¹ Staff stipulated that the Applicant shall provide mitigation in the form of a wildlife water development at an, as yet, undetermined location in the McCoy Mountains.²

The argument that mitigation is not necessary would be based on the uncertainty associated with distinguishing between the tracks of bighorn sheep and mule deer and, in part, on the uncertainty associated with distinguishing between the scat of those species.³ Such argument would appear to have a basis in the Applicant’s statement that, “[t]he status of bighorn sheep in the Project area is not well understood.”⁴ The initial part of my testimony relates to better understanding of the distribution and presence of bighorn sheep in the vicinity of the Project area given the recent availability of information not included in the Revised Staff Assessment or provided by the Applicant.

The Applicant noted “... a paper published in the 2007 issue of the Transactions of the Desert Bighorn Council...”⁵ and cited it as evidence that desert ranges in the vicinity of Blythe may no longer be occupied by bighorn sheep; the citation for that paper

¹ Staff Assessment/Environmental Impact Statement, p. C.2-145.

² Staff Assessment/Environmental Impact Statement, p. C.2-145.

³ See Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, pp. BIO-47 - BIO-48.

⁴ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

⁵ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

is not provided, but it is my assumption that the paper in question is that of Bleich and Weaver (2007).⁶ Not all of the information provided by Bleich and Weaver (2007) was fully conveyed in the Applicant's response to CEC Staff Data Request DR-BIO-54.⁷ Bleich and Weaver (1977) cited Weaver (1957)⁸ for documentation that during the 1950s the mountain ranges in the vicinity of Blythe [the majority of which surround the Project site]⁹ were reported to "have some sheep in them some of the time." Weaver (1957) did note, however, that those mountain ranges *may* not have had sheep in them at the time he wrote his paper.

Weaver and Mensch (1971)¹⁰ concluded that bighorn sheep did not occupy the Little Maria or McCoy mountains at the time of their survey, but described occupancy of the Big Maria Mountains by bighorn sheep as being "transient." *Based on that information and a lack of data to the contrary*, Epps et al. (2003)¹¹ assumed that bighorn sheep had been extirpated from the Big Maria, Little Maria, Riverside, and McCoy mountains, and the Applicant concluded that, "[a]s of 2003, no new data exists [*sic*] about the status of bighorn sheep in the McCoy, Little and Big Maria Mountains and the bighorn sheep populations in these ranges are considered extirpated..."¹² New information, however, has become available, and must be considered in the context of potential impacts to bighorn sheep resulting from development of this Project.

During 2009, it became apparent that bighorn sheep were present in the Little Maria Mountains, located north of the Project site, and there is evidence of their presence over an extended period of time.^{13,14} The presence of bighorn sheep in the Little Maria Mountains has also been confirmed by another highly qualified investigator, who also noted evidence of lambs in that range and, further, used DNA derived from fresh fecal material (scat) to confirm occupancy of that range by bighorn sheep.¹⁵ Evidence that reproduction is occurring in the Little Maria Mountains is very significant, because

⁶ Bleich, V. C., and R. A. Weaver. 2007. Status of mountain sheep in California: comparisons between 1957 and 2007. *Desert Bighorn Council Transactions* 49:55-67.

⁷ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

⁸ Weaver, R. A. 1957. Status of the bighorn sheep in California. *Desert Bighorn Council Transactions* 1:8-11.

⁹ Among these ranges are the Big Maria, Little Maria, Riverside, and McCoy mountains north of Interstate Highway 10, and the Chuckwalla, Little Chuckwalla, and Mule mountains south of Interstate Highway 10.

¹⁰ Weaver, R. A., and J. L. Mensch. 1971. Bighorn sheep in northeastern Riverside County. *Wildlife Management Administrative Report* 71-1. Wildlife Management Branch, California Department of Fish and Game, Sacramento, USA.

¹¹ Epps, C. W., V. C. Bleich, J. D. Wehausen, and S. G. Torres. 2003. Status of bighorn sheep in California. *Desert Bighorn Council Transactions* 47:20-35.

¹² Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

¹³ G. W. Sudmeier, Society for the Conservation of Bighorn Sheep, personal communication on 1 June 2010.

¹⁴ Mr. Sudmeier, although a layman, has extensive knowledge of bighorn sheep, habitat characteristics, and evidence of their presence based on more than 45 years of experience working with those animals in the deserts of southeastern California.

¹⁵ J. D. Wehausen, University of California White Mountain Research Station, personal communication on 2 June 2010.

female bighorn sheep are extremely conservative in their behavior¹⁶ and colonization events among desert sheep are rarely detected and not often recorded;¹⁷ further, colonization events may occur more frequently than previously recognized.¹⁸ Staff acknowledged some of the aforementioned new information in the Revised Staff Assessment¹⁹ but, for reasons unknown, failed to emphasize the presence of lambs in the Little Maria Mountains despite previously citing a memo²⁰ that provided that information.²¹ In the SA/DEIS, Staff noted only that, “[r]ecent surveys also suggest bighorn sheep *may* [emphasis added] occur in the Little Maria Mountains (Wehausen 2009).”²² Unfortunately, the Revised Staff Assessment does not mention the presence of lambs in the Little Maria Mountains; this remains an important oversight because, as previously noted, bighorn sheep were considered to have been extirpated from that range, and it raises the spectre of bighorn sheep occupancy of the McCoy Mountains, and Staff’s conclusion that they do not exist in the McCoy Mountains is open to question.

Staff also acknowledges the presence of bighorn sheep in the Granite and Palen mountains, located west and northwest of the McCoy Mountains, respectively, and notes that the McCoy Mountains are within a bighorn sheep Wildlife Habitat Management Area that was identified in the Bureau of Land Management’s Northern and Eastern Colorado Desert Plan.

The Applicant notes that the Project area was searched for evidence of bighorn sheep, but concluded that evidence obtained in the form of scat more likely was deposited by mule deer than by bighorn sheep. In the absence of supporting information, Staff concluded that it was unlikely that bighorn sheep currently use the Project site and McCoy Mountains.²³ I contend that, in the absence of definitive information to the contrary, it was inappropriate for Staff to conclude that bighorn sheep do not occupy the McCoy Mountains and, at least upon occasion, the adjacent Project area; it is always better to err on the conservative side of such issues. Rigorous application of the precautionary principle is warranted in this situation: in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is *not* harmful falls on those taking the action.²⁴

¹⁶ Geist, V. 1970. Mountain sheep. A study in ecology and evolution. University of Chicago Press, Chicago, Illinois.

¹⁷ Bleich, V. C., J. D. Wehausen, R. R. Ramey II, and J. L. Rechel. 1996. Metapopulation theory and mountain sheep: implications for conservation. Pp. 353-373 in D. R. McCullough (editor). Metapopulations and wildlife conservation. Island Press, Covelo, California.

¹⁸ Epps, C. W., J. D. Wehausen, P. J. Palsbøll, and D. R. McCullough. 2005. Using genetic methods to describe and infer recent colonizations by desert bighorn sheep. Pp. 51-62 in Goerrissen, J., and J. M. Andre, editors. Symposium Proceedings for the Sweeney Granite Mountains Desert Research Center 1978-2003: A quarter century of research and teaching. University of California, Riverside.

¹⁹ Revised Staff Assessment, p. C-2-38.

²⁰ SA/DEIS, p. C-2-36.

²¹ Unpublished memo from J. D. Wehausen to various files entitled, "Investigation of Little Maria Mountains relative to bighorn sheep occupancy" and dated 11 December 2009.

²² Staff EA/DEIS, p. C-2-36.

²³ Staff EA/DEIS, p. C-2-36.

²⁴ http://en.wikipedia.org/wiki/Precautionary_principle.

My purpose is not to denigrate those that contributed to the Revised Staff Assessment but, rather, to raise as an issue the probability of bighorn sheep inhabiting the McCoy Mountains instead of simply dismissing their presence as unlikely. Indeed, there is evidence to suggest that bighorn sheep have a much greater probability of occurring in the McCoy Mountains than is acknowledged in the Revised Staff Assessment.

For example, bighorn sheep were listed by Epps et al. (2003)²⁵ as extirpated not only from the McCoy Mountains, but also from the Big Maria, Little Maria, and Riverside Mountains, which largely surround the McCoy Mountains. As described earlier, the presence of bighorn sheep in the Little Maria Mountains has since been confirmed.^{26, 27} Additionally, bighorn sheep were observed in the McCoy Mountains within the last 10 to 15 years.²⁸ Moreover, a bighorn sheep was killed by a motorist midway between the Riverside and Big Maria Mountains in November 2009, and its carcass was examined by personnel from the California Department of Fish and Game.²⁹ Further, the Iron Mountains, located northwest of the Little Maria Mountains and the McCoy Mountains, have been colonized recently by bighorn sheep.³⁰ These events suggest that there is greater potential for bighorn sheep to recolonize the mountains around Blythe than that assumed by the Applicant.³¹

The results of recent aerial surveys also are consistent with the potential for bighorn sheep to have recolonized the McCoy Mountains. Those surveys confirmed the presence of bighorn sheep of both sexes, as well as young, in the Chuckwalla Mountains and Little Chuckwalla Mountains (located south of Interstate Highway 10), in the Granite and Palen Mountains, and in the Coxcomb Mountains.³² All of those areas, and even occupied areas further removed from the McCoy Mountains, could be sources of dispersing bighorn sheep given the vagility of those ungulates and their ability to move across areas not normally recognized as being bighorn sheep habitat (i.e., intermountain areas with little topographic relief).^{33, 34, 35}

²⁵ Epps, C. W., V. C. Bleich, J. D. Wehausen, and S. G. Torres. 2003. Status of bighorn sheep in California. *Desert Bighorn Council Transactions* 47:20-35.

²⁶ G. W. Sudmeier, Society for the Conservation of Bighorn Sheep, personal communication on 1 June 2010.

²⁷ Unpublished memo from J. D. Wehausen to various files entitled, Investigation of Little Maria Mountains relative to bighorn sheep occupancy and dated 11 December 2009.

²⁸ Lt. Richard Colby, of the California Department of Fish and Game (and now deceased) observed two young male bighorn sheep on the east side of the McCoy Mountains approximately 500 yards north of Interstate Highway 10 (G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010).

²⁹ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.

³⁰ Epps, C. W., J. D. Wehausen, P. J. Palsbøll, and D. R. McCullough. 2005. Using genetic methods to describe and infer recent colonizations by desert bighorn sheep. Pp. 51-62 in Goerrissen, J., and J. M. Andre, editors. *Symposium Proceedings for the Sweeney Granite Mountains Desert Research Center 1978-2003: A quarter century of research and teaching*. University of California, Riverside.

³¹ See Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

³² G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.

³³ Bleich, V. C., J. D. Wehausen, and S. A. Holl. 1990. Desert-dwelling mountain sheep: conservation implications of a naturally fragmented distribution. *Conservation Biology* 4:383-390.

Observations of bighorn sheep were recorded opportunistically during recent flights to determine the presence of Golden Eagle aeries in the vicinity of the proposed project.³⁶ In my extensive experience, and in that of the majority of professional wildlife biologists with whom I have worked for more than three decades, bighorn sheep and other large mammals are difficult to see from the air, even by skilled and experienced observers conducting surveys focused exclusively on large ungulates. Indeed, research on this topic has demonstrated that many factors affect visibility, and that a large proportion of animals available to be seen during any given survey generally is missed.³⁷ In my opinion, it is probable that far more sheep occupy those mountain ranges than were actually observed. Moreover, the probability of bighorn sheep occurring in the McCoy Mountains is enhanced by the aforementioned observation of young males in that range, the fact that a bighorn sheep was killed midway between the Big Maria and Riverside Mountains less than 6 months ago,^{38, 39} the heretofore unrecognized presence of bighorn sheep in the Little Maria Mountains,^{40, 41, 42, 43} and the presence of bighorn sheep, including males, females, and young, in other mountain ranges in the vicinity of the McCoy Mountains.⁴⁴

The observations reported above, including those of bighorn sheep in nearby mountain ranges, counter the Applicant's assertion that the probability that bighorn sheep occupy the McCoy Mountains, at least on a seasonal basis, is low. Indeed, bighorn sheep likely move between or among those mountain ranges while attempting to meet their nutritional needs and other life history requirements.^{45, 46} Such movements would be consistent with a strategy that allows bighorn sheep to take advantage of nutrient availability, meet water demands, and provide for protection of offspring, depending on

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- ³⁴ Bleich, V. C., J. D. Wehausen, R. R. Ramey II, and J. L. Rechel. 1996. Metapopulation theory and mountain sheep: implications for conservation. Pp. 353-373 in D. R. McCullough (editor). *Metapopulations and wildlife conservation*. Island Press, Covelo, California.
- ³⁵ Epps, C. W., J. D. Wehausen, V. C. Bleich, S. G. Torres, and J. S. Brashares. 2007. Optimizing dispersal and corridor models using landscape genetics. *Journal of Applied Ecology* 44:714-724.
- ³⁶ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.
- ³⁷ See Bleich, V. C., C. S. Y. Chun, R. W. Anthes, T. E. Evans, and J. K. Fischer. 2001. Visibility bias and development of a sightability model for tule elk. *Alces* 37:315-327, and references therein.
- ³⁸ Lt. Richard Colby, of the California Department of Fish and Game (and now deceased) observed two young male bighorn sheep on the east side of the McCoy Mountains approximately 500 yards north of Interstate Highway 10 (G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010).
- ³⁹ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.
- ⁴⁰ G. W. Sudmeier, Society for the Conservation of Bighorn Sheep, personal communication on 1 June 2010.
- ⁴¹ J. D. Wehausen, University of California White Mountain Research Station, personal communication on 2 June 2010.
- ⁴² G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.
- ⁴³ Unpublished memo from J. D. Wehausen to various files entitled, Investigation of Little Maria Mountains relative to bighorn sheep occupancy and dated 11 December 2009.
- ⁴⁴ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.
- ⁴⁵ G. W. Sudmeier, Society for the Conservation of Bighorn Sheep, personal communication on 1 June 2010.
- ⁴⁶ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.

the seasonal availability or need for those resources. Similar strategies have been demonstrated among bighorn sheep elsewhere in California, where bighorn sheep move long distances in response to changing environmental conditions.^{47, 48} The ability of bighorn sheep to move between and among mountain ranges is well established, and increasing evidence suggests that bighorn sheep are capable of moving long distances, and that they do move long distances, across seemingly unsuitable areas between the stereotypical habitats (i.e., steep and rugged terrain) with which they normally are associated.^{49, 50, 51, 52} Thus, it is unclear why Staff would cite discussions with L. LaPre⁵³ to substantiate their conclusion that the Project site, due to the width of the valley in which the solar facility would be located, has limited value as a movement corridor.

The area in the vicinity of the Project site is very arid, and total rainfall is low and very seasonal.^{54, 55} Additionally, surface water is very limited,⁵⁶ and its importance to bighorn sheep varies seasonally.⁵⁷ The assertion that no permanent water source exists near the Project site⁵⁸ is irrelevant, as bighorn sheep are dependent upon surface water during the hottest periods of the year but can meet water demands through forage intake during cooler periods.⁵⁹ Further, the nutritional value of forage also varies seasonally, and is affected demonstrably by rainfall.⁶⁰ Thus, use of the Project area by bighorn sheep

⁴⁷ Jaeger, J. R. 1994. Demography and movements of mountain sheep in the Kingston and Clark mountain ranges, California. M.S. thesis, University of Nevada, Las Vegas.

⁴⁸ Thompson, D. B., K. Longshore, and C. Lowery. 2007. The impact of human disturbance on desert bighorn sheep (*Ovis canadensis nelsoni*) in the Wonderland of Rocks/Queen Mountain region of Joshua Tree National Park, California. Final report submitted to Joshua Tree National Park. Department of Biological Sciences, University of Nevada, Las Vegas.

⁴⁹ Schwartz, O. A., V. C. Bleich, and S. A. Holl. 1986. Genetics and the conservation of mountain sheep *Ovis canadensis nelsoni*. *Biological Conservation* 37:179-190.

⁵⁰ Bleich, V. C., J. D. Wehausen, and S. A. Holl. 1990. Desert-dwelling mountain sheep: conservation implications of a naturally fragmented distribution. *Conservation Biology* 4:383-390.

⁵¹ Bleich, V. C., J. D. Wehausen, R. R. Ramey II, and J. L. Rechel. 1996. Metapopulation theory and mountain sheep: implications for conservation. Pp. 353-373 in D. R. McCullough (editor). *Metapopulations and wildlife conservation*. Island Press, Covelo, California.

⁵² Epps, C. W., J. D. Wehausen, V. C. Bleich, S. G. Torres, and J. S. Brashares. 2007. Optimizing dispersal and corridor models using landscape genetics. *Journal of Applied Ecology* 44:714-724.

⁵³ Revised Staff Assessment, p. C-2-75.

⁵⁴ J. D. Wehausen, University of California White Mountain Research Station, personal communication on 2 June 2010.

⁵⁵ Bleich, V. C., J. P. Marshal, and N. G. Andrew. 2010. Habitat use by a desert ungulate: predicting effects of water availability on mountain sheep. *Journal of Arid Environments* 74:638-645.

⁵⁶ Weaver, R. A., and J. L. Mensch. 1971. Bighorn sheep in northeastern Riverside County. *Wildlife Management Administrative Report 71-1*. Wildlife Management Branch, California Department of Fish and Game, Sacramento, USA.

⁵⁷ Turner, J. C. 1973. Water, energy and electrolyte balance in the desert bighorn sheep, *Ovis canadensis*. Ph.D. Thesis, Univ. California, Riverside.

⁵⁸ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

⁵⁹ Turner, J. C. 1973. Water, energy and electrolyte balance in the desert bighorn sheep, *Ovis canadensis*. Ph.D. Thesis, Univ. California, Riverside.

⁶⁰ Wehausen, J. D. 2005. Nutrient predictability, birthing seasons, and lamb recruitment for desert bighorn sheep. Pp. 37-50 in J. Goerrissen and J. M. Andre, editors. *Sweeney Granite Mountains Desert Research Center 1978-2003. A Quarter Century of Research and Teaching*. University of California Natural Reserve System, Riverside, California, USA.

cannot be ruled out merely because the area lacks surface water and has low precipitation.

A strategy that employs long-distance movements among areas of stereotypical bighorn sheep habitat, but that allows bighorn sheep to meet their life history requirements (i.e., nutrient intake, water balance, and protection for offspring), is consistent with the notion that bighorn in the vicinity of the Project site may not be permanent residents of specific geographic areas but, instead, persist (albeit at low densities) as a result of their ability to move long distances to meet their needs. For example, female bighorn sheep select those areas that are safest, or present the fewest risks, to bear and rear lambs, but dependence on surface water can be slight during the birthing season if ambient temperatures are not extreme and forage quality is high.⁶¹ Females and offspring tend to occupy areas closer to surface water as temperatures increase and, concomitantly, nutritional value of forage declines.⁶² It is improbable that all of the life-history requirements of bighorn sheep can be met in a single geographic area and, in particular, in the vicinity of the Project site given the sparse rainfall and general absence of surface water noted previously. However, it is probable that the site provides high quality forage following periods of adequate precipitation.^{63, 64}

In the absence of data to the contrary and in light of recent information, it is reasonable to assume that the McCoy Mountains support, or at least are capable of supporting, bighorn sheep for short periods during critically important phases of their life history. A conclusion that the McCoy Mountains are not occupied by bighorn sheep is overly simplistic and scientifically unsound. Further, a conclusion that bighorn sheep would not use the Project area "... as a regular part of their home range"⁶⁵ is spurious, as the scale at which the home range is defined would have a profound influence on whether or not the Project site would be used. Among animals that move long distances across the landscape, as may those bighorn sheep occupying eastern Riverside County, the annual home range could encompass multiple mountain ranges, and it is logical to assume that bighorn sheep occupy those ranges as they seek to meet their life history requirements.

⁶¹ Bleich, V. C., R. T. Bowyer, and J. D. Wehausen. 1997. Sexual segregation in mountain sheep: resources or predation? *Wildlife Monographs* 134:1-50.

⁶² Bleich, V. C., R. T. Bowyer, and J. D. Wehausen. 1997. Sexual segregation in mountain sheep: resources or predation? *Wildlife Monographs* 134:1-50.

⁶³ Marshal, J. P., P. R. Krausman, and V. C. Bleich. 2005. Dynamics of mule deer forage in the Sonoran Desert. *Journal of Arid Environments* 60:593-609.

⁶⁴ Marshal, J. P., P. R. Krausman, and V. C. Bleich. 2005. Rainfall, temperature, and forage dynamics affect nutritional quality of desert mule deer forage. *Rangeland Ecology and Management* 58:360-365.

⁶⁵ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

III. Low elevation wash habitat is an important source of nutrients to bighorn sheep inhabiting desert environments, the loss of which has potentially significant impacts to the reproductive performance, recruitment rates, and persistence of subpopulations of the bighorn sheep

In meeting the aforementioned life history requirements, bighorn sheep are dependent upon and take advantage of “wash vegetation” during certain seasons, particularly when new annual growth and production of perennial species is greatest.⁶⁶ Low lying areas and, in particular desert washes, are among the most productive habitats in the Sonoran Desert and support higher cover of vegetation and far greater plant biomass than surrounding upland areas.^{67,68} Although such areas likely are not used on a year-round basis, they are at times critically important to bighorn sheep in terms of nutrient acquisition, and the acquisition of nutrients packaged in the form of newly emergent or actively growing vegetation (which is high in moisture content, digestibility, and crude protein)⁶⁹ is critically important and can have a profound effect on reproductive performance.⁷⁰

Forages used by bighorn sheep in California reflect an increase in quality, with resultant increases in diet quality, during the growing season^{71, 72, 73, 74} and have important implications for the reproductive biology and recruitment rates of bighorn sheep in desert environments.⁷⁵ The Project area will be completely surrounded by a perimeter fence,⁷⁶

⁶⁶ Wehausen, J. D. 2005. Nutrient predictability, birthing seasons, and lamb recruitment for desert bighorn sheep. Pp. 37-50 in J. Goerrissen and J. M. Andre, editors. Sweeney Granite Mountains Desert Research Center 1978-2003. A Quarter Century of Research and Teaching. University of California Natural Reserve System, Riverside, California, USA.

⁶⁷ Andrew, N. G. 1994. Demography and habitat use of desert-dwelling mountain sheep in the East Chocolate Mountains, Imperial County, California. MS Thesis, University of Rhode Island, Kingston, Rhode Island, USA.

⁶⁸ Marshal, J. P., P. R. Krausman, and V. C. Bleich. 2005. Dynamics of mule deer forage in the Sonoran Desert. *Journal of Arid Environments* 60:593-609.

⁶⁹ Marshal, J. P., P. R. Krausman, and V. C. Bleich. 2005. Rainfall, temperature, and forage dynamics affect nutritional quality of desert mule deer forage. *Rangeland Ecology and Management* 58:360-365.

⁷⁰ White, R. G. 1983. Foraging patterns and their multiplier effect on productivity of northern ungulates. *Oikos* 40:377-384.

⁷¹ Bleich, V. C., R. T. Bowyer, D. J. Clark, and T. O. Clark. 1992. Quality of forages eaten by mountain sheep in the eastern Mojave Desert, California. *Desert Bighorn Council Transactions* 36:41-47.

⁷² Oehler, M. W., Sr., R. T. Bowyer, and V. C. Bleich. 2003. Home ranges of mountain sheep: effects of precipitation in a desert ecosystem. *Mammalia* 67:385-402.

⁷³ Oehler, M. W., V. C. Bleich, R. T. Bowyer, and M. C. Nicholson. 2005. Mountain sheep and mining: implications for conservation and management. *California Fish and Game* 91:149-178.

⁷⁴ Wehausen, J. D. 2005. Nutrient predictability, birthing seasons, and lamb recruitment for desert bighorn sheep. Pp. 37-50 in J. Goerrissen and J. M. Andre, editors. Sweeney Granite Mountains Desert Research Center 1978-2003. A Quarter Century of Research and Teaching. University of California Natural Reserve System, Riverside, California, USA.

⁷⁵ Wehausen, J. D. 2005. Nutrient predictability, birthing seasons, and lamb recruitment for desert bighorn sheep. Pp. 37-50 in J. Goerrissen and J. M. Andre (editors). Sweeney Granite Mountains Desert Research Center 1978-2003. A Quarter Century of Research and Teaching. University of California Natural Reserve System, Riverside, California, USA.

⁷⁶ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-51.

and will thereby deny access to potentially important forage resources currently available on the Project site. Low-lying areas, and particularly washes, are used by bighorn sheep for foraging, and such use may occur only for short periods of time but can play critically important roles in the life history of bighorn sheep, particularly during years when forage production is poor. Indeed, patterns and amounts of precipitation, and resultant productivity of vegetation,^{77,78} affect the distribution of bighorn sheep and, ultimately, the probability of persistence of populations of that species.⁷⁹ That ground surveys conducted during December did not reveal evidence of bighorn sheep at that time of the year is not surprising.⁸⁰ This expert appreciates the conclusion that the Applicant recognizes the potential for bighorn sheep to use the Project area and buffer for seasonal foraging, and recognition that those areas likely are not used as a "...regular part of their home range."⁸¹ Nevertheless, fencing the Project site will make areas that provide important forage resources to bighorn sheep during certain times of the year unavailable, and mitigation to *help* offset the loss of those resources is appropriate.

IV. Project implementation and fencing will result in potentially significant impacts to bighorn habitat connectivity in the South Mohave Metapopulation

It is not my purpose to question the credibility or intent of the Applicant's responses to Staff's inquiries but, rather, to again emphasize the importance of recently available information, this time in the context of potential for the Project to impact connectivity among areas that are utilized by bighorn sheep.

Applicant states that there is a low potential for bighorn sheep to exist in or recolonize the mountains around Blythe.^{82,83} That conclusion was reached, however, in the absence of knowledge of the presence of bighorn sheep (including lambs and, presumably, their mothers) in the Little Maria Mountains,^{84, 85, 86} an observation of two

⁷⁷ Marshal, J. P., P. R. Krausman, and V. C. Bleich. 2005. Rainfall, temperature, and forage dynamics affect nutritional quality of desert mule deer forage. *Rangeland Ecology and Management* 58:360-365.

⁷⁸ Wehausen, J. D. 2005. Nutrient predictability, birthing seasons, and lamb recruitment for desert bighorn sheep. Pp. 37-50 in J. Goerrissen and J. M. Andre (editors). *Sweeney Granite Mountains Desert Research Center 1978-2003. A Quarter Century of Research and Teaching*. University of California Natural Reserve System, Riverside, California, USA.

⁷⁹ Oehler, M. W., Sr., R. T. Bowyer, and V. C. Bleich. 2003. Home ranges of mountain sheep: effects of precipitation in a desert ecosystem. *Mammalia* 67:385-402.

⁸⁰ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

⁸¹ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

⁸² Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

⁸³ As noted previously, mountain ranges on the north side of Interstate Highway 10 include the McCoy, Big Maria, Little Maria, Riverside, Palen, Granite, and Coxcomb mountains; those south of Interstate Highway 10 include the Chuckwalla, Little Chuckwalla, and Mule mountains.

⁸⁴ G. W. Sudmeier, Society for the Conservation of Bighorn Sheep, personal communication on 1 June 2010.

⁸⁵ J. D. Wehausen, University of California White Mountain Research Station, personal communication on 2 June 2010.

⁸⁶ Unpublished memo from J. D. Wehausen to various files entitled, Investigation of Little Maria Mountains relative to bighorn sheep occupancy and dated 11 December 2009.

male bighorn sheep in the McCoy Mountains in the not-so-distant past,⁸⁷ and the accidental death of a male bighorn sheep midway between the Big Maria and Riverside mountains in November 2009.⁸⁸ This information, in fact, suggests that bighorn sheep do move between and among the “mountain ranges around Blythe,” contrary to the Applicant’s assertion that the potential for such to occur is low.⁸⁹ Moreover, recent observations of bighorn sheep in the Chuckwalla, Little Chuckwalla, Granite, Palen, and Coxcomb mountains⁹⁰ have demonstrated the continuing presence of bighorn sheep in those geographic areas, and each of those mountain ranges (which clearly are important to bighorn sheep) could be sources of dispersing animals with the potential to colonize the mountains around Blythe, as could the Eagle and Iron mountains, both of which also are occupied by bighorn sheep.⁹¹ The current presence of bighorn sheep in and around “... the mountains around Blythe” provides ample evidence that a source of potential colonists exists, and Applicant’s conclusion that, “... there is a low potential for bighorn sheep to exist or recolonize the mountains around Blythe” does not withstand scrutiny.

Bighorn sheep occur as subpopulations within metapopulations in the American southwest^{92 93 94 95} and the metapopulation with the largest potential number of subpopulations in California is termed the South Mojave Metapopulation.⁹⁶ Among the subpopulations that comprise the South Mojave Metapopulation are “...the mountain ranges around Blythe,” including the McCoy Mountains.^{97, 98, 99, 100} Metapopulation persistence is a function of colonization and extinction processes,¹⁰¹ both of which occur as a result of multiple factors. Metapopulation persistence is dependent upon the colonization rate being greater than the extinction rate among subpopulations comprising

⁸⁷ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.

⁸⁸ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.

⁸⁹ Response to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-50.

⁹⁰ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.

⁹¹ Epps, C. W., V. C. Bleich, J. D. Wehausen, and S. G. Torres. 2003. Status of bighorn sheep in California. *Desert Bighorn Council Transactions* 47:20-35.

⁹² Schwartz, O. A., V. C. Bleich, and S. A. Holl. 1986. Genetics and the conservation of mountain sheep *Ovis canadensis nelsoni*. *Biological Conservation* 37:179-190.

⁹³ Bleich, V. C., J. D. Wehausen, and S. A. Holl. 1990. Desert-dwelling mountain sheep: conservation implications of a naturally fragmented distribution. *Conservation Biology* 4:383-390.

⁹⁴ Bleich, V. C., J. D. Wehausen, R. R. Ramey II, and J. L. Rechel. 1996. Metapopulation theory and mountain sheep: implications for conservation. Pp. 353-373 in D. R. McCullough (editor). *Metapopulations and wildlife conservation*. Island Press, Covelo, California.

⁹⁵ Epps, C. W., J. D. Wehausen, V. C. Bleich, S. G. Torres, and J. S. Brashares. 2007. Optimizing dispersal and corridor models using landscape genetics. *Journal of Applied Ecology* 44:714-724.

⁹⁶ Epps, C. W., V. C. Bleich, J. D. Wehausen, and S. G. Torres. 2003. Status of bighorn sheep in California. *Desert Bighorn Council Transactions* 47:20-35.

⁹⁷ Bleich, V. C., J. D. Wehausen, and S. A. Holl. 1990. Desert-dwelling mountain sheep: conservation implications of a naturally fragmented distribution. *Conservation Biology* 4:383-390.

⁹⁸ Torres, S. G., V. C. Bleich, and J. D. Wehausen. 1994. Status of bighorn sheep in California, 1993. *Desert Bighorn Council Transactions* 38:17-28.

⁹⁹ Torres, S. G., V. C. Bleich, and J. D. Wehausen. 1996. Status of bighorn sheep in California - 1995. *Desert Bighorn Council Transactions* 40:27-34.

¹⁰⁰ Epps, C. W., J. D. Wehausen, V. C. Bleich, S. G. Torres, and J. S. Brashares. 2007. Optimizing dispersal and corridor models using landscape genetics. *Journal of Applied Ecology* 44:714-724.

¹⁰¹ Hanski, I. 1989. Metapopulation dynamics: does it help to have more of the same? *Trends in Ecology and Evolution* 4(4):113-114.

the metapopulation,¹⁰² as well as the number of habitat patches that are available for colonization.¹⁰³

It is also clear that geographic areas can be colonized by only a few dispersers and yet become large and productive subpopulations if resources are adequate, as has occurred elsewhere in California.¹⁰⁴ For example, a recent colonization of the South Bristol Mountain, possibly the result of exploratory movements by a single female with a home range that included the Marble Mountains, and the population of bighorn sheep in the South Bristol Mountains is now of substantial size.¹⁰⁵ Similarly, movements by bighorn sheep from the Old Woman Mountains to the Iron Mountains, both of which are part of the South Mojave Metapopulation,^{106, 107} has resulted in a population of bighorn sheep now inhabiting the Iron Mountains.^{108, 109} It is also clear that bighorn sheep can, and do, cross heavily traveled highways, and are capable of moving long distance through non-stereotypical bighorn sheep habitat, and in doing so can successfully cross heavily traveled roads and interstate highways.^{110, 111, 112}

Information that bighorn sheep have recently colonized the Iron Mountains, currently occupy the Little Maria Mountains, and (at least) attempt to travel between the Big Maria and Riverside Mountains provides ample evidence that the Project could significantly impact habitat connectivity for bighorn sheep in the South Mojave

¹⁰² Hanski, I., and M. Gilpin. 1991. Metapopulation dynamics: brief history and conceptual domain. *Biological Journal of the Linnean Society* 42:3-16.

¹⁰³ Hanski, I. 1989. Metapopulation dynamics: does it help to have more of the same? *Trends in Ecology and Evolution* 4(4):113-114.

¹⁰⁴ Epps, C. W., J. D. Wehausen, P. J. Palsbøll, and D. R. McCullough. 2005. Using genetic methods to describe and infer recent colonizations by desert bighorn sheep. Pp. 51-62 in Goerrissen, J., and J. M. Andre, editors. *Symposium Proceedings for the Sweeney Granite Mountains Desert Research Center 1978-2003: A quarter century of research and teaching*. University of California, Riverside.

¹⁰⁵ Epps, C. W., V. C. Bleich, J. D. Wehausen, and S. G. Torres. 2003. Status of bighorn sheep in California. *Desert Bighorn Council Transactions* 47:20-35.

¹⁰⁶ Torres, S. G., V. C. Bleich, and J. D. Wehausen. 1994. Status of bighorn sheep in California, 1993. *Desert Bighorn Council Transactions* 38:17-28.

¹⁰⁷ Torres, S. G., V. C. Bleich, and J. D. Wehausen. 1996. Status of bighorn sheep in California - 1995. *Desert Bighorn Council Transactions* 40:27-34.

¹⁰⁸ Epps, C. W., J. D. Wehausen, P. J. Palsbøll, and D. R. McCullough. 2005. Using genetic methods to describe and infer recent colonizations by desert bighorn sheep. Pp. 51-62 in Goerrissen, J., and J. M. Andre, editors. *Symposium Proceedings for the Sweeney Granite Mountains Desert Research Center 1978-2003: A quarter century of research and teaching*. University of California, Riverside.

¹⁰⁹ Epps, C. W., V. C. Bleich, J. D. Wehausen, and S. G. Torres. 2003. Status of bighorn sheep in California. *Desert Bighorn Council Transactions* 47:20-35.

¹¹⁰ Torres, S., G. Mulcahy, B. Gonzales, A. Pauli, and N. Andrew. 2000. Human induced migration and homing behavior of a desert bighorn ram in the Whipple mountains, California: or, herman, the trailer park ram. *Desert Bighorn Council Transactions* 44:13.

¹¹¹ Ough, W. C., and J. C. deVos, Jr. 1984. Intermountain travel corridors and their management implications for bighorn sheep. *Desert Bighorn Council Transactions* 28:32-36.

¹¹² Epps, C. W., J. D. Wehausen, V. C. Bleich, S. G. Torres, and J. S. Brashares. 2007. Optimizing dispersal and corridor models using landscape genetics. *Journal of Applied Ecology* 44:714-724.

Metapopulation. I concur with the opinions of other knowledgeable individuals^{113, 114} that bighorn sheep occupying extremely arid regions may be able to do so because they are able to move freely to travel widely to take advantage of seasonally available resources necessary to meet their life-history requirements. Bighorn sheep inhabiting other harsh and arid ecosystems, characteristics that aptly describe conditions in the vicinity of the proposed Project, have home ranges that averaged 22 square miles in size.¹¹⁵ Further, resources, including forage and water that are necessary for bighorn sheep to meet their life-history requirements, likely are more widely dispersed in eastern Riverside County, where the proposed Project is located, than even in the extremely arid Panamint Range studied by Oehler et al.¹¹⁶ Thus, consideration of home range size of bighorn sheep calculated in an environment that greatly differs from that near the Project site (i.e., west Texas)¹¹⁷ is inappropriate, and cannot be used as a rationale to dismiss the Project's impacts to habitat connectivity as insignificant.

The Project will result in the loss of more than 7,000 acres of wildlife habitat, much of it habitat that provides an important source of nutrients to bighorn sheep (and mule deer, another species of large mammalian herbivore occurring on and around the Project site and that is highly dependent upon wash habitat, but is largely ignored in the Revised Staff Assessment) on a seasonal basis. Further, the Project will potentially significantly disrupt movements by bighorn sheep in the Project area. Thus, mitigation to help offset those impacts is appropriate,¹¹⁸ although the type and anticipated benefits of the actual mitigation measure(s) are, as yet, unclear and must be considered carefully in context, design, and location prior to implementation.¹¹⁹

The Project's potentially significant impacts to Nelson's bighorn sheep habitat connectivity cannot be fully offset. However, the development of a man-made water source could partially offset these impacts, but careful consideration should be given to the location of any such man-made water source. Specifically, it is necessary to first identify whether there are one or more natural water sources that no longer are available to bighorn sheep that make use of the mountains near Blythe, but that would be of potential benefit to bighorn sheep in that region as a whole. If so, mitigation should include the renovation or redevelopment of such water source. Thus, before a final location or type of mitigation is agreed upon, careful consideration must be given to all options that would have a potentially positive impact on bighorn sheep in the Project area, rather than stipulating *a priori* that a water development be constructed and

¹¹³ G. W. Sudmeier, Society for the Conservation of Bighorn Sheep, personal communication on 1 June 2010.

¹¹⁴ G. P. Mulcahy, California Department of Fish and Game, personal communication on 2 June 2010.

¹¹⁵ Oehler, M. W., Sr., R. T. Bowyer, and V. C. Bleich. 2003. Home ranges of female mountain sheep, *Ovis canadensis nelsoni*: effects of precipitation in a desert ecosystem. *Mammalia* 67:385-401.

¹¹⁶ Oehler, M. W., Sr., R. T. Bowyer, and V. C. Bleich. 2003. Home ranges of female mountain sheep, *Ovis canadensis nelsoni*: effects of precipitation in a desert ecosystem. *Mammalia* 67:385-401.

¹¹⁷ See Responses to CEC Staff Data Request, Biological Resources AFC Section 5.3, p. BIO-51.

¹¹⁸ Staff Assessment/Environmental Impact Statement, p. C.2-145.

¹¹⁹ Unpublished letter from J. Aardahl (Defenders of Wildlife) to A. Solomon (California Energy Commission) dated 4 May 2010. Available at: http://www.energy.ca.gov/sitingcases/solar_millennium_blythe/documents/others/2010-05-04_Comment_Defenders_of_Wildlife_SA-DEIS_TN-56544.PDF.

maintained in a specific area. Lastly, any mitigation scheme must include a condition that requires monitoring and includes specific criteria to measure the efficacy of the mitigation to ensure that the accepted mitigation is achieving its intended purpose.

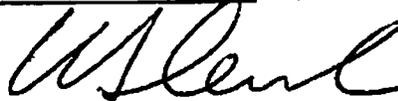
**DECLARATION OF VERNON C. BLEICH
BLYTHE SOLAR POWER PROJECT
09-AFC-6**

I, Vernon C. Bleich, declare as follows:

1. I recently retired from the California Department of Fish and Game, where I worked extensively and primarily with large mammals in the arid ecosystems that characterize eastern and southeastern California. As a private citizen, I currently offer expertise with respect to natural resource conservation issues.
2. I hold an M.A. degree in biology and a Ph.D. in wildlife biology. My relevant professional qualifications and experience are set forth in the attached curriculum vitae and the attached testimony, and are incorporated herein by reference.
3. I prepared the testimony attached hereto and incorporated herein by reference as it relates to the Staff Assessment/Draft Environmental Impact Statement and Revised Staff Assessment prepared for the project known as the Blythe Solar Power Project in Riverside County.
4. The attached testimony is true and accurate.
5. I am personally familiar with the facts and conclusions described within the attached testimony and if called as a witness, I could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed on June 8, 2010, at Hood River, OR



Vernon C. Bleich

ATTACHMENT 1

Curriculum Vitae

VERNON C. BLEICH

Eastern Sierra Center for Applied
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Personal Interests:

Hockey (I am a former goaltender), family life, banjo, gardening, hunting, and fishing.

Professional Goals:

To help ensure the persistence of populations of large mammals and their habitats through the study of their ecology and behavior, to apply that knowledge in meaningful conservation efforts, and to impart that knowledge through professional activities including publications, teaching, and other public contacts.

Education:

Ph.D. University of Alaska Fairbanks (Wildlife Biology, 1993). Thesis: "Sexual Segregation in Desert-Dwelling Mountain Sheep."

M.A. California State University, Long Beach (Biology, 1973). Thesis: "Ecology of Rodents at the Seal Beach Naval Weapons Station, Fallbrook Annex, San Diego County, California."

B.S. California State University, Long Beach (Zoology, 1970).

Professional Background:

Senior Conservation Scientist, Eastern Sierra Center for Applied Population Ecology (2007 - present). I provide expertise on natural resource conservation issues, particularly as they relate to large mammals in desert, mountain, and plains environments.

Senior Environmental Scientist, California Department of Fish and Game (2001 – 2008; now retired). I served as the project leader for the Sierra Nevada Bighorn Sheep Recovery Program, a project to conserve mountain sheep in that range and restore them to formerly occupied habitats; I continued to function as the Regional Large Mammal and Desert specialist, with an emphasis on mountain sheep and mule deer in southeastern California.

I served as chair of the Sierra Nevada Bighorn Sheep Recovery Team (also referred to as the Sierra Nevada Bighorn Sheep Science Advisory Group), and continued to serve as a member of the Peninsular Bighorn Sheep Recovery Team.

Senior Wildlife Biologist, California Department of Fish and Game (1999 - 2001). I served as the Regional Large Mammal and Desert Specialist, with an emphasis on mountain sheep and mule deer in southeastern California. At the request of the US Fish and wildlife Service I was appointed by the Department of Fish and Game to serve on the Peninsular Bighorn Sheep Recovery Team.

Senior Wildlife Biologist, California Department of Fish and Game (1993 - 1999). I served as the Regional Large Mammal Specialist and supervised the activities of 5 journeyman wildlife biologists in eastern California. Emphasis species included mountain sheep, mule deer, pronghorn, tule elk, and sage grouse in eastern California.

Associate Wildlife Biologist, California Department of Fish and Game (1986 - 1993). I served as the Regional mountain sheep specialist, and supervised the activities of 5 journeyman wildlife biologists in eastern California. Emphasis species included mountain sheep, mule deer, pronghorn, tule elk, and sage grouse in eastern California.

Project Leader, California Department of Fish and Game, Federal Aid in Wildlife Restoration Project W-26-D (1978 - 1986). I supervised 2 technicians, and planned and implemented habitat management projects designed to benefit waterfowl, sage grouse, mule deer, and mountain sheep in eastern California.

Assistant Wildlife Biologist, California Department of Fish and Game (1975 - 1978). I was an Area Biologist responsible for management of mule deer, mountain sheep, and the Endangered Stephens' kangaroo rat, as well as for environmental review activities in Riverside and San Bernardino counties, California.

Junior Aquatic Biologist, California Department of Fish and Game (1974 - 1975). I was responsible for fisheries management activities, with an emphasis on wild trout and the Endangered unarmored three-spined stickleback in Los Angeles and San Bernardino counties, California.

Park Ranger, Department of Recreation, City of Long Beach, California (1970 - 1973). I was responsible for public education activities, routine patrol, and coordination with other law enforcement agencies in El Dorado Regional Park, Long Beach, California.

Academic Appointments:

Research Professor, Department of Natural Resources and Environmental Science, University of Nevada, Reno (2007 - Present).

Affiliate Faculty, Department of Biological Sciences, Idaho State University, Pocatello, Idaho (2005 - Present).

Senior Research Associate, Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, Alaska (1998 - Present).

Affiliate Assistant Professor of Wildlife Ecology, Department of Biology and Wildlife, University of Alaska Fairbanks, Fairbanks, Alaska (1993 - 1998).

Research Associate, Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, Alaska (1993 - present).

Adjunct Assistant Professor of Natural Resource Science, Department of Natural Resource Science, University of Rhode Island, Kingston (1992 - 1994).

Instructor, Mt. San Jacinto College, San Jacinto, California. I instructed an introductory course entitled, "Wildlife Management" (1976 - 1986).

Assistant Professor, Department of Biology, Rio Hondo College, Whittier, California. I instructed lecture and laboratory sections of General Zoology (biology major emphasis), General Biology (general education emphasis), and Marine Biology (1973 - 1974).

Teaching Assistant, California State University, Long Beach. I instructed laboratory sections of General Biology (for non-majors) and General Zoology (for majors) (1972 - 1973).

Graduate Research Assistant, California State University, Long Beach. I prepared specimens and curated the collection of mammals (> 10,000 specimens) in the Bird and Mammal Museum, and instructed laboratory sections of General Ecology (for majors), General Mammalogy (for majors), and Advanced Mammalogy (1970-1972).

Graduate Student Supervision:

Chair of Graduate Committee:

Kevin L. Monteith (Ph.D.), Reproductive ecology of migratory and resident mule deer in the eastern Sierra Nevada, California. Idaho State University, Pocatello. Graduation expected December, 2010. Co-chair with Dr. R. T. Bowyer.

Michael W. Oehler (M.S.), Ecology of mountain sheep: effects of mining and precipitation. University of Alaska Fairbanks. *Graduated December 1999*. Current position: Wildlife Biologist, National Park Service, Theodore Roosevelt National Park, Medora, North Dakota. Co-chair with Dr. R. T. Bowyer.

Becky M. Pierce (Ph.D.), Predator-prey dynamics between mountain lions and mule deer: effects on distribution, population regulation, habitat selection and prey selection. University of Alaska Fairbanks. *Graduated May 1999*. Current position: Associate Wildlife Biologist, California Department of Fish and Game. Co-chair with Dr. R. T. Bowyer.

Graduate Committee Membership:

Cody J. McKee (M.S.), Ecology of mule deer in the eastern Mojave Desert, California. University of Nevada, Reno (Graduation expected June 2011).

Jeffrey T. Villepique (Ph.D.), Interactions between mountain lions and mountain sheep: an assessment of forage benefits and predation risk. Idaho State University, Pocatello (Graduation expected December 2010).

Sabrina Morano (Ph.D.), Reproductive biology of mule deer in the White Mountains, Inyo and Mono counties, California. University of Nevada, Reno (Graduation expected June 2011).

Jericho C. Whiting (Ph.D.), Behavior and ecology of reintroduced Rocky Mountain bighorn sheep. Idaho State University, Pocatello. *Graduated December 2008*. Current position: Wildlife Biologist, Idaho National Laboratory, Twin Falls.

Cody A. Schroeder (M.S.), Habitat selection by mountain sheep: forage benefits or risk of predation? Idaho State University, Pocatello. *Graduated September 2007*. Current position: Doctoral Student, University of Nevada, Reno.

Jason P. Marshal (Ph.D.), Foraging ecology and water relationships of mule deer in a Sonoran Desert environment. University of Arizona, Tucson. *Graduated May 2005*. Current position: Lecturer, University of the Witwatersrand, South Africa.

Heather E. Johnson (M.S.), Antler breakage in tule elk in Owens Valley, California: nutritional causes and behavioral consequences. University of Arizona, Tucson. *Graduated January 2004*. Current position: Doctoral Student and Research Associate, University of Montana, Missoula.

Jennifer L. Rechel (Ph.D. [Geography]), Influence of neighborhood effects and friction surfaces on the spatial distribution and movement strategies of desert-dwelling mountain sheep (*Ovis canadensis*). University of California, Riverside. *Graduated August 2003*. Current position: Wildlife Biologist, U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station, Riverside, California.

Holly B. Ernest (Ph.D.), Ecological genetics of mountain lions (*Puma concolor*) in California. University of California, Davis. *Graduated December 2001*. Current position: Research Geneticist, School of Veterinary Medicine, University of California, Davis.

Esther S. Rubin (Ph.D.), The ecology of bighorn sheep (*Ovis canadensis*) in the peninsular ranges of California. University of California, Davis. *Graduated December 2000*. Current position: Conservation Biologist, The Conservation Biology Institute, Borrego Springs, California.

Nancy G. Andrew (M.S.), Demography and habitat use of desert-dwelling mountain sheep in the East Chocolate Mountains, Imperial County, California. University of Rhode Island, Kingston. *Graduated May 1994*. Current position: Staff Environmental Scientist, California Department of Fish and Game.

Awards and Honors:

Honorary Lifetime Membership, 2010 (in recognition to long and continuing service to the Society for the Conservation of Bighorn Sheep)

Wild Sheep Biologist Wall of Fame Award, 2009 (in recognition of significant contributions to the conservation of wild sheep in North America) (Wild Sheep Foundation)

Lifetime Achievement Award, 2008 (In recognition of contributions toward the conservation of mountain sheep in California) (California Chapter of the Foundation for North American Wild Sheep)

Honor Plaque 2007 (Group Award, in recognition of outstanding contributions toward the recovery of mountain sheep in the Sierra Nevada) (Desert Bighorn Council)

State Statesman Award, 2006 (In recognition of outstanding contributions to the wild sheep of California) (Foundation for North American Wild Sheep)

Trail Blazer Award, 2004 (In recognition of efforts on behalf of mountain sheep conservation in California) (California Chapter of the Foundation for North American Wild Sheep)

Director's Achievement Award, 2004 (In recognition of editorial services for California Fish and Game (California Department of Fish and Game)

Annual Achievement Award, 2004 (In recognition of conservation of mule deer and their habitats) (Southern California Chapter, California Deer Association)

Alumni Achievement Award for Professional Excellence, 2002 (University of Alaska Alumni Association)

Outstanding Alumnus Award, 2002 (College of Science, Engineering, and Mathematics, University of Alaska Fairbanks)

Sustained Superior Accomplishment Award, 2002 (California Department of Fish and Game)

The Desert Ram Award, 2001 (Desert Bighorn Council)

Outstanding Publication Award for a Monograph, 1998 (The Wildlife Society)

Award of Appreciation, 1998 (San Fernando Valley Chapter of Safari Club International, CA)

Professional Membership, Boone and Crockett Club, 1998 (Boone and Crockett Club)
Certificate of Appreciation, 1997 (Society for the Conservation of Bighorn Sheep)
"Ol' Irongut" Award, 1996 (California Department of Fish and Game, Division of Air Services)
Resources Agency/University of California Fellowship, 1996 (Sponsored jointly by the
California Resources Agency and the University of California, Davis)
Director's Achievement Award, 1992 (California Department of Fish and Game)
Outstanding Biology Department Alumnus, 1988 (California State University, Long Beach)
Professional of the Year, 1985 (Western Section of The Wildlife Society)
California Wildlife Officer of the Year, 1984 (Shikar-Safari Foundation)
Award of Honor, 1984 (Society for the Conservation of Bighorn Sheep)
Honorary Lifetime Member, 1984 (Banning [California] Sportsman's Club)

Professional and Fraternal Memberships:

American Society of Mammalogists (Life Member)
The Boone and Crockett Club (Professional Member)
The Wildlife Society
Society for Conservation Biology
Southwestern Association of Naturalists
Wild Sheep Foundation
National Rifle Association
California Chapter, Foundation for North American Wild Sheep
Society for the Conservation of Bighorn Sheep
Minnesota-Wisconsin Chapter, Foundation for North American
Wild Sheep

Licenses and Certifications:

California Community College Credential (#45476, Lifetime)
State of California Certified Blaster's License (#2087)
Certified Wildlife Biologist (1981 - The Wildlife Society)
California Hunter Safety Instructor (#1984)

Other Professional Activities:

Editorial Activities:

Editor-in-Chief, *California Fish and Game* (2009 - present)

Associate Editor, *California Fish and Game* (1995 - 2009).

Editor, *Transactions of the Western Section of The Wildlife Society* (1988).

Associate Editor, *Transactions of the Western Section of The Wildlife Society* (1986-87).

Reviewer for Journals:

Conservation Biology, Journal of Wildlife Management, Wildlife Society Bulletin, Journal of Mammalogy, The Condor, California Fish and Game, Transactions of the Western Section of the Wildlife Society, Western North American Naturalist, Desert Bighorn Council Transactions, Southwestern Naturalist, Proceedings of the Northern Wild Sheep and Goat Council, Journal of Wildlife Diseases, Great Basin Naturalist, Bulletin of the Southern California Academy of Sciences, Journal of Zoology (London), Vida Silvestre Neotropical, Wildlife Biology, Wildlife Monographs, European Journal of Wildlife Research, Biological Conservation, Journal of Arid Environments (An average of about 12 reviews per year).

Other Activities:

2008 – Present: Member, Big Game Records Committee, Boone and Crockett Club

2007 – Present: Advisory Board Member, Texas Bighorn Society

2007 – Present: Science Advisor, Society for the Conservation of Bighorn Sheep

2006 - Present: Member, Ad Hoc Committee on Professional Membership, Boone and Crockett Club.

1998 - 2002: Coach and member of Board of Trustees, Sierra Roller Hockey League.

1995-96: Vice Chairman, The Desert Bighorn Council.

1994-98: Member, Board of Directors, The Wildlife Forensic DNA Foundation.

1993 - Present: Member, Wildlife Management Professional Advisory Committee, Foundation for North American Wild Sheep.

1991: Member, Committee on Support of Symposia and Conferences, The Wildlife Society.

1989-1993: Member, Board of Trustees, Friends of the Eastern California Museum; Vice-chairman, 1991-1992; Chairman, 1993.

1987-1988: Chairman, The Desert Bighorn Council.

1988: Co-chairman, Wildlife Water Development Symposium, Western Section of The Wildlife Society.

Refereed Publications:

Bleich, V. C. *In review.* Perceived threats to mountain sheep: levels of concordance among western states, provinces, and territories. Desert Bighorn Council Transactions.

Marshal, J. P., and **V. C. Bleich.** *In review.* Geographic variation in relationships between El Niño Southern Oscillation and mule deer harvest in California, USA. Southwestern Naturalist.

Jaeger, J. R., J. D. Wehausen, and **V. C. Bleich.** *In review.* Incentives for migration by female mountain sheep: water requirements, nutritional gains, or decreased predation risk? Journal of Mammalogy.

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Presentations at Professional Meetings

From 1972 to the present, I have been an author or coauthor of more than 100 presentations at professional meetings. I was selected to present the keynote address, "Ecology of mountain sheep: Ramifications for disease transmission and population persistence" at the April 2007 Workshop on Respiratory Disease in Mountain Sheep: Knowledge Gaps and Future Research held at the University of California, Davis. Details pertaining to these presentations are available upon request.

Grants and Fellowships

During 1973 - 2007, I competed successfully for and received project-specific funding in the amount of \$1,636,247 from internal and external sources. Details of grants and other funding received are available upon request.

DECLARATION OF SERVICE
Blythe Solar Power Plant Project

Docket No. 09-AFC-6

I, David Weber, declare that on June 11, 2010, I served and filed copies of the attached **TESTIMONY OF VERNON C. BLEICH ON BEHALF OF CALIFORNIA UNIONS FOR RELIABLE ENERGY FOR THE BLYTHE SOLAR POWER PROJECT** dated June 11, 2010. The original document, filed with the Docket Office, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:
http://www.energy.ca.gov/sitingcases/solar_millennium_blythe/index.html.

The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Office via email and U.S. mail as addressed below:

CALIFORNIA ENERGY COMMISSION

Attn: Docket No. 09-AFC-6
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.
Executed at South San Francisco, California on June 11, 2010.

/s/

David Weber

CALIFORNIA ENERGY COMMISSION Attn: Docket No. 09AFC6 1516 Ninth Street, MS4 Sacramento, CA 95814-5512 docket@energy.state.ca.us	Alice Harron Senior Director-Project Dvlpmnt 1625 Shattuck Ave., #270 Berkeley, CA 94709-1161 harron@solarmillennium.com	Elizabeth Ingram, Associate Dvlpr Solar Millennium, LLC 1625 Shattuck Avenue Berkeley, CA 94709 ingram@solarmillennium.com
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