EG1-EXHIBIT 2

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Mr. Caleb Hiner, Project Lead
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Dear Mr. Hiner:

My name is Bill Alldredge. I am a resident of Wyoming concerned about management of our natural resources. I have been a professional wildlife biologist all my adult life, spent much of my career conducting research on large wild mammals and their habitats, and taught university level courses in ecology, big game management and integrated ecosystems management. I am familiar with the Pinedale area having conducted studies there during the 1970s. My resume' is provided with this letter.

At the request of The Wyoming Outdoor Council and The Wilderness Society, I offer comments on the Revised Draft Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project (RDPASEIS) with hope that they will be interpreted constructively and useful in drafting the final management plan. My comments consider mule deer and pronghorn antelope populations and their habitats. I provided comments (March 2007) on the initial Draft Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project (PASEIS). Because it appears that the BLM has not yet evaluated those comments, I appended them to this correspondence. Please evaluate those comments, too, they are mostly applicable to the revised draft. Alternatives D and E are the main focus of my current comments, but some redundancy of my earlier comments seems warranted.

W-1 EG-1-EX2-1

Alternatives D and E contain some features that may help reduce impacts to mule deer and pronghorn antelope. Reducing the amount of surface area disturbance and vehicle traffic via concentrated development, directional drilling, liquids gathering systems, bussing personnel, computer-assisted operations, establishment of a monitoring and mitigation fund and Federal suspended and term NSO leases in Alternative D may all help reduce impacts for big game animals. The slower development pace and maintaining seasonal timing limitations are beneficial facets of Alternative E. Although Alternative E does limit well pad density in the core area and in the "Buffer" and "Flanks," these densities allow for surface disturbance at least equal to, or in excess of, those already existing in the core area that have led to impacts discussed herein. **It is my professional opinion that, as presented, neither Alternative D or E will reduce impacts to mule deer and pronghorn antelope populations to the extent that could be achieved with a combination of these alternatives. Furthermore, because of the uniqueness of both mule deer and pronghorn herds that winter on the Mesa (Sawyer et al. 2005b), these big game mammals warrant our concern.** In the following paragraphs I

discuss Alternatives D and E and suggest ways in which they might be improved to reduce impacts to wildlife while allowing for energy extraction.

Alternative D benefits the Proponents by expanding core areas and permitting year-round development as well as a de-facto expansion of these areas by bordering their periphery with a potential development area (PDA) that appears to be available for development if proponents deem it necessary (2-45). I note that, albeit Anschutz, BP and Yates stand to benefit from implementation of Alternative D, they partner in almost none of the mitigation measures (2-43).

W-2 EG-1-EX2-2

Though not specifically stated, the underlying theme of Alternative D appears to be: *Give industry the freedom to extract as much natural gas as they can as fast as they can, maximizing disturbance at any one point it time, but reducing total time of construction and development.* Certainly Alternative D appeals to the Proponents and on page 9C-4 they pledge to make "efforts to reduce the total duration of project activities in the PAPA," and go on to state that if development follows specifications in Chapter 2, the result will be the greatest amount of habitat left undisturbed at any point in time. Additionally this undisturbed habitat will be "in the best combination of: largest area, largest contiguous blocks, best functional connectivity and highest quality." There is no mention of how the best functional connectivity and highest quality will be determined and for what wildlife species these determinations will be made, nor is it clear the location and size of these habitat "blocks." If I am interpreting development scenarios correctly and when I consider them in light of impacts that have already occurred on the Mesa and reclamation potential, I do not agree that this is the best approach for "minimizing impacts." Accelerated development pace will lead to more rigs and associated personnel operating at any one time, especially during the critical winter season. As Appendix 3 (pages 3-3 to 3-4) makes clear, the more drill rigs operating, the greater the impacts to wildlife, an assessment with which I agree. This approach will create more direct and indirect disturbance and thus continue to displace and impact mule deer and pronghorn antelope. Furthermore, because of the time required to return disturbed areas to a functional sagebrush community (Baker 2006), the actual amount of disturbed habitat over the LOP will be no different than with Alternatives A, B, and C.

W-3 EG-1-EX2-3

In my professional opinion the rapid pace of development proposed in Alternative D will not reduce impacts to wildlife populations but will, instead, result in more disturbance and habitat loss at critical times of the year and in crucial habitats. Although slower paced development would result in activity on the PAPA for longer period of time, I believe that this approach coupled with enforced winter timing limitations would reduce impacts to mule deer and pronghorn populations because it would:

- Potentially result in less disturbed habitat at any one time, especially during winter, thus providing more large undisturbed tracts for wildlife as well as movement corridors across the Mesa.
- Reduce impacts from human disturbance during the critical winter period.
- Allow time for the Proponents to actually prove they can successfully reclaim disturbed areas to a functioning sagebrush community.
- Assuming successful reclamation, provide at least some reclaimed habitats for wildlife.
- Allow time for habitat improvements in "Flank" areas.
- Allow time to for recognition of lags in population responses to habitat disturbances and thus time to attempt to mitigate impacts.

EG-1-EX2-4

The site-specific, scientifically credible studies of Sawyer et al. (2006a, 2006b) reported

W-4 EG-1-EX2-4

a 46% reduction in wintering deer populations during the first 5 years of development on the Mesa with less than 2% direct disturbance of habitat and deer shifting habitat use from presumed higher quality habitats to lower quality habitats. In the scientific opinion of those authors, the only way to reduce significant impacts to mule deer is by limiting the number of roads, well pads, pipelines and human activity. I agree with that assessment and, based on my considerable experience with pronghorn antelope, I believe those conclusions are applicable to that species as well. **The approach suggested in Alternative D is contrary to this best available scientific evidence and in my opinion would only exacerbate an already serious situation for mule deer and pronghorn antelope that depend on the Mesa for crucial winter habitat.** I know of no valid scientific studies that would endorse the approach in Alternative D for an area as large as the PAPA and one that provides such crucial wintering habitats for big game animals. Quite simply, having activity scattered across the Mesa Crest throughout the year, especially during the critical winter season, will have far greater impacts on mule deer and pronghorn antelope than an alternative that restricted winter activity and had less disturbance at any one time.

W-5 EG-1-EX2-5

Part of the preferred mitigation action (Appendix 10-6) is habitat improvement on the "core/crest and Flanks." Realistically, fast paced development precludes this mitigation action because there would simply not be enough time for habitats to be improved. Furthermore, if wholesale development were allowed as suggested in Alternative D with no winter timing limitations, resource managers would be severely limited in regard to habitat improvement treatments they might apply. If "Flank" habitats represent the majority of habitat available to displaced big game animals, taking even small portions of these habitats out of production for even a few years, as most vegetation treatments do, could be a critical impact to displaced, big game animals in winter. The presence of large concentrations of displaced animals might also impact vegetation treatments to the extent that they would ultimately provide little benefit. **In short, there is little logic, and no scientific credibility in suggesting that with rapid development on the Mesa, "core/crest and Flank" habitats could be improved to accommodate displaced big game.** To my knowledge, there are no studies that provide empirical evidence of mule deer or pronghorn population response to habitat manipulations (Anderson and Freddy 2007, Bergman et al. 2006).

W-6 EG-1-EX2-6

On page 4-149 and 4-151, the BLM acknowledges that they expect lags in wildlife population responses to impacts resulting from energy extraction on the PAPA and cites scientific literature to support this fact (Nagelkerke et al. 2002). Given that lags in population responses are expected and that we currently do not know how long after a disturbance a population response will be manifest, it hardly seems prudent to allow rapid development. **Fast-paced development as suggested in Alternative D could hinder identification of population responses to disturbance and preclude response capability via any sort of theorized mitigation.**

W-7 EG-1-EX2-7

Appendix 10, Wildlife Monitoring and Mitigation Matrix represents an attempt to establish criteria for monitoring which would trigger mitigation for wildlife and big game animals. For mule deer the criteria are change in deer numbers and avoidance distances and for pronghorn, changes in numbers and size of habitat fragments are used. In both cases, however, for any mitigation to be triggered a 15% change in numbers "compared to a reference area" must also occur. Thus the only true trigger is change in numbers, which I am assuming implies a downward change, although this is not specified in the matrix. There is no indication how 15% change was determined to be the appropriate trigger nor are methods for ascertaining this change elucidated. One must also keep in mind that this 15% change would be on top of a reduction in excess of 46% in mule deer (Sawyer et al. 2006a) and an unknown reduction in

EG-1-EX2-7

pronghorn numbers that has already been imposed on Mesa populations. Thus, for mule deer there would be a cumulative population reduction in excess of 60% before mitigation would be considered. Furthermore, as of 2006, a 46% change in deer numbers had been measured on the Mesa (Sawyer et al. 2006a) and, to my knowledge, the BLM, WGFD and Proponents have not initiated any mitigation actions for those impacts.

W-8

EG-1-EX2-8

Because estimates for the Mesa and Anticline (treatment areas) would be compared to reference areas I am assuming that a 15% change in deer numbers there would actually be interpreted as 15% more change than reflected in the reference area, otherwise there is little logic in sampling a reference area. Based on impacts to mule deer and pronghorn that have already occurred from energy development in the PAPA, a 15% change in numbers should trigger a mitigation response regardless of what is happening in a reference area.

Problems with estimating animal numbers on the Mesa or Anticline and comparing them to a "reference area" are:

- Natural variability will likely swamp the estimate resulting in a large error term and contention as to whether a change has really occurred.
- Current research suggests there will be difficulty in obtaining a population estimate for a reference area that could be used for comparison.
- The suggested reference area, Sublette Deer Herd Unit, spans far too diverse an area with too large population to allow precise population estimates or a valid comparison.
- The population can actually be trending toward a decrease when yearly estimates of population size fail to be indicative of this change.
- The lag in population response to habitat impacts could be such that by the time a change is measured, it is too late to remedy the problem (assuming we knew how to remedy the problem)
- Population size is not the best parameter to measure.

Certainly wildlife biologists who have worked with big game population estimation appreciate the natural variation and error involved in these estimates and the level of sampling effort that would be required to obtain a precise estimate. The SEIS supports this point on page 3-121 where survival rates for pronghorn are presented. The difference in treatment and control survival rates between the two areas is 26% but they are reported as being non-significant. In order to conclude, with statistical confidence, that a 15% change in population size had occurred confidence intervals on this estimate would need to be less than 7.5% which will be very difficult to obtain considering natural variability and sampling errors likely to be encountered.

EG1-EX2-9

The fourth bulleted item above needs additional explanation. Past research on mule deer indicates that mortality strikes the sub-adult age classes most heavily and that adults generally persist into old age or until the occurrence of an exceptionally bad winter (White et al. 1987, Bartmann et al.1992). In other words, adult mortality is often more year specific than age specific. In a situation like the Mesa, where deer are displaced by energy development into more marginal winter habitats (Sawyer et al. 2006b) competition increases and sub-adult survival may decrease. With decreased sub-adult survival, there are less individuals remaining to be recruited into the population. Thus, we could conceivably be counting almost the same number of deer every year, at least for a time, but the population is ageing. With increasing age, production declines further reducing recruitment potential. When old animals in this population die as a result of old age, or a severe winter, the population suddenly crashes. Had

W-9 EG-1-EX2-9

we measured population size only, this crash might be a surprise but a measure of sub-adult survival would have suggested an ageing population with potential for a crash long before the crash ever occurred. Thus measuring sub-adult (over-winter fawn) survival would be more indicative of what is actually happening to the population and this parameter can be measured fairly precisely via radio-telemetry (Garrott and White 1984, White et al. 1987). I discussed this issue with 5 of my professional colleagues who are all familiar with sampling wildlife populatons, and all agreed that measuring a 15% change in the population with any degree of precision would be extremely difficult. They also concurred that over-winter fawn survival was a better measure to use as a trigger for mitigation actions. **In my professional opinion over-winter fawn survival is the appropriate parameter to measure for a mitigation response trigger.** The mitigation process, touted in paragraph 2 page 10-5, will likely fail to meet its laudable goals because the "performance-based measure" suggested is inappropriate and cannot be measured with much precision.

W-10 EG-1-EX2-10

Mitigation responses (10-6) are also problematic. In the first place, it seems that initiation of a mitigation response would be promulgated by a population response to impacts on the Mesa or Anticline resulting from energy development impacts (at least this is what the matrix indicates). Why is it then that the causative factor, actions by the Proponents on the Mesa or Anticline, is the very last mitigation response considered? **The BLM must justify why adjustments in the Proponents actions are not a higher priority mitigation response and if they cannot do so, response number 4 should become response number 1.** The causative factor responsible for any triggering of a threshold must be addressed first to have the best assurance of correcting the problem.

LS-1/W-11 EG-1-EX2-11

I endorse assuring that flank and other adjacent habitats are protected from development impacts and that they are available to wildlife populations. We are assured, however, of only 5 years of protection for these habitats that are leased by the proponents and that hardly buys us much habitat security for mule deer and pronghorn when the LOP is projected to exceed 60 years. Secondly, the SEIS provides no assurances that the BLM will not lease adjacent areas or that there are areas available for conservation easements that have not been leased for minerals. If undisturbed areas that could provide alternative habitats for displaced wildlife exist, they should be clearly identified in the SEIS and assurances provided that they will be protected and available for wildlife use for the LOP.

W-12 EG-1-EX2-12

In the remainder of mitigation responses and elsewhere in the SEIS there is heavy reliance on habitat enhancement to mitigate impacts to deer and pronghorn populations. Nowhere do I find reference to what these enhancements might be and as I earlier stated, scientific studies documenting the efficacy of habitat treatments for winter big game are lacking. Critical winter ranges for big game animals are a unique combination of topography, location and vegetation communities and these unique combinations are not abundant across our western landscape. Not only does the SEIS fail to specify what sorts of enhancements might be employed, it also fails to indicate where these habitats are that might be enhanced, and provides no indication that animals displaced from the Pinedale Anticline would find these enhanced areas. Additionally, there are no assurances that enhanced habitats would be spared from development impacts. In my professional opinion the feasibility for enhancement of crucial winter habitats in the vicinity of the PAPA to meet the needs of animals displaced from energy development activities has not been demonstrated. **The BLM must assure that there are accessible habitats that can be enhanced and provide details for the sorts of enhancements that are envisioned to improve these habitats such that they meet over-winter needs of displaced mule deer and pronghorn antelope. Protection of these habitats needs to be assured for the LOP.**

W-13 EG-1-EX2-13

Because habitat enhancements can be habitat disturbance, at least initially, consideration must be made as to whether these "enhancements" are in fact removing habitat at least initially, and some consideration of how long that will occur should be made. This is especially important when the likely lag in population responses to disturbance is factored in.

W-14 EG-1-EX2-14

The Proponents commit (9C-6) "to developing a comprehensive off-site mitigation plan within one year of SEIS ROD release." Although some "options" that may be included in the plan are suggested, there no are details presented. The BLM should require the Proponents to prepare an off-site mitigation plan with specificity and this should be done prior to the SEIS ROD to allow for public review and so that the efficacy of the plan can be assessed. The need for development of this plan is further emphasized by the Proponents on page 9C-7 when they discuss off-site mitigation in relation to adequacy of on-site mitigation and value of the offsite measures. **The BLM and the public need assurances that mitigation will occur, what it will entail, how "values" and habitat needs will be assessed and how habitats will be improved.** This is especially critical considering impacts that have already been imposed on PAPA wildlife populations. I am unable to make much sense out of the last sentence in the second bulleted paragraph on page 9C-7 and this needs clarification. For the reasons I state above, I remain skeptical of the philosophy, "fix it and they will come." What we are going to fix and how it is going to be fixed needs to be clarified early in the process.

MF-1 EG-1-EX2-15

To pay for mitigation and monitoring activities, the Proponents commit to development of the "Pinedale Anticline Operator's Mitigation and Monitoring Fund (Fund)." There is no indication as to how the dollar amount for this fund was determined, which further emphasizes the need to have mitigation and monitoring plans developed early so that actual costs can be assessed with assurance that adequate funding will be available to cover costs. The Fund is to pay for monitoring and mitigation for the life of the project. For a project of the magnitude of the Pinedale Anticline development and with the associated disturbance and duration of this disturbance, funds should be made available beyond the life of the project. This is especially critical when we consider potential lags in wildlife population responses to both disturbance and mitigation activities. A more appropriate timeline would be to continue the "Fund" until measurements from scientifically credible monitoring indicate that impacts have actually been mitigated. **The BLM should require the Proponents to justify the dollar amounts associated with the "Fund" and assure that funds will be available for mitigation and monitoring beyond the LOP.**

EG-1-EX2-16

Alternative D includes a Potential Development Area (PDA) that essentially surrounds the Core Development Area (CDA). Page 2-45 indicates that the PDA could be developed depending on results of delineation drilling and approval from the BLM AO. Additionally, if development proceeded in the area it would be year-round. Based on my understanding of directional drilling capabilities, it seems feasible to me that the majority of the PDA could be accessed from drill pads strategically located on the CDA precluding any surface disturbance of the PDA. Protection of habitats in the "Flanks" with Federal Suspended and/or NSO Leases is a good approach that may help mitigate some habitat loss in the "core/crest" area. We are assured that the Proponents "offer," to honor such a suspension "for at least 5 years" (2-50) but there are no guarantees beyond that. This hardly seems like much of a concession given that for the next 5 years almost all available drilling rigs will be fully occupied in the CDA if Alternative D is approved. Furthermore, 5 years would not allow time for successful reclamation of disturbed habitats in the CDA to support big game animals. Drawing conclusions from my past experience in the area and reports of Sawyer et al (2006a and 2006b) crucial winter range available in the areas classified as either PDA, Buffer and/or Flanks represent some of the last somewhat undisturbed areas where mule deer and pronghorn antelope that had depended on

W-15 EG-1-EX2-16 the Mesa can spend winter. Thus, assuring that these areas will not be developed would mitigate, to some extent, impacts to these animals from development in the CDA. **The PDA should be incorporated into the "Buffer Area" and "Flanks" found in Alternative E and protected from disturbance for at least the life of the project.**

RC-1 EG-1-EX2-17 I am not a reclamation specialist, but because reclamation is such an essential part of development and mitigation, I evaluated the Alternative D and E reclamation plan. **This reclamation plan is well done, addressed concerns expressed in my earlier comments and provides measurable objectives with temporal constraints for monitoring success. The BLM should ensure these plans are fully implemented so as to ensure impacts to big game are reduced.**

W-16 EG-1-EX2-18 Alternative E purportedly slows the pace of development to accommodate public concerns (2-52) and increases the total number of potential well pads with a slight decrease in the number of acres disturbed. Additionally this alternative limits year-round drilling on crucial big game winter ranges and sage-grouse habitat. This alternative contains no discussion of monitoring or mitigation for big game animals and does not include any of the Proponent proposed, beneficial actions of Alternative D. Although acreages of some MAs have been reduced (2-53) the extent of this reduction is not quantified. Furthermore, Alternative E does not place habitats in the "Buffer" or "Flanks" off limits to development. Although well densities are limited in Alternative E for the core, "buffer" and "flanks" (Table 2.4-13 page 2-55) the direct habitat disturbance associated with this development disturbs as much as 8% of the surface area on a per section basis (40 to 60 acres per 640 acres). Sawyer et al (2006a) measured a 46% reduction in wintering mule populations on the Mesa with less than 2% surface disturbance from mineral resource development. It is reasonable to suspect that impacts to deer wintering in the "Buffer" and "Flanks" areas could be of this magnitude or possibly even larger if development at the approved level occurs there. Mule deer and pronghorn displaced from the CDA may move into the "Buffer" and "Flank" areas increasing population density there. Bartmann et al. (1992) demonstrated density dependent responses in mule deer populations resulting in increased competition and over-winter mortality and decreased recruitment and population size. Habitat quality appears to be the driving force in this response (Bartmann et al. 1992, Hurley and Zager 2004 and Bishop et al. 2005). **Given these factors, the BLM should ensure that there is no disturbance in either the flanks or the buffer area under Alternative E for the LOP.**

RC-2 EG-1-EX2-19 Slowing the pace of development by 10 years under Alternative E is preferable to that allowed in the other alternatives, but it may not be sufficient to mitigate impacts to big game animals. Ten years is insignificant within the timeframe of ecological succession and thus, probably not enough time to facilitate much reclamation following disturbance (see Baker 2006) but it could help. Understandably interim reclamation of some well pads would be limited under Alternative E (2-258) but this could be regulated if the BLM would require interim reclamation prior to allowing construction of another well pad.

EG-1-EX2-20 The significant advantage to this alternative for big game animals will be limitations on winter development activities. The question that begs answer, however, is: Will the BLM actually require timing limitations? The original ROD included timing limitations yet the BLM approved all or parts of 267 requests for exceptions from these stipulations in the first 5 years of development on the MESA (see original PASEIS Appendix K, p. 2). My past experience with big game animals suggests that it is largely human disturbance that causes habitat avoidance (Alldredge and Deblinger 1988, Morrison et al. 1995, Phillips and Alldredge 2000, Shively et al. 2005). Restricting human disturbance during winter will benefit mule deer and pronghorn

W-17 EG-1-EX2-20

antelope on the Mesa. **In my professional opinion, slowing the pace of development and reducing human disturbance by enforcing winter timing limitations will help reduce impacts to wintering big game animals on the Mesa far more than concentrated development occurring on a year-round basis.**

W-18/AL-2 EG-1-EX2-21

A "preferred alternative" that would be more salubrious for big game animals and likely many other species of wildlife would be a combination of Alternative D and E with improvements in mitigation and monitoring. From Alternative D the BLM should select:

- All activities that reduce surface disturbance.
- Computer monitoring and personnel bussing to reduce human impacts.
- Mitigation and Monitoring Fund
- Financial support for research and habitat studies.
- Protection of "Buffer" and "Flank" habitats for the LOP
- Planning and coordination meetings
- Reclamation Plan for Alternatives D and E

G-1 EG-1-EX2-22

The BLM should slow the pace of development by at least 10 years as suggested in Alternative E, enforce wildlife seasonal timing limitations and make every effort to reduce human activity in crucial winter habitats during winter. In addition the BLM should consult qualified wildlife and range scientists and develop a wildlife monitoring and mitigation plan that will actually work. This plan should define triggers, methods of measurement and mitigation responses. The trigger for mule deer and pronghorn antelope should be based on over-winter fawn survival and mitigation should allow for modification of oil and gas operations (the causative factor) as a primary response if a threshold is triggered. As minerals leases on surrounding areas expire, the BLM should retire these leases and pursue, as much as possible, Federal Suspended and Term NSO leases. Areas on the Pinedale Anticline that are currently un-leased (especially on the western flanks) should remain that way through affirmative decision.

Certainly, there will continue to be impacts to the area's wildlife populations from energy development and human activities. The suggestions I offer above represent the best combination of alternatives discussed in the SEIS for reducing impacts to wildlife from minerals resource development on the Pinedale Anticline, while allowing for development.

G-2 EG-1-EX2-23

Conclusions drawn from my analysis of the PASEIS remain unchanged. That document and The Revised Draft Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project (RDPASEIS) fail to meet the standards under NEPA for a scientifically credible and supportable documentation of impacts resulting from a project and presentation of means by which those impacts can be reduced. Addition of Alternatives D and E do not alter my earlier conclusion that the "single-minded focus on energy extraction appears to violate the multiple use requirements of FLPMA." The combination of Alternatives D and E that I suggest would be a positive step toward reducing some of the impacts experienced by wildlife populations in the PAPA.

I appreciate your consideration of my comments and request that if the BLM disagrees with my comments, they provide a reasoned and supported justification for their disagreement.

Respectfully,

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