This letter responds to your request to evaluate the document titled *Estimating Changes in Carbon Storage in the Cragin Watershed Protection Project*, prepared by S. Plumb and K. Woods in March of 2019 for the American Carbon Registry and Methodology Review Panel. The comments provided here apply only to this document and do not supersede my earlier and more comprehensive evaluation of the *Southwestern Forest Restoration Methodology*.

Figure 3 illustrates, much more clearly than before, the potential for the project area to lose a substantial fraction of its forest carbon stocks over the next 40 years in the event unmitigated wildfire converts existing forest into grasslands or chaparral vegetation. The author's approach to forecasting long-term effects of fire, climate, and forest management on territorial carbon storage is extremely informative. Unfortunately, due to opaque parametrization and inadequate uncertainty analysis, it falls far short of demonstrating ex-ante net carbon benefit, and due to a lack of any proposed empirical control, it cannot adequately demonstrate ex-post net carbon benefit. For these reasons, and those articulated in my earlier reviews, I am recommending the ACR not adopt the methodology.

Regarding opaque parametrization: The effects of wildfire on forest carbon stocks are highly dependent on the fraction of carbon combusted across different fire severities and the rate at which fire-killed trees subsequently decompose. My experience is that many forest carbon models grossly overestimate these factors, and without knowing what rates are being used in this methodology, I cannot be confident in the accuracy of its predictions. Moreover, it is not clear the degree to which shrub and grass regeneration is being favored over tree regeneration in these simulations. Since carbon loss is sustained only through vegetation state-change, one needs to know how it is being simulated in order to be confident in the model predictions.

Regarding inadequate uncertainty analysis: The authors state that uncertainty propagation requires additional USFS plot data. This misses the point entirely. The arithmetic propagation of biometric sampling error is not the relevant uncertainty here. The relevant uncertainty is that surrounding the timing and magnitude of simulated carbon stock oscillations. Quantifying uncertainty in the prediction of non-linear emergent properties is extremely difficult, so I tend to set the bar low. Still, this methodology makes no attempt whatsoever to propagate uncertainty in the parameters that actually drive the dramatic carbon loss suggested in Figure 3 (i.e. combustion factors, decay rates, and post-fire successional trajectories). I know from experience, even modest tweaks in these uncertain parameters would have a large effect on the baseline shown in Figure 3.

Regarding the lack of any proposed empirical control: The proponents of this project have committed to monitoring carbon stocks on their treated landscape over the duration of the carbon crediting period. However, the net carbon storage attributed to treatment comes not from what this landscape retains under treatment, but from what it will not lose to unmitigated wildfire. How do the proponents propose to quantify that counterfactual condition in 2040 or 2050? Will they forever point to the carbon collapse predicted today in Figure 3? Will the modeling behind Figure 3 be updated each year for 40 years to reflect changes in our understanding of system behavior? A big problem with this project from the get-go is that after 40 years, you will never know what did not happen to these forests and are left with nothing but virtual verification.