Dear Dr. Peterson,

I received the new version of your manuscript and I think that it was improved by following the reviewer's recommendations, but not enough to be ready for publication.

Please see below my comments (in red) regarding your answers and provide a new version of your manuscript or a rebuttal letter explaining your points of view.

With my best regards,

Graciela Piñeiro

Editorial Comments:

It could be very useful to your manuscript that you provide photographs of the quarries, showing a general view of the outcrops and also of the bone beds that you studied. Taphonomic studies require high quality and informative imaging to show what you are describing and interpreting, even more when you are suggesting a new taphonomic hypothesis. I could not see the phosphate crystallites from your figure 7. JP: Figure 7 has been revised to include better images of the thin section. Upon further analysis of the improved image with a better microscope and computer, the mineral in-filling appears to be pyrite. The manuscript has been updated to reflect this revelation. It could be also interesting that you can provide detailed images of the studied deposits and the compared bone beds. JP: Unfortunately we do not have any photographs of the JONS site that would be usable for demonstrating details of the outcrop. This site is being planned for further future study and will include more detail later.

I cannot imagine the situation here. You decided to perform a taphonomic study and you did not take any photographs of the site and the fossils? You have just seen the outcrop and from memory you are describing it? Thus, you are talking about new taphonomic models without show the evidences you have to support them? From which part of the bone bed you taken the samples? How the small, weathered fragments were distributed in the bone bed? You have to show all providing minimal a photograph that you will use to orientate the readers into your analysis and final considerations. We need a photograph of the complete bone bed here, at least just one, to show the preservation type and spatial distribution of the fossils.

Why about time averaging? Do you think that all the carcases represented in the bone beds were deposited at the same time? Include the 46 Allosaurus skeletons individuals that can be considered juveniles? JP: The variability of abrasion of bone fragments suggests that not all exposed bones were destroyed at the same time. As such, we propose that the site is time averaged; carcasses were introduced over a period of time.

How you arrive to such conclusion if you don´t provide images of the entire exposed bones? The isolated bones that you show in figure 3 are not enough proofs to make statements about the taphonomic history of more than 40 skeletons!

The majority of Allosaurus skeletons representing juveniles is not surprising; most extant archosaur populations are composed of mostly juvenile to subadult individuals. Finding a population of only old adults is quite rare.

Which extant archosaurs? You mean crocodiles?, and you had into account that reptiles grow during all their lifes? Thus, here, the interesting will be that you explain how you would know about the real ontogenetic stage of the preserved 46 individuals.

The small fragments that you analyzed largely contrast with the good preservation of most of the bones preserved at the CLDQ and their origin is not clear from your manuscript. I did not understand why and how they were incorporate to the sediments at the same time with the complete and well preserved other bones. Might be the remains of "bones crushed by larger animals, such as sauropods, attempting to escape the miring mud"? By the way, you should include much better images to show the degree of abrasion of the intramatrix fragments and the inferred different stages as well. JP: Better IBF images have been revised and included. We are proposing that when carcasses were washed into the deposit and skeletonized, many remains would be buried. However, remains that were not buried would become destroyed and produce small fragments - perhaps from trampling or from increased aridity causing splintering of exposed remains. Crushing from animals attempting to escape from miring is unlikely due to the wide dispersal of bone fragments. In situ crushing would result in concentrated pockets of bone fragments, which is not seen in the quarry.

And you saw the bones from where the fragments came on, fractured or incomplete? I am asking because I have no the reference in a clear-enough photograph.

I would like to see a photograph of the concretions that form nodules of calcite/barite around many of the bones from the CLDQ. JP: A photograph of a concreted bone has been added to Figure 7.

It is not as clear as I would want, but maybve if you add some labels would be okay.

Concerning the unusual elevated amount of heavy metals and rare elements in the sediments and bones, do you considered the possibility that at least part of them were integrated to the soils recently? Several anthropogenic activities from modern days (mining, agriculture, fossil fuel exploration and exploitation, industries, etc) are extremely persisting contaminating of the environments and As, Cr, Ba, U, Zn, among others, were detected. This is just a suggestion for inquiring; maybe doing additional analyses, but it seems to be a repetitive problem in EDS analyses and other chemical studies of ancient sediments. JP: Further chemical analyses are planned for future work at the CLDQ and these helpful suggestions will be taken into consideration. It is doubtful that anthropogenic activities or recent activities are the origin of the metals seen in the quarry due to their isolated concentration in the bonebed and not elsewhere in the Morrison exposures in the area. Furthermore, the active excavations at CLDQ are taking place within buildings, whereas our other sample sites are exposed to air. If mining-related metals were being transported via air or rain, they would more likely accumulate outside of CLDQ than within.

Not necessarily, because they might be there from before the bone bed was discovered. But, anyway, if you can prove that the rare elements are indeed syngenetic, you just have to try explain their origin, because sounds very uncommon that they were concentrated in such small area.

Other concerns:

Fig. 5 is still very dark and out of focus. It needs to be improved.

Fig. 6 must be increased/improved in quality in the way that the reviewers and the editor can be able to see what you are describing in the text. So, please, improve your figuring; it is very poor to support the nice succession of taphonomic stages that you present in figure 9.