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## Response to editor and referee

We thank the editor and referee for their thoughtful evaluation of our revised manuscript "Hotspots and hot moments of metal mobilization: dynamic connectivity in legacy mine waters" and for accepting our manuscript, subject to implementation of the minor revisions suggested by the referee. We are very grateful for the important clarifications the referees requested for, which we addressed when revising the manuscript.

**Referee #1:** I have reviewed the manuscript titled "Hotspots and Hot Moments of Metal Mobilization: Dynamic Connectivity in Legacy Mine Waters" by Sanchez et al. for the second time. The authors have conducted a thorough revision, improving readability and avoiding ambiguity in their terminology. They have also corrected their C-Q and hysteresis analysis to provide a more precise conceptual representation of potential export patterns (see Fig. 2). The manuscript provides valuable insights into the complex water quality dynamics at abandoned mining sites, breaking down this complexity into dominant processes and hot moments. I have no doubt that this work will be of great value to readers of HESS. I have a few very minor comments, which I will leave to the authors' discretion as to whether they wish to incorporate them, and I recommend publication thereafter.

Thank you very much indeed for your thoughtful evaluation of our revised manuscript. We see that there are minor technical revisions that should be incorporated. We have now addressed the comments in the lines presented below.

L368: 'Observed' might be a better term than 'exhibited' here?

Thank you for highlighting this. We see how "observed" may be a better term in the context of the sentence. We have now replaced the original term.

L392-396: For better readability, consider splitting this sentence into two.

Thanks for noting this. We agree that the sentence is very long and could be better written as two sentences. We have now amended this to improve clarity and readability.

Fig. 3, 4 and 5: I cannot see any red indicating 'recession' in these figures. Therefore, it could be removed from the legend.

We're thankful for this observation. We agree that while we identify a recession phase in our geochemical classification framework, we do not observe this phase when developing our figures 3-5. We have now removed "recession" from the legend and stated in the figure caption that recession is not included because it was not identified here. We hope this improves the clarity of the figures.

L524: One might add here that C-Q slopes have been shown to diverge between the event and long-term scales (Winter et al., 2024; <https://doi.org/10.1029/2024GL108437>). This demonstrates the importance of analyzing C-Q relationships on short time scales using high-frequency data, as this reveals processes that would otherwise remain hidden. The study presented is a good example of why it is important to observe event-scale dynamics using high-frequency data rather than just long-term patterns using low-frequency data, as explained further below (hence, this may also fit into the next chapter.)

Thanks for this suggestion. We agree that by integrating this point we can make our conceptual focus more explicit and our results and discussion section stronger. We have added this information in lines 522-524, as well as in the next section 3.4 in lines 572-573 where it also fits.

Thank you very much again to the editor and referee for your thoughtful evaluation of the revised manuscript and your very nice suggestions. Your comments helped us to improve the paper towards coherence and clarity.

Sincerely,

Anita Alexandra Sanchez and Conrad Jackisch  
(on behalf of all co-authors)