

Interactive comment on “Fossilized bioelectric wire – the trace fossil *Trichichnus*” by M. Kędzierski et al.

Anonymous Referee #1

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This is a very exciting research. The paper is very well-written and interesting and should be published with very minor revisions. It brings a new perspective on cable bacteria and nanocables over geologic time scales. Well done.

1. Note that the concept of biogeobattery was proved through geophysical measurements much before the Nielsen and Risgaard-Petersen (2012) by Naudet, V., A. Revil, J.-Y. Bottero, and P. Bégassat, Relationship between self-potential (SP) signals and redox conditions in contaminated groundwater, *Geophys. Res. Lett.*, 30(21), 2091, doi: 10.1029/2003GL018096, 2003; Naudet, V., A. Revil, E. Rizzo, J.-Y. Bottero, and P. Bégassat, Groundwater redox conditions and conductivity in a contaminant plume from geoelectrical investigations, *Hydrology and Earth System Sciences (HESS)*, 8(1), 8-22, 2004; Naudet, V. and A. Revil, A sandbox experiment of the rela-

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tionship between redox and self-potential and its application to the interpretation of self-potential data over contaminant plumes, *Geophysical Research Letters*, 32, L11405, doi: 10.1029/2005GL022735, 2005; Linde, N., and A. Revil, Inverting self-potential data Especially, p 17712, the occurrence of self-potential associated with the biogeobattery concept was proposed before the cited papers in the papers mentioned above.

2. The introduction implies that the results from Nielsen and Risgaard-Petersen (2012) are related to microcable (or nanowires). This is not the case: it has been shown that they are related to cable bacteria, see details in Risgaard-Petersen, N., L. R. Damgaard, A. Revil, and L. P. Nielsen, Mapping electron sources and sinks in a marine biogeobattery, *Journal of Geophysical Research Biogeosciences*, 119(8), 1475–1486, doi:10.1002/2014JG002673, 2014.

3. Figure 3 is great, but does not show the half-redox reactions. Note it is also possible that these bacteria are using pyrite to exchange electrons and support indeed the idea of a collaboration between these bacteria and the mineralogy. This idea was actually proposed in Naudet et al. (2003, 2004) much before the references you cite.

4. Conclusion 1: about the electrical circuit, I think a better reference is Risgaard-Petersen, N., L. R. Damgaard, A. Revil, and L. P. Nielsen, Mapping electron sources and sinks in a marine biogeobattery, *Journal of Geophysical Research Biogeosciences*, 119(8), 1475–1486, doi:10.1002/2014JG002673, 2014.

5. Lovely or Lovley, please double check.

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