

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 biogeo-battery 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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