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Interactive comment on "Time domain reflectometry (TDR) for dielectric characterization of olive mill wastewater (OMW) contaminated soils" *by* Alessandro Comegna et al.

Anonymous Referee #2

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The paper presents a methodology for a practical application of TDR to identify olive mill wastewater contaminated soils. I find the method to have potential, but, as most empirical models, it has some significant limitations. I encourage the authors to address and discuss these limitations in the revised manuscript.

1) Because this model is based only on EC, in field applications, it seems that other more benign sources of salinity may be confused for olive mill wastewater (OMW). What are the constituents in OMW that cause it to increase the TDR-measured bulk EC - only inorganic salts? On line 105, you mention that polyphenols were measured, but do not present these results in the paper - why? Are polyphenols relevant to this

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model?

If it is only dissolved salts in the OMW, then the methodology you developed is best applied as a OMW contamination screening tool to identify soils that are potentially contaminated (i.e., contamination requires confirmation by other tests), rather than a direct OMW detection tool. In other words, more discussion on the limitations of this model is required.

2) I think it is possible that another approach to modeling your dataset was presented by Rhoades (see citations below) or potentially Hillhorst (2000). I encourage the authors to explore the similarities of their empirical model with other theoretical or semi-empirical models available in the literature. There is a possibility to quantify the increase in bulk soil EC to the EC of the OMW itself.

Rhoades, J. D., P. A. Raats, and R. J. Prather. 1976. Effects of liquid-phase electrical conductivity, water content, and surface conductivity on bulk soil electrical conductivity. Soil Sci. Soc. Am. J. 40:651-655.

Rhoades, J. D., N. A. Manteghi, P. J. Shouse, and W. J. Alves. 1989. Soil electrical conductivity and soil salinity: new formulation and calibration. Soil Sci. Soc. Am. J. 53:433-439.

Hilhorst M.A. 2000. A pore water conductivity sensor. Soil Sci. Soc. Am. J. 64:1922-1925.

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