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Drinking Water Engineering and Science Discussions

Interactive comment on "NOM characterization and removal at six Southern African water treatment plants" *by* J. Haarhoff et al.

Anonymous Referee #2

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The paper describes the characterization and removal of NOM at water treatment plants in South Africa. The character of NOM is important since it determines the treatment steps that are necessary to remove the relevant fractions. In this paper an attempt is made to summarize different characterization methods and evaluate the value for practical application. It is an interesting study and in the opinion of the reviewer this type of research is not performed earlier. However, some comments could be made and these are summarized below:

General comments: - In general, the paper is somewhat under-referenced. Many statements are made without mentioning the source or examples. Examples are: line 1-5 on page 233, line 9-12 on page 237, line 20-22 on page 237, line 5-7 on page 244. - Definition problems occur with respect to hydrophobic and hydrophilic fractions. On

page 241 and 244 the humic fraction part is defined as hydrophilic, whereas on page 243 the same fraction is defined as hydrophobic. In my opinion the latter is right. This means that the definitions on page 241 has to be revised. - In the paper no comparison is made of the different methods. It would have been valuable when this was incorporated in the paper. - Consider leaving out the section "Further work" (also in abstract) since it does not contribute much to the paper. The first paragraph of this section could be incorporated in the "conclusions" section. - The legends of Fig 2 should be revised (now all fractions are "hydrophobic").

Specific comments: - Pg 233 line 9: should be "DOC is organic matter, measured as C in mg/L, passing. . .". - Pg 236, line 20: Explain to what level DOC should be removed (since it is an important operational objective). - Pg 236 line 24-25: explain what the abbreviations mean (now this is only done on page 239). - Pg 237 line 1: give examples of the strong differences in the NOM composition - Pg 237 line 26: this statement is very general. In many cases the biodegradable NOM (BDOC) is less 10% of the total NOM concentration. AOC is expressed as μg/L (typically between 10 and 100) which can be less than 1% of total DOC. - Pg 239 line 5-15: refer to Table 2. - Pg 240 line 1-7: When there is 100% removal of BDOC (which is already remarkable), then an increase of 34% of BDOC by O3 does not correspond to a decrease of 34% by BAC. - Pg 242 line 1: PS < 5%. This is a small fraction. Therefore I think it is difficult to say something about the removal percentages (Table 5), also because of the (lack) of accuracy of the measurement technique. - Pg 242 line 9: I do not know situations where NOM adsorbs on a sand filter. Is it not possible that biological degradation takes place? - Pg 242 line 13-17: HS can be transformed into BB. This means that when the two fractions are aggregated information is lost. - Pg 242 line 19: It can be concluded that biological degradation of NOM is inhibited. Is it possible that still some residual ozone is left in the water? - Pg 242 line 22: probably GAC works here as BAC as well. - Pg 243 line 2: "hydrophilic" must be "hydrophobic" - Pg 248 line 12: This article is also published in WST.