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Drinking Water Engineering and Science Discussions

Interactive comment on "NOM removal technologies – Norwegian experiences" *by* H. Ødegaard et al.

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General comments: The paper gives extensive and practical information on treatment of waters with high colour, which is generally attributed to the humic content, in the context of the Norwegian experience. The information provided could be very useful to drinking water treatment practitioners as well as researchers interested in the removal of humic NOM from drinking water. However, the emphasis on the use of colour as a measure of humic content of the waters does not do justice to the title of the paper, which mentions NOM removal in general. It would have been less confusing if more data was given in terms of DOC concentrations, which is a more accepted measure of NOM content. Furthermore, since colour reduction is not an accurate representation of removal of humics, especially during oxidation processes such as ozonation, NOM

characterization tools would have more clearly quantified the humic content of the waters used in the studies, and would have, therefore, permited the evaluation of actual removal of NOM.

Specific comments: Page 2: line 21, "competes with taste and odour"-is it meant here the compounds causing these?; line 26, the lower limit of the molecular weight of humic substances given is rather high; fulvic acids are the major components in natural waters and range in molecular weight between 1000 and 2000 ((Thurman, 1985). Is the larger size characteristic of Norwegian waters? Page 4: line26, it would be more helpful if actual figures for high NOM-content/colour and low turbidity were provided. Page 12: line 14, is possible to specify the NOM-content that would be considered high in this case?; Page 13: line 1, "biologically stabilize"= "improve biostability of", since there are some cases of bio-instability of water from treatment plants employing biofiltration; line 10, are there results to demonstrate biostability of the water produced?; line 20 a recommendation with specific figures for "medium to low NOM" content would be helpful. Page 15: line 24, specific figures for high NOM concentration and colour should be given. Page 16: line13, it is not clear what method/process is being compared with sorption processes in terms of use.

Technical corrections: Page 2: line 19, "increase"= "increases"; line 20, define GAC/PAC; line 24, "are influencing on"= "influence"; line 26, "the humic"= "humic". Page 3: line 16, delete "already". Page 4, line 13, ";"= ":"; "caused by to"= "caused by too". Page 5: line 1, insert "," after concentration; lines 12 to 15 need rewriting for more clarity. Page 6: line 27, "ability of coagulate"= "efficacy of coagulation". Page 8: line11, "As mentioned above"- I could not find where; line 28, "influence on"= "influence". Page 9: line3, "filter must" or "should"?; line 4 " filter rate"= "filtration rate"; line 8, "filter cycle"= "filtration cycle"; line17, define PACl and "flux of ca 80 L/m2h"= "flux of 80 L/m2h". Page10: line 23, "ozon which is selectively targeting mainly" = "ozone, which selectively targets"; line 25, "very"="more". Page 11: line 24, "water results however, also in" = "water, however, also results in"; line 25, delete themselves. Page 12: line5,

“the 2.”=”the second”. Page 13: line 7, “,” after (NTNU); line 13, “approx. 400 hrs”= “approximately 400 h. Page 15: line10, “carried out”=“and in”; line16, “in”=“on”; line 17, “hydrophobic and”= “hydrophobicity”; line18, “of”= “for”. Page 16: line 3, “are”= “is”; line7, “take the growth potential out”= “minimize the biogrowth potential”; line 10, “only adviced” = “recommended”; line 17, “at”= “for”.

Interactive comment on Drink. Water Eng. Sci. Discuss., 2, 161, 2009.