Interactive comment on "Abnormal quality detection and isolation in water distribution networks using simulation models" *by* F. Nejjari et al.

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i) While the approach that has been used in the study is useful in determination of the fault in the distribution network, no discussion or explanation has been presented regarding the location and number of sensors locations in the network. The sensor location is very important parameter in this kind of study, and sensor location and number of sensors should be optimized to provide satisfactory coverage of the network. For example, if figures 2, 3 and 5 were combined, it may reveal that the faulty links were detected in the close proximity to the sensors.

We agree that this is an important aspect that could be tackled when designing the

network in order to improve the detection performance so that the contamination risk is minimized. However, in this paper it is assumed that the set of sensors are already installed in the network. Thus, this paper focuses on the development of an abnormal water quality localization methodology for a given set of sensors and identifying their location is beyond the scope of this paper. We are aware of the importance of sensor location in water distribution networks. In [1] a methodology was developed to determine the optimal placement of sensors in order to maximize the leakage detection and location. A conclusion drawn from this study was that the detection performance improves with the number of sensors, but there is an upper bound on the number of sensors necessary to maximize it. We are confident that this methodology could be also applied here to assure maximum water quality monitoring coverage.

ii) As well, it is important to provide the readers with the information about sensors such as their sensitivity, detection level and false positive rates. There should be some approach to avoid false positives due to sensor error.

These issues have not been addressed in this paper but we are currently developing methodologies that take into account modeling uncertainty in order to minimize false positive rates.

[1] R. Perez, V. Puig, J. Pascual, J. Quevedo, E. Landeros, and A. Peralta, "Methodology for leakage isolation using pressure sensitivity analysis in water distribution networks," Control Engineering Practice, vol. 19, no. 10, pp. 1157 – 1167, 2011.

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