We are thankful to Reviewer_1 for constructive comments, which helped us to improve the overall quality of manuscript. To address the reviewer concerns, we have made significant changes in section 2 and section 3 of manuscript. For convenience, the reviewer's comments are kept as it is, while author response are kept in italics.

GENERAL COMMENTS:
1. Section 2.3.1 proposed a fuzzy approach for the water quality decision support system. However, in Section 3 there is little result analysis or discussion about the results of applying fuzzy logic to the collected live data. The code included in the supplemental materials does not show the application of fuzzy logic, either. Readers would benefit from descriptive text and/or figures showing how the fuzzy approach classifies water quality data at the 5 sites into the 3 proposed categories of NA, ADE, and HACC, and what advantages the fuzzy approach has over other algorithmic classifiers or empirical methods.

    a. [In Section 3 there is little result analysis or discussion about the results of applying fuzzy logic to the collected live data. The code included in the supplemental materials does not show the application of fuzzy logic, either.

    Reply
    In compliance with reviewers comment, the following amendments have been carried out.

    o   *In Section 2.3, Text of Decision Support System has been improved with additional details and the fuzzy Rules have been clarified in revised manuscript. Similarly, the approach of applying fuzzy inference have been depicted in additional figure no 3 of revised manuscript. Please refer figure number 3 in author Comment (AC 1) section that demonstrate how to apply fuzzy rules over data points. Additional supplement material have been added in short Comment (SC1) with file that mention all the fuzzy rules. As far as code is concerned, the Python code utilizing the functionalities of Skfuzzy library has been included in supplementary material ([Link](#)), which shows the application of fuzzy through Python.*

    b. [Readers would benefit from descriptive text and/or figures showing how the fuzzy approach classifies water quality data at the 5 sites into the 3 proposed categories of NA, ADE, and HACC]
    Additional descriptive text has been introduced in revised manuscript. Moreover, additional figure has been added to show the interpretation of fuzzy rule (refer AC1 figure 3, or refer fig 3 of revised manuscript). This figure depicts, how fuzzy approach classify water quality and support decision making.

    c. [and what advantages the fuzzy approach has over other algorithmic classifiers or empirical methods.]
    o   *Additional text has been added in revised manuscript with Section 2.3. This particular text paragraph demonstrate the superiority of fuzzy over PCA and other regression methods. The text is mentioned below is part of revised manuscript with additional references.*

    "Literature review indicates, fuzzy perform better than both linear and non-linear regression methods in terms of model building, adaptive modelling and decision making (Doorsy and Coovert, 2003). Although, Principal Component Analysis (PCA) is also one of the favorite tool for information extraction and analysis. However, PCA is sensitive to missing data and poor correlation among water quality parameters (Sarbu and Pop, 2005). Moreover, fuzzy offers simplicity, flexibility, reliable results, can handle incomplete data sets and nonlinear functions. Therefore, Fuzzy has been extensively used in development of decision support system for applications pertaining to water and CPS. This approach have been widely discussed in several environmental applications ranging from development of decision support system based for 45 urban water management (Macropoulas et al., 2003) to Fuzzy based CPS system (Leu and Zhang, 2009)".

    o   *Similarly, Additional text in section 2.3 included demonstrating comparison of Python with MATLAB in context of manuscript.*

2. The Conclusion section reads "The proposed system can be implemented in remote locations and unlike commercially available analyzers, the developed system is low cost, low power, lightweight and capable to process, log, and remotely present data." However, the article does not compare the (estimated) costs, power consumption, or weights, of the proposed system and commercial systems.

    Reply:

    (a) [However, the article does not compare the (estimated) costs of the proposed system and commercial systems]
    Additional text, Section 2.4 Comparative Analysis of System Cost has been added to revised manuscript to present estimated cost and comparison. The text is as follows:

    "Commercially available multiparameter water quality monitoring system (eg. YSI Sonde V2) varies in the range of 5000 US $ to 8000 US $ (with computing framework) mainly used for Industrial purpose. On the other side, general purpose sensor nodes of commercially available Vernier cost around 800 US$ to 1000 US$ (without computing framework) for potable water testing. The cost of commercially available computing tools (eg. MATLAB and LoggerPro) varies in the range of 350 US$ to 500 US$. By exploiting the benefits of open source computing modules and libraries, the overall system cost can significantly be lower down. For proposed system, the cost of sensor array is summation of individual cost of pH, DO, ORP, EC and Temperature nodes and was 530 US$. In addition, the hardware platform has a cost of 59 US$, which includes Arduino MEGA 2560 and XBee (wireless data transmission unit). Therefore, overall cost of sensors and hardware unit was 589 US $. The cost of consumables, data collection, power source, scientific supervision, labor, resources used for sample collection and shipping to analytical laboratories has not been taken into account, as it will be approximately same for all other commercially available systems".

    (b) [For power consumption and weight]
    The power consumption and weight has been mentioned in revised manuscript section 2.2. We have decided to opt for light weight hardware platform unit with low power requirements of 5-15 V. The Sensor Array operates on the power ranging from 5-12 V, therefore low power platform unit is sufficient for overall operations and simultaneously can be supported by Li-Ion batteries.

Other Comments:
1. Page 1, Line 17. "socially acceptable means to detect... contamination". Suggest clarifying the meaning of "social acceptance" in the context of water quality monitoring systems.
    Reply: Socially acceptable term has been removed from the revised manuscript, as Social Acceptance is wide ranging term outlining societal cooperation and contribution to various other economic factors. Since, the proposed paper do not cover such issues, except cost analysis. Therefore, this term "socially acceptable" has been removed from the text.

2. Page 1, Line 24-25. "Statistics show that 20-60% of water contamination incidents are related to events in the water distribution network". References are needed here.
    Reply: Authors are thankful to reviewer to rectify this mistake. The line has been removed from the text of revised manuscript.

3. Table 1 shows that for DO values, range for portable water is " >3mg/L". However, if groundwater is used as water source, regular DO values are usually lower than 3 mg/L. See, e.g., Sarin, P., et al (2004). Same comments for the DO ranges in Table 3.
    Reply: Very low D.O. is indicative of too many bacteria and excess BOD. On the other hand very high D.O. corroborated the rate of corrosion in distribution pipes leading to contamination. In Contrast, Groundwater at excess depth may have D.O. < 3mg/lit even without being contaminated. Since D.O is variable with temperature, therefore, from groundwater extraction to distribution the levels of D.O may vary. Still, it should not be very low for human consumption, as in general sense very low D.O. is indicative of water contamination.
    Reference: Causes of low Dissolved Oxygen (https://www.pca.state.mn.us/sites/default/files/wq-iw3-24.pdf)

4. Page 2, Line 19. "Aurdino mega 2560 microcontroller...". Is this "Arduino"?
   Reply: Arduino (Mistake Rectified)

5. Table 2. Suggest removing the column of "manufacturer". It has been mentioned in the main text.
   Reply: In compliance with suggestions, we have removed the column.

6. Page 3, Line 45. Suggest numbering the supplemental materials and refer to them in the text by numbers.
   Reply: All Supplementary material file names has been renamed and now referred by numbers in text of revised manuscript.

7. Page 4. Line 10-14. Are there only two rules? if not, suggest listing all rules.
   Reply: Rules have been clarified in revised manuscript. Additional supplement material have been added with file name 4. Supplumentary_Material_4.pdf. Moreover, additional text has been added to improve the clarity of rules in section 2.3.

8. Page 4. Table 4. Suggest adding a column showing the Mean Average Percentage Error (MAPE) of measurements for the proposed system versus lab results.
   Reply: Extra table have been added for MAPE for all the five parameters with graphical representation. Utmost care has been taken while collecting the samples from SA (Sensor Array) and Laboratory samples. SA incorporate Industry manufactures sensors, and we do not have any control over their values except repeated calibrations from already known samples. Please refer fig 6 in Author Comment 1 that depict MAPE of SA. We have also included the same MAPE figure in revised manuscript in place of Radar Chart.

9. Page 6, Line 18. What does PLS stands for? Abbreviations should be spelled out on first occurrence.
   Reply: PLS stands for Partial Least Square. The mistake has been rectified in revised manuscript with all the abbreviations.

10. How long did the system run at the 5 sites? how many measurements are taken in total? How was the system powered on site? It may also be beneficial to include raw data in the supplemental materials.
    Reply: Additional paragraph has been added in revised manuscript labelled as section 3.1.2 to mention the procedure, numbers of cycles and time duration for the system. The power method is mentioned in section 2.1.2 of revised manuscript. As far as raw data is concerned, we have generated thousands of Data points through different iterations, which is not possible to include due to huge numbers. However, we will include file named Supplementary_material_7.pdf for to show the results of one iterations.

    Comments on the figures:
    Figure 1. The text size is too small to read. Suggest increasing the size and removing the grey background.
    Reply: Grey background has been removed and text size has been improved.

    Figure 2. X-axis is not shown.
    Reply: Shown

    Figure 3. Radar chart usually shows different types (rather than sites) of measurements on the axes (See Figure 5, Lambrou et. al. 2014). Suggest re-plotting to have 5 charts for 5 sites.
    Reply: Earlier Radar charts have been removed and replaced by MAPE chart for all the five locations. Please Refer figure 6 in AC 1 for MAPE calculations.