

## ***Interactive comment on* “Evaluation of human risks of surface and groundwater contaminated with Cd and Pb south of El-Minya Governorate, Egypt” by Salman Salman et al.**

**Salman Salman et al.**

asmoay@gmail.com

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Dear Reviewer, We are very grateful for those worthy comments. We took these comments in our consideration and the response as the following:- 1) The value of this risk is not emphasized, as it was calculated only for the groundwater that be used with unidentified inhabitants and the treatment of the surface water did not put into account. Risk has calculated for surface water and listed in Table No 4 in our article and discussed in pages 7&8. Unfortunately, the applied treatment techniques (flocculation and coagulation with alum) in drinking water stations (Donia 2007) in the study area are ineffective for the removal of toxic metals (Fatoki and Ogunfowokan 2002). 2) In

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the Abstract, authors referred to the hazard index (the summation of HQ) (Page 1, Line 15), while there is no information in the whole manuscript about this parameter and how they calculate it. The hazard quotient (HQ) was mentioned in the material and method in page 4 lines 10-16 and calculated using equations 1&2. 3) In the Introduction: # (Page 3, Line 10), the aim should be the same as written in the Abstract. Also, authors did not show the novelty of the work. What is done before in risk assessment research work? # (Page 3, Line 22 until the end of the paragraph) the description of the nature of rocks and stones in the area did not connected with the presence of the Cd and Pb problem. -The aim was rewritten as the abstract. This work (health risk assessment) is a new in Egypt didn't apply before, the previous works dealt with comparison with national and international drinking water guidelines. -The description of rocks was deleted and only short description of aquifer and geology was written. 4) Materials and Methods: # (Page 4, Line 14) the samples were taken in November 2014. The results must be up-to-date, unless the authors mention that there is no action or changing for the situation yet. # Authors mentioned that they filtered the collected samples and then digested them with nitric acid. This is give the concentration of heavy metals in the water filtrate (dissolved heavy metals). The samples should acidified first or digested and then filtered to have the total and exact heavy metal concentration. Also, the standard method that they refer for this analysis is not up-to-date. APHA, 2017 is recommended. # (Page 5, Line 5), the exposure frequency is 350 day/year. # (Page 5, Line 6), how much lifetime is used for the calculations? # (Equation 3), the slope factor (SF) is not defined and the reference for SF values used for Cd and Pb is missed. -This work is part of PhD thesis has been awarded in 2017, and the problem is still now. - Samples acidified (pH < 2) with nitric acid to prevent precipitation, microbial activity and sorption losses to container walls. Page 4, line 5. - APHA (1995) book is the available at our lab. -The life time is the average of human age is about 65 year for adults and 6.5 year for children. Page 4 lines 24-25 -The reference of slope factor is USEPA (2011) is referred it in page 4 line 23. 5) Results and Discussion # (Page 6, Line 5), Why the Cd concentrations in the River Nile (S6, S7) are lower than that for River Nile (S2,

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S3)? While S2 and S3 are from the southern part and even S6 and S7 sites are near to Abu Qurqas Sugar Factory. Authors claim that this Sugar Factory is a source of Cd pollutants. # Authors did not explain the source of Pb in the River Nile, especially at S2 and S3 sites. # S4 appears in the map (Fig. 1) as a canal site and written in the Table 2 as a drain site. # Authors refer in Page 5, Line 17 to the unity of Cd and Pb source and they mentioned in the same page 5, Line 23 that the agricultural activities (Fertilizers and pesticides) are the main sources for Cd. Then they mentioned in Page 6 Line 21 that the Cd and Pb concentrations in the River Nile and canals are higher than that in the drains. They explained that due to the high human activities. Actually, what is the main source of Cd and Pb pollution? # What is the source of Pb in the River Nile samples (S2&S3)? # The area under study is covered by drinking water distribution network. There is no information about that. In Page 7, Line 4, how many inhabitants not covered by the DW network and safe potable water? And how they are far from the distribution system? # Why the levels of Cd and Pb in the groundwater sites near to the Western Deseret Road are close to that in River Nile while these wells are far from the River by about 25 Km and far from the canal (Bahr El Youssif) by about 15 Km. # The health risk assessment in this research article is based only on the exposure of some inhabitants in some villages on the study area with Cd and Pb via ingestion of contaminated groundwater. The study ignored the contact with the surface water in irrigation activities and did not give full picture for the potable water resources, especially that there are water treatment facilities covering the area. # The resolution of maps is so low -Sample No S2 and S7 were collected from the canals and samples No S3 and S6 are collected from the River Nile stream as listed in Table 2. The levels of metals depend on the place of sample where some samples taken near navigation sites and residential areas which cause more pollution. (S6) and canal (S7) which not connected by the Sugar Factory outlet despite it is located near the Factory. -S4 (Al Sellic Drain) is very close to Al Ibrahimayah canals (about 50 meters), so this drain not appears on the map. -The authors mean by unity that these metals come from anthropogenic activities. These activities include the application of agrochemi-

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cals (fertilizers, herbicides and pesticides), vehicle exhaust, urban runoff and industrial activities. - The study area covered by drinking water distribution network but some rural areas which contain thousands of residents aren't on this network. Also, the applied treatment techniques (flocculation and coagulation with alum) in drinking water stations (Donia 2007) in the study area are ineffective for the removal of toxic metals (Fatoki and Ogunfowokan 2002). In addition the desert area doesn't have drinking water network. Page 7 lines 14-16 -The source of Pb in the River Nile samples (S3) and Al Sawahliyah canal (S2) is urban runoff and vehicle exhaust. -The level of Cd and Pb are nearly homogenous in groundwater of the study area except some hot spots as a result of unconfined and great vulnerability of aquifer in the desert area and great polluting activities in the old cultivated land. - This work dealt with the use of water for drinking and we take into consideration the surface water risk. - The resolution of maps enhanced. We made low resolution for upload problem. 6) The number of references (40) is so high for research article. The increased number of references was a result of my discussion with my colleagues in my lab to support my interpretation but your advice to reduce the references was taken in consideration (references reduced to 32 references).

Please also note the supplement to this comment:

<https://www.drink-water-eng-sci-discuss.net/dwes-2018-37/dwes-2018-37-AC7-supplement.pdf>

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