

## ***Interactive comment on “Polycyclic aromatic hydrocarbon in urban soils of the Eastern European megalopolis: distribution, source identification and cancer risk evaluation” by George Avtandilovich Shamilishvily et al.***

**George Avtandilovich Shamilishvily et al.**

george199207@mail.ru

Received and published: 22 December 2017

Dear reviewer, thank you for your labor and patience, we have tried to respond to all your comments:

\_\_\_\_\_ The manuscript is devoted to the actual topic of polycyclic aromatic hydrocarbons (PAH) pollution of urban soils in cities. This is up to date research compelling the lack of data on PAH distribution and cancer risk evaluation in Saint-Petersburg – one of the largest cities in the Eastern Europe. I would suggest this manuscript to be published after the major revision. 1. The key result of the manuscript

C1

is quite questionable – “Total PAH concentrations . . . showed no significant differences between land utilization types” (Line 18-19). A lot of published researches prove the opposite finding – clear differentiation between zones (parkland, residential, industrial) exists. To my mind the absence of differentiation may be driven by the specific of sampling procedure – may be the soil samples were excavated in the vicinity of highways/roads in all the zones. The procedure of sampling is not clearly described by the authors – the dense of road system and the distance from the roads of every sampling plots should be specified as must for every zone. 1. Please, provide the detailed scheme/map of sampling sites putting sampling plots on it. Highways/roads location (the distance from the roads to sampling plots, the distance between sampling plots) should be clear, production plants location and dominating wind directions should be specified. Fig . 1 is not informative and too small to realize the location of sampling plots in road and production plants system. - We have redesigned figure 1, made it even bigger and understandable, divided it to fig 1 a, b, c parts showing each study area individually with sampling plots, roads and production plants location clearly marked.

2. Poor characteristics of soil sampling sites and absence of information on soil sampling plots – their location specific (distance from roads as mentioned above), traffic intensity of closest roads, dominating wind direction, vegetation type, relief and landscape specific, population density (Line 105 and further).

- We have added detailed information on the sampling plots to the supplementary materials, now it looks like 3 big tablets.

3. Sampling strategy and procedure (Line 120) is not clear and should be rewritten:

3.1. Specify quantity of sampling plots - added missing information according to suggestion;

3.2. Specify distance between sampling plots within sampling site and between them - added missing information according to suggestion;

C2

3.3. Was the sampling depth different at sites - it was common 0-20 cm, we specified it in the text;

– what does mean the phrase “Soil depth selected for sampling. . .” (Line 128-130) - we rephrased this sentence to: "Depth of sampling is a function of exposure routes..."

3.4. What is behind the phrase “Sampling pattern. . .” (Line 130-132) and “This technique enables. . .” (Line 140-141). - Replaced “Sampling pattern. . .” with "Sampling scheme" and “This technique enables. . .” with "This method allows to prevent".

3.5. Specify the weight/volume of one “initial” soil sample excavated within sampling plot before mixing (average sample formation) - added missing information according to suggestion;

3.6. Was the quantity of samples within all the sampling plots the same - nope, it differed.

3.7. As I understood it was 3 different sampling plots per functional zone in sampling site. Why the GPS location is only one per zone in Fig 1-description? - No, the quantity of sampling plots ranged between 2 and 5, we added missing information and specified it in the text.

4. Lines 188-198 – should be moved to Results and discussion section - corrected according to suggestions.

5. Line 220-221 is in conflict with Line 17-19 (“Total PAH”). Please, explain - we are sorry for this mistake, our colleague put old data, the given p values in table 3 and conclusions in the text in this redaction of manuscript was not actual, this was only for Primorskiy district, this conclusion and p values in table 3 are from the previous version of our manuscript, when comparison was made between studied districts nor the land uses, now we have grouped data for each land use type from all the studied districts together to create a bigger dataset for One-Way ANOVA. Differences in total PAHs and 7PAHs tend to be significant from this point of view. We added actual p values in tablet

C3

3 and revised conclusions in the text.

6. The structuring of the manuscript should be improved to make it more logical and clear in line with key objective/aim – to test the hypothesis on the PAH loading differences between urban territories of different use scenarios (functional zones). I would suggest to structure all the sections in Results and discussion part in the common way: 1 – key findings prior to different zones, 2 – discussion - checked

7. Line 276 “Determination of the PAH sources and statistics”. Why “statistics” is highlighted in this section? Statistics relates to all the sections – does not it? - it does, divided it to individual section.

8. Conclusions should be revised prior the above comments - checked

9. Technical remarks: 10.1 Line 1: hydrocarbons instead of hydrocarbon - checked

10.2 Line 123-124: no noun to “were combined” - checked

10.3 Fig.2 – no need, it is general knowledge - checked

10.4 Fig. 1-description: Primorskiy and other names instead of Primorskij - checked

Please also note the supplement to this comment:

<https://www.solid-earth-discuss.net/se-2017-54/se-2017-54-AC12-supplement.zip>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2017-54>, 2017.

C4