U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 2

October 4, 2018

BY ELECTRONIC MAIL

Robert Law, Ph.D.
de maximis, inc.
186 Center Street, Suite 290
Clinton, New Jersey 08809

Re: Draft the 2012 Fish Tissue Survey and Chemistry Background Data for the Lower Passaic River Study Area, dated July 22, 2015

Dear Dr. Law:

The U.S. Environmental Protection Agency (EPA) has reviewed the *2012 Fish Tissue Survey and Chemistry Background Data for the Lower Passaic River Study Area*, dated July 22, 2015, prepared by Windward Environmental LLC on behalf of the Cooperating Parties Group (CPG).

EPA is providing the enclosed comments on the CPG's revised data report with this letter in accordance with Section X, Paragraph 44(d) of the Agreement. Please proceed with revisions to the data report within 30 days consistent with the enclosed comments. If there are any questions or clarifications needed, please contact me to discuss.

Sincerely,

Diane Salkie, Remedial Project Manager
Lower Passaic River Study Area RI/FS

Cc: Zizila, F. (EPA)
Sivak, M. (EPA)
Hyatt, B. (CPG)
Otto, W. (CPG)

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No.	Section	Comments
1	Pages iv-vi, Figures	The titles for Figures 6-11, 6-15, 6-16, 6-17, and 6-20 do not match the titles on the figures themselves. Please revise the titles for consistency. In addition, please correct the following: - For Figure 6-2, add a space between "concentrations for." - For Figure 6-39, remove the comma after "whole-body." Figure 4-51 should be Figure 6-51.
2	Pages vii-viii, Acronyms	Please make the following revisions: - The acronym "CPUE" is not used in the text. Please remove this acronym from the list. - Please add the definition for "UJ" to the acronym list. "USEPA" and "Windward" should be defined at their first use in the text, both on page 1.
3	Page 2, Section 1.1, second bullet	Please clarify what "qualitative results" were interpreted using the fish health condition data.
4	Page 2, Section 1.2, first bullet	Please revise the title of Section 2 in this bullet to "Field Methods" to match the title of the section in the report.
5	Page 7, Figure 2-1	Please revise this figure as follows: - Revise the legend so that the symbols for "River Mile," "River," and "LPRSA" are not listed under the heading "Fish sampling locations (Collection method)." - Revise the legend so that the symbols for "Reach 9" and "Reach 10" are not listed under the heading "Tissue." Ensure that all text (i.e., the service layer credits) fits within the border of the figure.
6	Page 9, Section 2.2, first paragraph, second sentence	Seines and angling are not described in the standard operating procedures (SOPs) referenced in this sentence. Please revise this paragraph to clarify what SOPs were followed for seines and angling.
7	Page 9, Section 2.2, second paragraph, second sentence	The sentence states that "Gillnets were generally positioned across the river, but closer to one bank than the other, with the exception of two gillnet locations, UPR09E and UPR10D." However, Figure 2-1 only shows four total gillnet locations, meaning that these two locations represent half of the total gillnet locations rather than "exceptions." Please revise the text accordingly.
8	Page 9, Table 2-1	Please revise the table as follows: - For boat electrofishing, 6 sampling locations are listed for Reach 10, but only 5 locations are shown in Figure 2-1. Please clarify. - Footnote "a" states that angling locations were recorded only when successful. Please clarify whether this is true for other sampling methods as well, and if not, why a different procedure is followed for angling than for other fish collection methods. Please add a footnote to the table to clarify that the eel trap, minnow trap, and trotline sampling locations each included three traps.
9	Page 10, Table 2-2	Please revise the table as follows: - Please add a footnote to clarify the water depth data (i.e., is the first number shown always the depth at the start of sampling?). - Please add the definitions for "µS/cm" and "ft" to the footnotes. Please clarify why the water depth was not recorded on 10/10/2012.

No.	Section	Comments
10	Page 11, Section 2.2, first paragraph after Table 2-2, first sentence	Please revise the text to note any exceptions to the statement that fish were retained "until a sufficient mass of that species was collected."
11	Page 11, Section 2.3, first paragraph	Please revise this paragraph for clarity. The first sentence states that the pathology evaluation was conducted on "the first five specimens of each fish species collected." However, the following sentence states that "target species were prioritized for tissue chemistry analysis over the pathology evaluation." These two statements appear contradictory and need to be clarified.
12	Page 11, Section 2.3, second paragraph, first sentence	Please correct the typo "barbells" to "barbels."
13	Page 11, Section 2.3, second paragraph, fifth sentence	Please revise this sentence to indicate where the completed Specimen Data Forms can be found.
14	Page 11, Section 2.3, second paragraph, sixth sentence	Please revise this sentence to indicate where the calculations regarding total number and percentage of specimens exhibiting lesions can be found.
15	Page 13, Section 3, second paragraph, first sentence	This sentence states that Appendix G identifies those fish specimens "retained for possible tissue analysis." Please clarify how this information is presented in Appendix G, which includes only "composite candidate" in the "Data Use" column for tissue analysis, and no indication of individual tissue samples.
16	Page 13, Section 3, third paragraph, second sentence	Please correct the typo in the scientific name for white sucker. *Catastomus commersoni* should be changed to *Catostomus commersonii*. Please make this change throughout the document and appendices as needed (e.g., Table 3-1).
17	Page 14, Table 3-1	Please make the following revisions to the table: - Please remove footnote "b." Crayfish and turtles are not shown in the table. - Please delete the definition of "na" from the footnotes as this acronym is not used in the table. CDM Smith's oversight report indicated that striped killifish were caught during the week of October 8, 2012. However, striped killifish do not appear in the table. Please clarify whether any striped killifish were caught during this sampling effort.
18	Page 15, Section 4, second paragraph, second sentence	Please revise the text to clarify how the 46 fish were selected for the pathology evaluation. In addition, a review of Figure 4-1 indicates that only one tessellated darter specimen was collected, rather than five. Please revise the text to explain why only one tessellated darter specimen was collected, rather than five, as the text previously indicated that five of each species were evaluated.
19	Page 15, Section 4, second paragraph, fourth sentence	The text states that 7 fish had one or more external abnormality and 13 fish had one or more internal abnormality. This adds up to the total of 20 fish that were found to have one or more external and/or internal abnormality, as stated in the previous sentence, implying that no specimens had both internal and external abnormalities. However, the previous sentence states that some fish had "both external and internal abnormalities." Please revise the text to clarify the number of fish that had both external and internal abnormalities.

No.	Section	Comments
20	Page 17, Figure 4-1	Please revise this figure as follows: - Remove "Tissue" from the legend as it is unclear why "Reach 9" and "Reach 10" are listed under this heading. Ensure that all text (i.e., the service layer credits) fits within the border of the figure.
21	Page 19, Table 4-1	Please revise the table as follows: - The table indicates that none of the fish evaluated exhibited abnormalities of the anus. However, Appendix E includes a photo of a white sucker specimen with an inflamed anus. Please clarify this discrepancy. - Footnote "a" states that "the sums of the counts for each type of abnormality do not equal the totals presented in this table." This is only true for internal abnormalities. Please revise the footnote to clarify. In footnote "c," remove the word "has" before "having potential parasites."
22	Page 20, Section 4, last paragraph, last sentence	Please correct the typo in the number of fish stomachs observed to contain food, as 17 is not 59% of 46. It is assumed that n = 27 is the correct number of fish stomachs containing food.
23	Page 21, Table 4-3	Please revise the table as follows: - Please revise the headers for the columns labeled "Total" to clarify that it is the total number of abnormalities observed, not the total number of fish. - Please clarify why only one tessellated darter was evaluated when five of every other species was evaluated. - Please double check the total numbers of internal abnormalities. The counts add up to 15, not 16. Please double check the total numbers of fish with internal abnormalities. The counts add up to 12, not 13.
24	Page 24, Table 5-1	Please revise this table as follows: - Include the total number of samples analyzed by reach in addition to the overall total. Delete the extra "t" after "fillet (skin-on)" for smallmouth bass.
25	Pages 25 through 37, Figures 5-1 through 5-7	Please revise these figures as follows: - Symbols (shapes and colors) representing the different types of tissue samples should be consistent across all figures. - Include a separate figure for each fish species for consistency. - Revise the legend so that the symbols for "River Mile," "River," and "LPRSA" are not listed under the heading "catch location." - Revise the legend so that the symbols for "Reach 9" and "Reach 10" are not listed under the heading "Tissue." Ensure that all text (i.e., the service layer credits) fits within the border of the figure.
26	Page 39, Section 5.2, first bullet	Please revise this bullet to clarify that the fourth and fifth characters identified the 2-mile reach (e.g., "The first five characters were "UPR" to identify the project area (Upper Passaic River) and either "09" or "10" to identify the 2-mile reach."). In addition, please delete the word "segment" as it is redundant.

No.	Section	Comments
27	Page 39, Section 5.2, second bullet	Please revise this bullet to note that white sucker was an exception to the use of the Latin binomial in the sample ID, since the letters "CC" were used for carp. In addition, please correct the reference to Table 3-2, which should refer to Table 5-2.
28	Page 39, Section 5.2, third bullet	Please revise this bullet to clarify what is meant by "sequential number" (e.g., was the sequence used the order in which the samples were collected?).
29	Page 40, Section 5.3, first paragraph, fifth sentence	Please revise this sentence to include the shipping procedures for Alpha Analytical, which is the only one of the five labs not mentioned here.
30	Page 41, Table 5-3	Please remove "blue crab" from the title of the table since blue crab was not part of this sampling program.
31	Page 43, Table 6-1	Please revise the table as follows: - Both total mercury and methyl mercury are discussed in Section 6.1.5, but only "mercury" is listed in Table 6-1. Please clarify or revise the entry in Table 6-1 to read "total mercury and methyl mercury." Please clarify why total PAHs and total PCB aroclors are not presented in the figures, per footnote "d," or discussed in the text despite being selected "for detailed presentation."
32	Page 44, Section 6, first paragraph after Table 6-1, last sentence	Please clarify how American eel, carp, and white perch were selected for the presentation of data in the figures.
33	Page 45, Section 6.1, first bullet	Please revise the bullet to clarify that thallium was only detected in channel catfish.
34	Page 45, Table 6-2	Please revise the table as follows: - Add the definitions for "mg/kg" and "µg/kg" to the footnotes. - American eel fillet tissue samples are listed as "skinless." However, Table 5-1 indicates that American eel fillet tissue samples had skin on. Please resolve the discrepancy in this table and all similar tables in Section 6 (i.e., Tables 6-3 through 6-9). - Table 5-1 indicates that channel catfish carcass tissue samples included skin. Please add this to Table 6-2 and all similar tables in Section 6 (i.e., Tables 6-3 through 6-9). Please revise the table formatting for Table 6-2 and all similar tables in Section 6 (i.e., Tables 6-3 through 6-9) so that all tissue types associated with the same fish species are on the same page. For example, under arsenic, the fillet and whole-body samples for American eel are on page 46 while American eel carcass samples are on page 45.
35	Page 59, Section 6.1.1, first paragraph, last sentence	Table 6-2 shows the same minimum cadmium concentration of 0.0005 J mg/kg ww for four different samples: a brown bullhead fillet sample, a carp fillet sample, a smallmouth bass fillet sample, and a white sucker fillet sample. Only two samples are listed in the text as sharing this minimum concentration, and one of them (the "smallmouth bass carcass composite sample") does not match the results shown in Table 6-2 (for which the minimum carcass result for smallmouth bass is given as 0.0043 J mg/kg ww). Please revise the text and table as needed for accuracy and consistency.
36	Page 60, Figure 6-1	Please clarify whether outliers greater than 3 times the IQR from the nearest of either the 25th or 75th percentile are included in the box and whisker plots.

No.	Section	Comments
37	Page 61, Figure 6-2	Please clarify the note stating that "The RL is displayed for non-detected concentrations." There are no RLs displayed in the figure. If the note is meant to state that nondetects were set equal to the RL when calculating the median, 25th percentile, and 75th percentile concentrations represented in the figure, this should be clarified. This comment also applies to Figure 6-14 on page 90 and Figure 6-39 on page 189.
38	Page 61, Section 6.1.1, first bullet	Please correct the typo and change "eels" to "eel" in the phrase "American eels samples."
39	Page 63, Figure 6-3	Please revise this figure as follows: - American eel fillet tissue samples are labeled as "skinless" in the figure. However, Table 5-1 indicates that American eel fillet tissue samples had skin on. Please resolve the discrepancy in this figure and all similar American eel figures in Section 6 (i.e., Figures 6-7, 6-11, 6-15, 6-20, 6-23, 6-28, 6-32, 6-36, 6-40, 6-44, 6-48, and 6-52). Please add sample ID labels for the non-detects. This revision should be made for all similar figures in Section 6.
40	Page 67, Figure 6-5	Please revise the note stating "All samples were detected" to read "Cadmium was detected in all samples." Similar revisions should be made for all similar figures in Section 6 without non-detects.
41	Page 69, Section 6.1.2, first paragraph, second sentence	Please revise this sentence to state that the highest concentration was measured in a carcass sample, not a whole-body sample.
42	Page 79, Section 6.1.3, first paragraph, fourth sentence	Please correct the typo and change "distribution" to "distributions."
43	Page 101, Section 6.1.5, first paragraph	Please correct the figure references in this paragraph. "Figures 6-20 through 6-23" should be "Figures 6-20 through 6-22," and "Figures 6-24 through 6-26" should be "Figures 6-23 through 6-25."
44	Page 102, Section 6.1.5, first bullet (continued from page 101)	Please revise this bullet to note that samples UPR10-CCFT-Ind030 and UPR09-CCWB-Ind007 are individual samples, not composite samples as stated.
45	Page 115, Figure 6-26	Please clarify whether there were any significant differences in the percentage of total mercury represented by methyl mercury based on the type of tissue analyzed (carcass, fillet, or whole body). This figure could be reproduced using three different color bars for the three types of tissue samples.
46	Page 116, Table 6-3	Please revise the table as follows: - Add the definition for "µg/kg" to the footnotes. Revise the detection frequencies so that they are all rounded to whole numbers for consistency.

No.	Section	Comments
47	Page 117, Table 6-4	Please revise the table as follows: - Add the definition for "µg/kg" to the footnotes. - Revise the detection frequencies so that they are all rounded to whole numbers for consistency. - For the heading "Total LPAHs (ND = RL)," the first footnote referenced should be "h," not "g." Footnote "c," which states that non-detects are not used in the summary statistics, does not apply to the calculated totals using ND = 0.5 RL and ND = RL. Please revise the bullet to clarify.
48	Page 136, Section 6.3.1	Please revise the text to discuss the PAHs in the order in which they appear in Table 6-4 (i.e., HPAHs should be discussed before LPAHs for consistency).
49	Page 136, Section 6.3.1	The discussion of LPAHs only considers the calculations using ND = 0. While this is consistent with the data usability plan, please revise the text to clearly state this since the data are presented three different ways in Table 6-4 (ND = 0, ND = 0.5 RL, and ND = RL). This also applies to the discussion of HPAHs in Section 6.3.2, the discussion of total DDx in Section 6.7.1, and the discussion of total chlordane in Section 6.7.2.
50	Page 155, Table 6-5	Please add the definition for "µg/kg" to the footnotes.
51	Page 165, Table 6-6	Please add the definition for "µg/kg" to the footnotes.
52	Page 165, Table 6-7	Please revise the table as follows: - Please add the definition for "µg/kg" to the footnotes. - Footnote "c," which states that non-detects are not used in the summary statistics, does not apply to the calculated totals using ND = 0.5 RL and ND = RL. Please revise the bullet to clarify. Please delete the second sentence from footnote "e." The same statement is made in footnote "f."
53	Pages 172 through 174, Section 6.5	The concentrations reported in the discussion of PCB congeners are rounded to three significant figures, while the corresponding concentrations in Table 6-7 are rounded to two significant figures. Please revise this section for consistency between Table 6-7 and the discussion in the text.
54	Page 172, Section 6.5, first paragraph, second sentence	Please revise this sentence to clarify that sample UPRX-ELCT-Comp01 is a composite sample.
55	Page 172, Section 6.5, first bullet, second sentence	Please add a reference to footnote 11 at the end of this sentence.
56	Page 181, Table 6-8	Please add the definition for "ng/kg" to the footnotes.
57	Page 189, Figure 6-39	Please delete the extra comma after "whole-body" in the figure title.
58	Page 190, Section 6.6.1, first paragraph, first sentence	Please correct the reference to Figure 6-43, which should be Figure 6-42.

No.	Section	Comments
59	Page 197, Table 6-9	Please revise the table as follows: - Please add the definition for "µg/kg" to the footnotes. Footnote "c," which states that non-detects are not used in the summary statistics, does not apply to the calculated totals using ND = 0.5 RL and ND = RL. Please revise the bullet to clarify.
60	Page 230, Section 6.7.2, first bullet	Please revise this bullet to indicate that sample UPR09-ARWB-Ind019 was collected from Reach 9, not Reach 10 as stated.
61	Page 250, Section 6.8, first paragraph after table, last sentence	Please delete the reference to blue crab from this sentence as blue crab was not part of this sampling effort.
62	Section 7.1, page 255, first paragraph, third sentence	Please replace the reference to "sediment samples" with "tissue samples."
63	Page 259, Section 8	The third reference, Krone et al., is cited on page 41 as the method used for analysis of butyltins by ALS – Columbia Analytical Services. Please verify whether the correct reference should be "A method for analysis of butyltin species and measurement of butyltins in sediment and English sole livers from Puget Sound" rather than the paper referenced in Section 8, titled "Butyltins in sediment from marinas and waterways in Puget Sound, Washington State, USA."