COMMENTS
RI WATER COLUMN MONITORING/HIGH VOLUME
CHEMICAL DATA COLLECTION QUALITY ASSURANCE PROJECT PLAN
WORKSHEETS #9, 10, 11, 17 AND 18
LOWER PASSAIC RIVER RESTORATION PROJECT
DATED APRIL 2012, REVISION 0

No.	General Comments
1	The frequency of sampling described in this QAPP is not sufficient. The first round should be collected and analyzed using rapid turnaround. A decision will be made as to whether additional rounds of sampling should be conducted using the same procedures/approach. Please revise the QAPP to reflect this, as was done for the low volume CWCM program.
2	Neither the QAPP analytical worksheets nor analytical SOPs address the analysis of polyurethane foam sorption (PUF) medium. SOP A-1 has a section discussing the extraction of PUF used in an air sampling train but not water sampling. Information for this "matrix" needs to be captured on Worksheets 12, 15, 19, 20, 21 and 23. Additionally the extraction and analytical procedure for analysis of the PUF sample with a water matrix must be added to SOPs A-1, T-5 and any other SOPs under which this matrix will be analyzed.
3	Please forward the laboratory results from the comparison of using the polyurethane foam (PUF) sorbent media versus the Infiltrex™ XAD-2 resin, and provide the rationale for using the PUF filter.

No.	Worksheet No./ Page No.	Specific Comments
4	Worksheet # 9 After Page 3	Kristen Durocher (AECOM) and Ed Garland (HydroQual) had a phone conversation on August 20, 2012 which should be included as part of Worksheet # 9. In particular, the following information was discussed: a. HDR/HydroQual expressed concern with the detection limits that may be achieved during the small volume program. The CPG suggested that the high volume program will be used to fill data gaps. b. HDR/HydroQual mentioned that one DUO which had not been discussed previously was to develop estimates of loads above Dundee Dam and the 3 major freshwater tributaries. The CARP program found that measurement of dissolved phase constituents in the freshwater loads had less variability than particulate phase. CPG agreed to discuss internally whether high volume sampling in the freshwater boundaries should be conducted more frequently than elsewhere in the river to meet this DUO. c. The parties agreed that a series of meetings would be justified to discuss issues related to the high volume program.
5	Worksheet # 9 Page 4 of 6	January 26, 2012 session notes should include comment from the CPG technical committee that they have concerns about CARP high-volume data, which is relevant if the CPG high-volume program is proposed to supplement the CARP data-derived partition coefficients.

6	Worksheet # 9 Pages 5 to 6	March 22, 2012 session notes should include: 1) The comment from the CPG technical committee that they have concerns about CARP high-volume data (see above). 2) The comment from the USEPA modeling team that the CPG team has extensive data from Hudson (AQEA) and Housatonic (M&N) that should be analyzed to characterize the variability in boundary loading estimates resulting from the number of samples proposed in the CWCM program. 3) A correction to the number of DUO's listed from three to four. The same slide discussed at the January 26, 2012 session was shown again. Those four DUO's are listed in the notes from the January 26, 210 session; they are: a. Site Specific Partition Coefficients b. Lower Detection Limits c. Comparison of model computations to dissolved and particulate phases d. Estimation of boundary conditions
7	Worksheet # 10	a. The focus on the objective of estimating site-specific partition coefficients understates the importance of other objectives listed above as items b, c, and d. The text should be revised to be more balanced. b. The QAPP states that the dissolved-phase for the HV-CWCM program will be operationally defined by the 0.7 um filter size. It should be stated (for clarification) that for consistency with the SV-CWCM program, suspended solids, dissolved organic carbon, and particulate organic carbon will also be operationally defined by the 0.7 um filter size. c. In the first bullet statement, delete the word "apparently." The dissolved-phase is operationally defined by the 0.7 um filter. (Please scan the document and edit as appropriate; for example, "apparently dissolved fraction" also appears in WS11). d. In the third bullet statement, delete the words "USEPA believes." The bulleted sentence should read: "Develop a set of partitioning coefficients that may improve …."

FOIA_07123_0005459_0002

8	Worksheet # 11; page 2 of 5	a. First bullet on page: The dissolved-phase concentration and solid-phase concentrations will likely be utilized in a number of project evaluations. Please revise text accordingly. b. Third bullet on page: Specific gravity should be included in the parameter list to be consistent with other sections of the CPG QAPP. c. Fourth bullet on page: The starting and ending time should also be recorded. d. Fifth bullet on page: The text states that the overall quality of the data will be examined upon completion of the HV sampling event. This does not address the need to document in the QAPP the required "goodness" of the data to support the data use objectives (DUOs). State specifically what level of data quality is required or refer to the chemical water column QAPP section that provides this information. e. Last bullet on page: One round of sampling is not sufficient. As discussed in the general comments, the work can stop after the first round is collected and analyzed (using rapid turnaround) to determine whether additional rounds should be collected (i.e., if the data is useful), but one round will not fulfill the DUOs for the program. We can discuss how many rounds should be collected.
9	Worksheet # 11; page 4 of 5	Under "Temporal Considerations," the text states that sampling will be conducted independent of tides. Samples at the tidal boundaries should be collected on the incoming tide (as possible).
10	Worksheet # 11; page 5 of 5	The data deliverable should be organized such that surrogate recoveries (which are provided in the final MEDD) are easily connected to the field sample, so that the data user can evaluate the extent of surrogate recovery corrections that were applied on the dissolved-phase concentration.
11	Worksheet #17; page 2 of 2	In the second paragraph, specific conductivity was omitted from the list of parameters to be monitored. Specific conductivity was included on Worksheet #11 page 2 of 5 in the first paragraph. Please revise text.
12	SOPs	Add a sampling SOP that includes, but is not limited to: a. Pump rate limitations – field observations that need to be performed to confirm optimal pumping rate b. Back pressure limit – the field observations above 5 pounds per square inch seemed to indicate that there would be some amount of water perched on the filter. c. Process for folding and transferring the filter into the collection jar. d. Process for emptying/rinsing vortex. e. Dynamic spike volume, timing, and compounds. f. Method for taking field duplicate samples. g. Sample collection procedure for total water from simultaneous sampling vessel.

FOIA_07123_0005459_0003

13	SOPs	Add an extraction SOP that includes, but is not limited to: a. Process for transferring filters from sample jar to extraction thimble b. Number of filters that can be efficiently extracted in one vessel
14	SOPs	Add an analysis SOP that includes, but is not limited to: a. Data quality criteria for analysis of filter media b. Data qualify criteria for analysis of PUF media c. Data quality criteria and evaluation procedure for PUF dynamic spike d. Data quality criteria and evaluation procedure for PUF breakthrough

No.	Comments Based on May 10, 2012 Gravity Equipment Demonstration
15	During the demonstration, while changing out the filter it was noted that the water perched on the filter would flow off the filter onto the plate. This water carried loose solid material off the filter leading to a loss in sample mass. The technique used to remove the flat-filter pad and collected solids should be modified to reduce the likelihood of spilling solids. For example, after folding the filter pad in half twice, perhaps the filter pad should be lifted from the outside edge of the pad, rather than from the center. The SOP should be modified to address this issue.
16	Based on the results of the field test, what is the CPGs expectation of the volume of water needed to obtain the required analytical mass?
17	Several members of the EPA team expressed concern about the representativeness of the samples collected from the 20 liter carboy for suspended sediment and particulate organic carbon analyses. This concern could be evaluated quantitatively by collecting multiple samples that contain the entire 20 liter volume and evaluating the variability of the results.
18	Information about pumping rates, pumping durations, mass of solids collected and ambient solids concentrations are inconsistent. Gravity and the CPG mentioned that the prior day's sampling resulted in the collection of approximately 6 grams of sediment after filtering 50 liters of water. This corresponds to a solids concentration of 120 mg/l, which would be a high concentration for the conditions that week. On the day of the demonstration, Gravity was estimating collection of several grams (2-4) of sediment, but reporting concentrations from the LISST of near 10 mg/l. At a pumping rate of 0.5 L/min and 10 mg/l, it would take 6.7 hours to collect 2 grams of dry sediment. This is an important issue to resolve because if the lab needs 2 to 4 grams of dry solids, the pumping time would be much longer than the CPG team was mentioning during the demonstration. Figure 1 shows the pumping time required to collect 2, 4, and 6 grams of dry sediment as a function of the ambient suspended sediment concentration. Given concerns expressed by the CPG about difficulty staying on station with the amount of ship traffic, consideration should be given to collecting large volumes of water quickly and transporting the samples to a fixed location for processing. Figure 2 shows the volume required to be pumped to obtain 2, 4, and 6 grams of dry sediment as a function of the suspended sediment concentration. This pumping volume would be required regardless of whether the sample is processed in the field or at a land-based location.

FOIA_07123_0005459_0004

19	Please provide further information on the rationale for target sample solids mass, how the data from the demonstration will be evaluated to estimate achievable analytical sensitivity, and how an adequate sample mass will be confirmed in the field (considering that TSS and solids contaminant concentrations may vary throughout the tidal cycle and across sampling locations). When estimated detection limits are provided in the CPG QAPP Worksheet 15, the associated sample mass should be identified.
20	The QAPP should confirm the frequency/quantity of field blanks and equipment blanks that will be collected and analyzed during the HV-CWCM program. Based on the discussion during the field demonstration, we understand that there will be one field blank per batch of pre-cleaned laboratory equipment and there will be one equipment blank collected after each sampling location.
21	The CPG should provide text in the QAPP discussing the independence of partitioning coefficients from tidal conditions, even though water column solids concentrations are expected to vary. Alternately, the CPG should consider collecting large volume water column samples rapidly/synoptically in the field and transporting them back to a field facility for subsequent processing.
22	The CPG field team proposes to collect one field sample per location, which will yield one partitioning coefficient per location. To bound these coefficients with some reasonable degree of uncertainty, it is recommended that at least two field duplicates (or co-locates) be collected during the sampling event.
23	Based on observation of the field demonstration, it appeared that most of the solids were by-passing the vortex separator and were being captured on the flat filter. Consequently, the flat filters were the dominant collection system for the solids phase. The CPG should consider the use of a cartridge filter ahead of the flat filter to reduce the need for frequent flat filter blinding and change-out. As has already been noted, difficulties with the handling of the flat filter were observed in the field (turbid standing water on top of the filter during change-out) and procedures should be developed to avoid allowing solids to be lost/spilled from the sample or to be inadvertently captured in the dissolved-phase portion of the apparatus. It is recommended that the flat filters be handled separately from the water and solids captured by the vortex. Furthermore, the QAPP should provide more information on how Analytical Perspectives (the CPG laboratory) plans to process and analyze the water and solids collected via the vortex.
24	Based on discussions during the field demonstration, the CPG have elected to conduct co-located sample collection versus field duplicate sampling, and laboratory replicates are not currently planned. Please clarify in the QAPP how precision and accuracy will be assessed during the HV-CWCM program.
25	The final QAPP should provide clear measurement performance criteria for the dissolved-phase surrogate recoveries, especially since it is anticipated that the dissolved-phase concentrations will be corrected for the surrogates lost during the field filtration process. Also, as discussed during the field demonstration, the final QAPP should include a list of labeled surrogates that will be used to assess the efficiency of the polyurethane foam (PUF) cartridge.
26	Several large particles were visually observed in the 20 liter carboy container. It is recommended that suspended solids, dissolved organic carbon, and particulate carbon samples be collected from the carboy and analyzed in *replicate* to assess the uncertainty for these values. Replicate values are critical to assess the ability of the CPG field team to sub-sample the surface water collected in the carboy and because these parameters will ultimately be used in unit conversion calculations.

FOIA_07123_0005459_0005

27	During the field demonstration, it was observed that the sampling intake tube inside the 20 liter carboy was curved and its end was nearly adhering to the side of the carboy during the collection of the water samples for TSS and organic carbon. It is recommended that the intake tube design be modified for future sampling so that the tube maintains a straight drop and is collecting water from the center of the carboy. A larger magnetic stir bar is recommended during sampling based on the carboy volume.

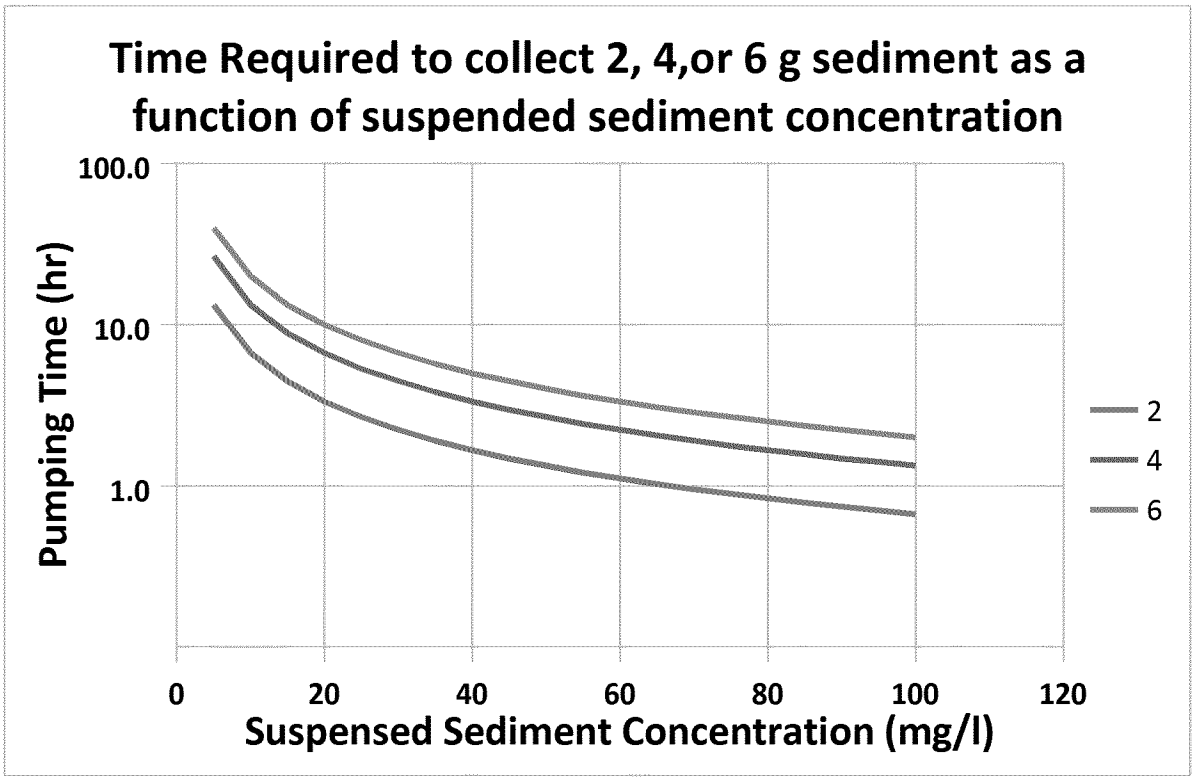

Figure 1. Pumping Time as a Function of Suspended Sediment Concentration

FOIA_07123_0005459_0006

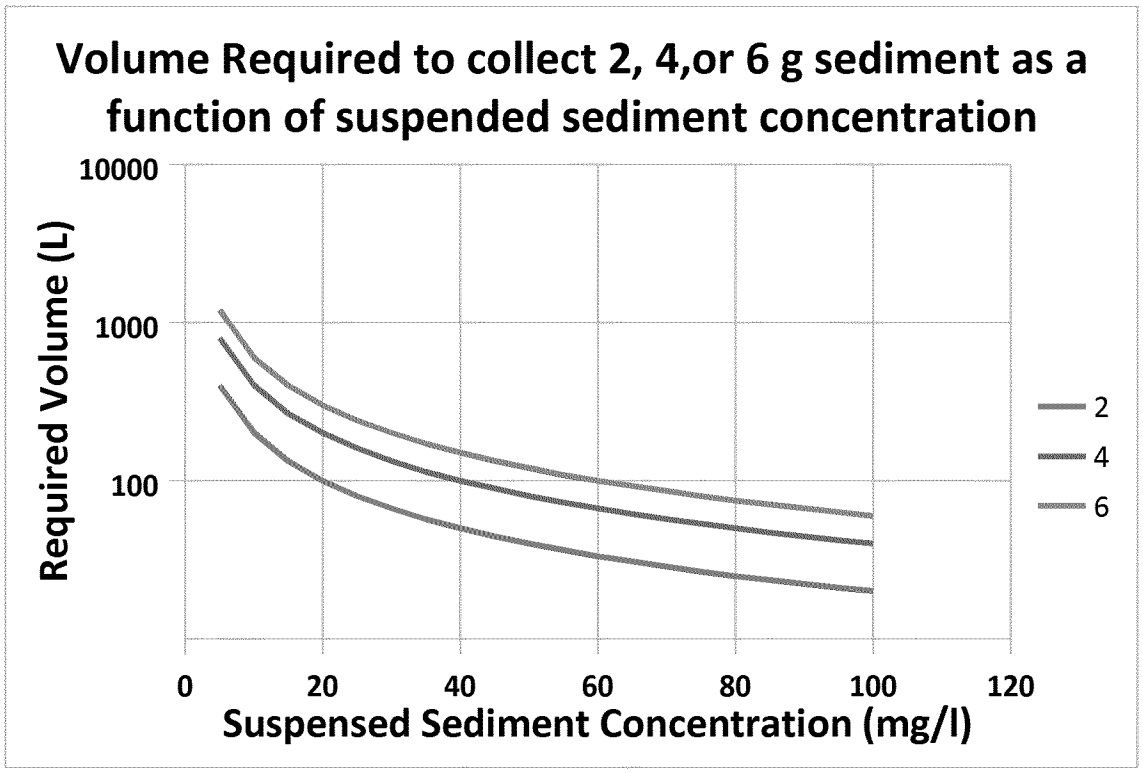

Figure 2. Pumping Volume as a Function of Suspended Sediment Concentration

FOIA_07123_0005459_0007