No.	Section/ Worksheet No.	Comment	Response
1	Introduction, page 1 of 7, "Group A parameters" subparagraph	(a) The Group A parameters subparagraph at the bottom of the page states "The resulting data will be used to estimate sorption partition coefficients under a range of conditions." The text should be revised to state that the "range of conditions" refers only to different salinity regimes. (b) Recommend moving the discussion of salinity regimes to the main text (above the Group A/B subparagraphs) since it applies to both the Group A and Group B parameters.	(a) The QAPP will be revised to indicate that the range of conditions refers to salinity. (b) The QAPP will be revised accordingly.
2	Introduction, page 1 of 7, "Group B parameters" subparagraph	In the last line of the subparagraph, please revise wording to "collected continuously during the entire duration of the HV sampling."	The QAPP will be revised accordingly.
3	Introduction, page 2 of 7	In addition to salinity, temperature, specific conductivity, dissolved oxygen and pH, which the QAPP states will be recorded in the field, the following additional information is important for interpretation of results and should also be recorded at the time of sample collection: time of day and associated tidal cycle at sample collection, total water column depth, location of sample relative to navigational channel, and current and recent (last 48 hours) weather conditions, such as general wind direction and speed, and storms and/or other water-impact events (algal blooms, etc.).	SOP LPR-G-01 (Field Records) provides a list of additional data that are recorded during the field program. To comply with the comment, the items listed in the comments will be specifically included in the HV QAPP, Worksheet #11.
4	Introduction, page 2, paragraph 2	Add the language in quotes to the 2nd paragraph on this page: HV water samples will ", initially," be collected during one planned sampling event when flows at Dundee Dam are between 400 and 3,000 cubic feet per second (cfs), "and the results will be evaluated to determine if additional rounds are warranted."	The QAPP will be revised accordingly.
5	Introduction, page 2 of 7, first line of 3rd paragraph	Delete extraneous character "c."	The QAPP will be revised accordingly.

6	Introduction, page 2 of 7, 2nd bullet	Add that the RM 4.2 location may be moved if flows at Dundee Dam are <1000 cfs. Also, consider re-ordering these bullets to present the locations from north to south.	The RM 4.2 location will be made consistent with Tidal 2 from the SV CWCM program. As such, language will be added to state that the location will move when flows are <1,000 cfs at Dundee Dam. The QAPP will be revised to re-order the locations from north to south.
7	Introduction, page 4 of 7, last paragraph:	Revise sentence to include missing word: "The Passaic and Hackensack Rivers flow into NB from the north. The National Oceanic and Atmospheric Administration…"	The QAPP will be revised accordingly.
8	Introduction, page 6 of 7, Top two paragraphs	(a) Recommend that when using the words "better quality" or "improved" data that these terms are qualified (*e.g.,* lower detection limits). (b) Briefly describe the partition coefficients currently being used and why these partition coefficients are inadequate and additional data are required.	(a) The QAPP will be revised accordingly. (b) USEPA and its modeling team have concluded that the existing site-specific partitioning coefficients are inadequate and additional data are required. The CPG does not understand USEPA's reasoning for this conclusion and is not in a position to provide the requested description.
9	Worksheet 5	Please correct company name to "The Louis Berger Group, Inc." in the USEPA Oversight Contractor box.	The QAPP will be revised accordingly.
10	Worksheet 6, page 1 of 4	Consider adding coordination of oversight activities to the "Procedure" column.	The QAPP will be revised accordingly.
11	Worksheet 9, page 2 of 8	Please correct the following items: (a) AmyMarie Accardi-Dey's affiliation abbreviation should be "LBG", not "LBI". (b) AmyMarie Accardi-Dey's email address should be aaccardidey@louisberger.com. (c) Ed Garvey's affiliation should be "LBG", not "LBI".	(a) The QAPP will be revised accordingly. (b) The QAPP will be revised accordingly. (c) The QAPP will be revised accordingly.
12	Worksheet 9, page 3 of 8	In items 2 through 4, please revise "(LBI)" to ("LBG").	The QAPP will be revised accordingly.

13	Worksheet 10	(a) When discussing the calculation of partitioning coefficients, the QAPP should state that the coefficients to be developed will be site-specific and that the operationally-defined dissolved-phase concentration is expected to include contaminants bound to colloids, to the extent that this fraction is captured by the sorption medium (PUF). Note that the AECOM memo dated May 4, 2012 on the AP and Gravity Environmental studies performed with the PR-2900 and colloidal spikes showed that the PUF media and filters did not show good recovery for colloidal particulates of 0.1 um. If colloids (and their associated contaminant load) are not being captured by the PUF, then how will the partitioning coefficients be impacted (*i.e.*, contaminant mass passing through and not being accounted for in either the particulate-phase or dissolved-phase)? (b) Summarize how partition coefficients will be developed for each separate analyte (if so) and how the partition coefficients will be used to support the CFT model. (c) Describe how the SSC, DOC and POC data will be used in the partition coefficient calculations and how this will support improvements to the CFT model.	(a), (b) and (c) Development and calculation of partition coefficients is beyond the scope of this QAPP. The CPG Modeling Team will develop a Technical Memorandum for USEPA review that describes the partition coefficient development. The methods for development will be finalized upon initial review of the HV data. The QAPP will be revised to cite preparation of the Technical Memorandum.
14	Worksheet 10, page 1	The "dissolved phase" is operationally defined for this sampling - this definition is somewhat different from that used in the CARP work (and potentially other studies whose data have been used to develop partition coefficients). Thus, differences in the definitions of the "dissolved" and "solid" phases should be considered when comparing and using partition coefficients calculated using the data from different studies.	Comment acknowledged.
15	Worksheet 10, bullets at bottom of page 1	The bullets at the bottom of page 1 of Worksheet 10 should be revised to be consistent with the three goals of the HV CWCM program listed in the Introduction (page 6 of 7).	The QAPP will be revised accordingly.
16	Worksheet 11, General Comment	Throughout the QAPP, the vortex is described as a “centrifuge-like vortex” yet, in the associated SOP prepared by the developers of the PR-2900, no such description is provided. Since a centrifuge is a powered system and the vortex is not, the phrase “centrifuge-like” in the QAPP should be deleted throughout.	The QAPP will be revised accordingly.
17	Worksheet 11, page 1 of 5, Who	In addition to the entities listed, please add the term “Partner Agencies” to this section, and then elsewhere in the document identify the included	The QAPP will be revised accordingly.

	will use the data?		
18	Worksheet 11, page 1 of 5, What will the data be used for?	(a) As part of this section, bullets 4 and 5 are limited to use of dissolved phase COPC for the human health and ecological risk assessments. However, both the dissolved and particulate phases of COPC concentrations in surface water may be useful for these assessments, unless technical justification otherwise is provided. Please include both for now, or include the justification not to. (b) Please revise "may be used" to "will be used" with regard to use of the data for risk assessment and bioaccumulation evaluations.	(a) The QAPP will be revised accordingly. (b) The QAPP will be revised accordingly.
19	Worksheet 11, page 1 of 5, What types of data are needed, 1st paragraph	State how the data will be reported. For example, will the solid-phase concentration be reported in contaminant mass per sampler, or per volume of water filtered, or per solids mass? Similarly, for the dissolved-phase concentration, will it be reported in contaminant mass per PUF or per volume of water filtered?	Laboratory results will be reported in contaminant mass per sampler, either filtered solids or PUF. Final report results will be in concentration units calculated based on estimated solids mass from the TSS and volume filtered for the particulates; and total volume for the PUF.
20	Worksheet 11, page 2 of 5, What types of data are needed, 3rd bullet	The CPG stated during the "field demonstration lessons learned" conference call on 14 June 2012 that the LISST instrument data may not have correlated well with in-situ suspended solids concentrations, and that the SV-CWCM suspended solids data would be used to estimate volumes to be filtered during HV sampling. Revise LISST bullet to state only the current objectives of LISST measurements (*i.e.*, to guide filter changes).	The QAPP will be revised accordingly.
21	Worksheet 11, page 2 of 5, How much data are needed, 3rd bullet	Please modify the third bullet as follows: "One round of sampling ~~is anticipated~~ *will initially be conducted* to fulfill the objectives of the HV sampling program. *The data will be submitted for rapid turnaround analysis (i.e., 30-day). The CPG will review and discuss the initial round of HV data with EPA, and additional sampling rounds will be conducted, if warranted*."	The QAPP will be revised accordingly.
22	Worksheet 11, page 2 of 5, What types of data are needed,	(a) Please modify the 4th bullet ["The total volume of water collected from each location will be recorded, as well as pump rate and sampling duration (start time and stop time)"] to include a statement that HV sampling will target the incoming tide as practical, per the CPG response to comment No. 9 (dated 3 July 2012, page 5 of 15). (b) State that flow rate will be monitored and recorded every 15	(a) The QAPP will be revised accordingly. However, it is important to note that the flood tide duration may not be long enough to accommodate the full duration of the HV sampling. The sampling will be conducted in such a way as to minimize ebb tide sampling.

	4th bullet		
23	Worksheet 11, page 2 of 5, How much data are needed, 4th bullet	Please modify the fourth bullet to state that the "four time-weighted composite samples of whole water for analyses of POC, DOC and SSC" will be collected together at the end of the HV sampling and final results averaged. Or, alternately, add a cross-reference to "Sampling Methodology" on page 4 of 5 of Worksheet 11.	The QAPP will be revised accordingly.
24	Worksheet 11, page 3 of 5, Where, when and how…, 1st bullet	The QAPP states (Introduction, page 2 of 7) that HV sampling will occur between flow conditions of 400 cfs and 3,000 cfs; therefore, please remove the phrase "(when flows at Dundee Dam are < 250 cfs, this location will be moved upstream to RM 13.5)" regarding the RM 10.2 sampling location on Worksheet 11 ("Where, when and how…", page 3 of 5).	The QAPP will be revised accordingly.
25	Worksheet 11, page 4 of 5, Sampling Methodology	Correct typo - "PBCs" should be "PCBs.	The QAPP will be revised accordingly.
26	Worksheet 11, page 4 of 5, Sampling Methodology	When the PUF media is first mentioned in Worksheet 11, please provide basic background on how the sorption medium works.	The QAPP will be revised accordingly
27	Worksheet 11, page 5 of 5, How will the data be reported?	In addition to the 3 items listed (which address how the data were collected, deviations from work plan, and quality assurance of data/meeting project objectives), the data summary memorandum should include a summary of the HV surface water sample results, including sample summary tables providing dissolved and particulate contaminant concentrations for primary COPC, associated physical parameter results for each sample location, and sampling conditions. A map showing final sample locations should also be included.	The QAPP will be revised accordingly.
28	Worksheet 12, PCB and PCDD/F Analytical Groups, General Comment on	In the Worksheet 12 header, the matrix is shown as "Solids (Sorption Media [PUF]);" However, the PUF is defined in the QAPP as capturing the dissolved phase of water column contaminants. Add clarifying footnote that the PUF is considered a solids sample from the laboratory's perspective or change matrix to dissolved phase.	The PUF is considered a solids sample from the laboratory's perspective. The QAPP will be revised accordingly.

	PUF Matrix		
29	Worksheet 12, PCB and PCDD/F Analytical Groups, General Comment on PUF Matrix	There is no mention here of a second PUF cartridge and monitoring of potential breakthrough of contaminants on the PUF media. Per AECOM's conference call with USEPA on June 14, 2012, the dynamic and static spikes will be used to evaluate potential breakthrough. Specific details indicating exactly how loss of dynamic and/or static spikes will be attributed to breakthrough in the sampling device versus losses of the spike compounds during laboratory extraction, clean-up and analysis must be provided in the field and analytical SOPs. Language should also be added to Worksheet 12 indicating that analyte breakthrough will be monitored, the mechanism by which the monitoring will take place, and measurement performance criteria for any breakthrough detected/indicated.	The static spike recoveries will be used to monitor analyte breakthrough on the PUF sorbent. The QAPP will be revised accordingly. A second PUF cartridge will be used to monitor the potential for saturation of the PUF, or breakthrough.
30	Worksheet 12, PCB and PCDD/F Analytical Groups, General Comment on PUF Matrix	What is the loading capacity of the PUF? Recommend including a quality control sample to demonstrate that material has sufficient capacity to mitigate breakthrough.	The exact PUF loading capacity is unknown but it is expected to exceed the maximum HOC concentration in the water column. Previous confidential work conducted by Gravity using PUF has captured PCBs at concentrations of approximately 100 ppm.
31	Worksheet 12, PCB and PCDD/F Analytical Groups, General Comment on PE	(a) PE samples are currently proposed for only the solid-phase. How will the solid-phase PE be analyzed? Will all of the method modifications be applied to the PE sample as is the case with the solid samples collected from the HV sampler? Clarify on Worksheets 31 and 32 that PE samples are currently only proposed for the solid-phase. (b) What are the supplier-certified limits for the solid-phase PE sample? (c) Please see comment 58. Recommend that PE be analyzed incorporating all modifications stated in the HV QAPP. (d) For the dissolved-phase, no PE samples have been currently proposed, only "QC Standards". Will all of the method modifications be applied to the QC Standards as is the case with the dissolved samples collected from the PUF sampler (*i.e.,* will the standards be spiked onto the PUF, extracted, and analyzed)?	a) Method modifications do not apply to the particulate fraction. The PE extraction procedure will be the same as applied to soil/sediment samples. b) The supplier-certified limits are PE lot dependent and cannot be predicted before the PEs are ordered. Any PE studies conducted in support of the HV QAPP will be provided to USEPA. c) See response to comment 58 below. d) The batch control spike (QC standards) is not processed as a sample because doing so would negate its purpose. The method blank provides an indicator of method performance on a quality control matrix (precleaned PUF), as the ^{13}C-labeled standards

			behave chemically identically to the target analytes.
32	Worksheet 12, PCB and PCDD/F Analytical Groups, General Comment on Field Duplicates	Criteria for acceptance for field duplicate pairs with concentrations less than 5 times the QL should be established.	The QAPP will be revised to include a criteria for concentrations less than 5 times the QL.
33	Worksheet 12, PCB and PCDD/F Analytical Groups, General Comment on Precision	It is understandable that samples cannot be split in the laboratory; however, some indication of laboratory precision should be included. Recommend including a laboratory control sample duplicate (LCSD) with each batch.	The AP laboratory uses batch control spike samples in lieu of the conventional LCS. An LCS/LCSD pair would indicate only the precision of *spiking* the LCS/LCSD – they would fail to indicate the precision of the method. Precision in isotope dilution methods is dictated by 1) reproducible spiking of extraction standards, 2) reproducibility of subsampling (not relevant to PUFs), 3) instrument response variation, and 4) random error. The batch control spike corrects for instrument response variation and can identify irreproducible spiking of extraction standards. Since subsampling reproducibility is not an issue for PUFs, as the whole sample is extracted, imprecision will result only from random error. The batch control spike also gives an assessment of this random error, as it is injected at the beginning and end of the analytical sequence. No changes to the QAPP are necessary.
34	Worksheet 12, PCB and PCDD/F Analytical Groups, General	Based on the CPG PUF Comparison Memo (dated 4 May 2012; page 2), provide measurement performance criteria for extraction standards and alternate cleanup standards. These criteria should be consistent with the recovery stated in the CPG PUF Comparison Memo, that is (1) an average recovery of 80% for PCDD/F and 84% for PCB for the extraction standard, and (2) an average recovery of 73% for the PCDD/PCDF and 98% for the PCBs for the alternate cleanup standard. (Note that PCDD/F extraction recoveries should be consistent with	Measurement performance criteria for the extraction standard recoveries consistent with or stricter than the USEPA reference methods are stated in the QAPP. Using the laboratory data from an experimental demonstration of the HV technique in interference-free media is inappropriate to establish criteria for river

	Comment	corrective action implemented to minimize loss of PCDD/F during cleanup, refer to CPG PUF vs. XAD Comparison Memo, page 3, first paragraph.)	water sample performance. Appropriate alternate cleanup standard criteria will be added to the QAPP.
35	Worksheet 12, PCB Analytical Group (both Solids and PUF), pages 1-4 of 11	The measurement performance criteria for the PCB method blank should be consistent with those for the PCDD/F method blank on pages 5-8 of 11.	A comparable level of detail will be added to the PCB method blank criteria. See Response to Comment #41.
36	Worksheet 12, PCB Analytical Group (both Solids and PUF), pages 1-4 of 11	Similar to the PCDD/F tables, add a QC Standard to the PCB measurement performance criteria. For both PCDD/F and PCB, provide a footnote clarifying what the QC Standard will be.	The QAPP will be revised accordingly.
37	Worksheet 12, PCB Analytical Group (both Solids and PUF), pages 1-4 of 11	Because of the limited quality assurance indicators available for the HV analysis, the measurement performance criterion of 50 percent difference relative to the ICAL for the batch control spike is too large. Recommend that measurement performance criteria be reduced to less than or equal to 40 percent difference.	Changing these criteria will not improve data quality because the laboratory quantifies its data using the response factors obtained at the time of analysis. Doing so eliminates systematic errors that are introduced by using ICAL response factors obtained (in many cases) months before the analysis under conditions that no longer apply. The purpose of comparing batch control spike response factors to the ICAL is to detect systematic errors in either spiking of the samples or in the instrument behavior. However, particularly in the case of PCBs, active sites in the GC/MS system can cause very large deviations from ICAL parameters that are of no import if response factors obtained at the time of analysis are used. No changes to the QAPP are necessary.

38	Worksheet 12, PCB Analytical Group (both Solids and PUF), pages 1-4 of 11	EML is not provided in Worksheet 15; therefore, in Worksheet 12 replace EML with either EDL or QL (or correct Worksheet 15 accordingly).	The QAPP will be revised accordingly.
39	Worksheet 12, PCB Analytical Group (PUF), page 4 of 11	The measurement performance criteria for the PCB static spike (50-150%) and dynamic spike (25-150%) are too large and may result in a large degree of correction of the dissolved-phase concentration to account for potential PUF inefficiencies and breakthrough. Based on the CPG PUF Comparison Memo (dated 4 May 2012, page 2), the PCB Static Spike and PCB Dynamic Spike had an average of 90% recovery. Consequently, please revise the measurement performance criteria to 75-125% recovery for both the static and dynamic spikes.	The results for static and dynamic spikes will not be used to correct recoveries of native analytes. These spikes provide information similar to surrogates in empirical methods. Recovery correction by isotope dilution is performed using the extraction standards only. The purpose of the static spike is to assess the extent of desorption from the PUF after adsorption. Desorption is not expected to be a significant problem in river water. The static spike recovery criteria will be changed to 75-125% per request. The purpose of the dynamic spike is to assess capture efficiency, which can potentially be affected by sorption to colloidal particulates and macromolecular natural organic latter in river water. Dynamic spike recoveries achieved in river water have not exceeded 75% so the proposed range based on interference-free water is inappropriate. No changes to the dynamic spike recovery criteria in the QAPP are proposed.
40	Worksheet 12, PCDD/F Analytical Group (PUF), page 8 of	The measurement performance criterion for the PCDD/F dynamic spike is inconsistent. If the criterion is ±30% recovery, then the range should be 70-130%. Moreover, based on the CPG PUF Comparison Memo (dated 4 May 2012, page 2), the PCDD/F Static Spike and PCDD/F Dynamic Spike had an average of 90% recovery. Please modify both	The purpose of the static spike is to assess the extent of desorption from the PUF after adsorption. Desorption is not expected to be a significant problem in river water. The static spike recovery criteria will be changed to 75-125% per request. The purpose of the dynamic spike is to assess capture efficiency, which can potentially be affected by sorption

	11		to colloidal particulates and macromolecular natural organic latter in river water. Dynamic spike recoveries achieved in river water have not exceeded 75% so the proposed range based on interference-free water is inappropriate. No changes to the dynamic spike recovery criteria in the QAPP are proposed.
41	Worksheet 12, PCDD/F Analytical Group (PUF), page 5 and 7 of 11	For method blank, the measurement performance criteria listed do not relate to accuracy/bias contamination in all cases. Suggest revising the DQI phrase to encompass the measurement performance criteria.	The QAPP will be revised accordingly.
42	Worksheet 12, PCDD/F Analytical Group (PUF), page 6 and 8 of 11	For the "labeled compounds" measurement performance criteria, how are labeled compound EDLs used to assess sensitivity? Please explain by clarification of the language in the related boxes. After an explanation is provided, please provide details in the text as to why 2378-TCDD is an exception and what alternate criteria will be used for 2378-TCDD.	As described in the formula for calculating the EDL per USEPA Method 8290, the EDL is a function of peak to peak noise and the peak height of the labeled extraction standard. The height of the peak noise will be affected by instrument conditions such as detector multiplier voltage, chemical interferences, PFK bleed levels, mass resolving power, and other instrument related conditions. The height of the extraction standard peak depends on instrument sensitivity, the true amount of sample injected, the nature and concentration of interferences present, and instrument tuning factors such as slit widths. Therefore the EDL measures both absolute instrument sensitivity and the combined effects of many critical performance parameters not addressed by MDLs or labeled standard recoveries alone. Clarifying language will be added to the QAPP. The exception for 2,3,7,8-TCDD will be removed.

43	Worksheet 12, POC Analytical Group, page 9 of 11	(a) Please clarify the text to indicate the difference(s) between the LFB and LCS quality control samples. (b) Please provide measurement performance criteria for field duplicate pairs with concentrations less than 10 times the QL. (c) Measurement performance criteria for POC are provided in units of mg/L; however, POC reference limits on Worksheet 15 are listed in units of mg/kg. Please correct unit discrepancy. (d) The measurement performance criteria for the LCS reads "95-105 percent recovery (%R) or within the manufacturer's control limits if > 95-105%R." It is not clear what ">95-105%R" means. Is it greater than 95% or greater than 105%? Please clarify.	a) A footnote clarifying the difference will be added. b) The QAPP will be revised accordingly. c) The correct units are mg/L. The QAPP will be revised accordingly. d) The SOP states "All LCSs must have recoveries of 95% to 105% or within the manufacturer's control limits if they are greater than the 95% to 105% range." The QAPP language will be revised to clarify.
44	Worksheet 12, DOC Analytical Group, page 10 of 11	The measurement performance criterion for the DOC LCS is inconsistent. If the criterion is ±10% recovery, then the range should be 90-110%. Please revise or explain the choice of 90-109% recovery.	The SOP defined range is 90-109%. The performance criteria will be revised for consistency.
45	Worksheet 14, page 1 of 2, "Sampling Tasks", 2nd paragraph and Worksheet 11, page 4 of 5, "Sampling Methodology"	a) Per CPG Response-to-Comment No. 15, the addition of the 25 um pre-filter should be added to the description of the filtering system. In addition, when discussing the components of the solid phase sample, the text should clearly state that the solid phase sample will include the vortex solids, the solids retained on the 25 um pre-filter, and the solids retained on the 0.7 um flat filters. b) Note that SOP 19 (PR-2900) states that the 25 um pre-filter is considered optional. If this pre-filter is optional, what is the decision process for inserting the optional filter into the flow stream? How will the observation of neutrally-buoyant solids in the carboy be confirmed and acted upon? c) Is there a possibility for the 25 um flat filter to be clogged and need replacement during the sampling event? If multiple 25 um filters are needed, will it add to the potential for cumulative background contaminant concentrations? How will this be mitigated?	a) The 25 um cellulose pre-filter is comprised of cellulose, not glass fiber. While it was used by Gravity in the past for HV sampling, it has not been used in a program that included analysis of PCDD/Fs. Due to concerns with use of cellulose in the PCDD/F analyses, the algae pre-filter will be comprised of glass wool in a stainless steel chamber similar to that used to contain the PUF medium. The glass wool will pre-filter large algae-type particles that may be present during summer months, and will be placed in line before the vortex separator. The QAPP and associated SOPs will be revised to incorporate a glass wool pre-filter instead of the 25 um cellulose pre-filter, and will indicate that the solids sample includes all separated solids, including the solids retained on the glass wool and 0.7 um filter, and solids removed using the vortex separator. b) Use of the glass wool pre-filter will be determined in

			the field, using readings from the LISST. If the LISST indicates large (i.e., > ~5 um) particles are present in the water column, the pre-filter will be used. Details will be provided in the revised SOP SW-19. c) The 25 um filter may clog and require replacement. Using the glass wool in pre-filled stainless steel cartridges will minimize exposure and potential background contamination.
46	Worksheet 14, page 1 of 2, "Sampling Tasks", 4th paragraph; also Worksheet 20	When describing the POC, DOC, and suspended solids samples, add text to describe that the four sub-samples from the carboy will be analyzed separately and reported as an average (refer to comment on Worksheet 11). This information should also be added to Worksheet 20, Footnote E. In the EDD (either in the comments field or uncertainty field), the error (1 sigma) associated with the average should be included.	The EDD will include the four results from the laboratory, with a note to indicate they are individual results (e.g., results may be listed as "Not Reportable") to avoid confusion. The calculations will be done, the average and error will also be reported in the EDD. The QAPP will be revised accordingly.
47	Worksheet 15, General Comment	Insert a footnote to discuss whether the determination of the achievable laboratory QL considered the potential blank contamination associated with the 0.7 um flat filters and the 25 um pre-filters. Note that as the number of filters used increases for each sample, the level of blank contamination will increase accordingly.	The laboratory does not experience significant blank contamination from precleaned filters on a routine basis. Achievable QLs listed do incorporate typical low level background PCB introduced during cleanup. No changes to the QAPP Worksheet #15 are necessary to address this comment. The QAPP will be revised to indicate 25 um filters will not be used.
48	Worksheet 15, General Comment	Worksheet 15 appears to have been developed for the particulate fraction only (note that Analytical Method Columns (pg/g) and end of table footnotes all relate to solids mass and TSS/SSC). An additional Worksheet 15 needs to be provided for the dissolved phase analyses conducted on PUFs.	A footnote will be added explaining the data is relevant to both the particulate and PUF fractions.
49	Worksheet 15, General Comment	Please add a footnote describing how the PALs and QLs for this QAPP were derived.	The QAPP will be revised accordingly.

50	Worksheet 15, General Comment on EDL for PCB and PCDD/F	Please clarify how the EDL values were derived. Indicate if all method modification and substrate material are represented and whether the EDL is an average of several trials or numbers derived from a single trial. Also indicate if laboratory background contaminants have been accounted for relative to the EDL values listed. Text should indicate that common PCB contaminants are not expected to be present at or above the EDLs listed for a given congener to substantiate the laboratory sensitivity goals provided in this Worksheet.	The EDL values in Worksheet 15 are averages of large sample datasets for solid matrices, corrected to a nominal mass of 1. Actual EDLs are sample specific, so the values presented are only a rough indicator of expected sensitivity. Common laboratory contaminant congeners are not expected to exceed the QLs and should rarely exceed the EDLs. Clarifying language will be added to the QAPP.
51	Worksheet 15, PCB Congeners, pages 1-9 of 15	(a) Achievable QLs for PCB congeners appear to be inconsistent. Typically, the achievable QL will increase if two or more PCB congeners are co-eluting; however, for some co-eluting congeners, there is no increase in the achievable QL of 10 pg/sample (*e.g.*, PCB 44 + PCB 47 + PCB 65). Please clarify. (b) The comparative values included in Worksheet 15 based on definitions provided (Footnote B) for Analytical Method QL and Achievable Lab QL do not seem to match. It is stated that the Analytical Method QL is based upon the published method QL adjusted for a 1 gram sample size. A 2 gram sample size is targeted for collection in this program, therefore the QL for pg/solid sample fraction if 2 grams of solid material are collected would be one half that of the Analytical Method QLs. For example, for PCB-208 the Analytical Method QL adjusted for 1 gram is 1000 pg/g while the Project QL is 10 pg/sample. If 2 grams of solids are collected for a given sample, the Analytical Method QL for PCB-208 will be 500 pg/solid in the whole water sample collected (values listed for EDLs are similarly impacted). The Worksheet requires revision and, at a minimum, clearly documented text describing exactly how the values in Worksheet 15 were developed. (c) Correct the typo in the PAL column header from “pictograms” to “picograms.”	(a) The coeluters are treated as single peak so the QL is not increased by coelution. (b) Results will reported by the lab in pg/sample, not pg/g so assumptions about mass are irrelevant. The assumption of 1g was only made to provide consistency in per sample values. (c) The QAPP will be revised accordingly.

52	Worksheet 15, PCB Footnote C, page 10 of 15 and PCDD/F Footnote C, page 13 of 15	(a) Footnote C states that the laboratory will report data in units of pg/sample. Will the final EDD contain both the laboratory reported value (pg/sample) and the CPG's converted values (pg/g and pg/L)? (b) Co-eluting PCB congeners should be clearly established for a given lab and given instrumentation. Please provide an explanation as to why shifting co-elutions are an anticipated variable. Chromatographic resolution must be strictly controlled within the analytical system. Differences among labs due to differences in instrumentation may be expected but elution of congeners must be consistent for a given lab and instrumentation. (c) Footnote C, last sentence of first paragraph: "Not applicable" would be a more accurate definition for NA instead of "not available."	(a) The final EDD will contain both the laboratory reported values (pg/sample), and CPG's calculated values as pg/L. The QAPP will be revised accordingly. (b) The footnote will be reworded. (c) The QAPP will be revised accordingly.
53	Worksheet 16	Revise schedule as appropriate.	The QAPP will be revised accordingly.
54	Worksheet 17	Additional information on the sampling design and rationale is provided elsewhere in the QAPP such as Worksheet 14. Suggest adding a reference to Worksheet 14.	The QAPP will be revised accordingly.
55	Worksheet 18	Please re-order the sampling locations from north to south for ease of reference. Clarify why sampling depth is described as "one-three feet from bottom," instead of 3 feet above the bottom. Also, to have a fixed sampling point during sample collection, state how the tubing will be managed (*i.e.*, will sample collection be similar to the SV-CWCM program where the tubing was affixed to the water quality probe?).	The QAPP will be revised accordingly. The sample collection will be similar to the SV-CWCM program, as detailed in the field SOPs.
56	Worksheet 19	In regards to the PUF holding time of one year frozen, have the implications with regards to PUF sorbent material performance when frozen and defrosted been evaluated?	The PUF will not be frozen, but the maximum holding time will be 1 year. The QAPP will be revised to clarify.

57	Worksheet 20, Footnote C and SOP SW-19, page 9	(a) Clarify when the equipment rinsate blank will be collected during the sampling effort. The equipment rinsate blank should be collected between sampling locations, after equipment has been decontaminated. (b) State how the equipment rinsate blank will be collected and what volume of water will be filtered through the system for the equipment rinsate blank. (c) In SOP SW-19, Page 9, First paragraph, Item No. 2, when referring to the equipment blank, the same volume of analyte-free water should be pumped through the system as is anticipated for the surface water samples themselves, thereby mimicking sample exposure times for the control blank. One hundred seventy-five (175) liters is currently the smallest surface water sample volume planned. The stated 40 liters for equipment blank collection is not sufficient.	(a) The equipment blank will be collected mid-program, between sampling locations, after equipment has been decontaminated. The QAPP will be revised to clarify (b) Details are provided in SOP SW-19. The QAPP will be revised to reference the SOP. (c) The CPG agrees that 40 liter of water may not be sufficient for an equipment blank. However, pumping 175-800 liters of water would pose logistical concerns, including shipping of the water from laboratory, and handling large volumes of water in glass bottles on the boat. Furthermore, there is the consideration of the exposure of tubing to background contamination during the blank collection (since one single container cannot hold the total volume of water required to sample a large volume blank). To balance these concerns, the CPG proposes to use 100 liters of water in each equipment blank. The QAPP will be revised accordingly.
58	Worksheets 20 and 32	These sheets says, "If the HV CWCM program occurs within six months of the LRC SSP and RM 10.9 supplemental programs and the same laboratories will be used for the LRC SSP and RM 10.9 supplemental program analyses, a pre-program PE study will not be performed prior to the HV CWCM program." The PUF is a new matrix and due to the fact that the use of a PUF to extract dissolved organics has not yet been used during the previous studies. It would be prudent to run an aqueous PE sample through the PR2900 with filter and PUF in line to help evaluate the system's capability to extract know concentrations of dissolved PCBs and dioxins. A means to testing the effectiveness of the analysis of the filter using a PE would also be helpful but such a mechanism may not be possible with the available. In general, since the analytical methods and sampling techniques used in earlier programs are significantly modified in the high volume program, the accuracy and limitations of the data obtained will not be understood	Vendor certified PE limits are not available for PCBs and dioxins sorbed by PUF. Vendor water matrix limits are predicated on 1L extraction by sep funnel or CLLE only. HV sampling PEs are not commercially available and attempting to use a PE designed for another purpose would not be appropriate. No changes to the QAPP are necessary.

59	Worksheet 21, page 2 of 2, Footnote A, item 2	Clarify the volume of the carboy itself; volume sizes of 15L and 20L are used interchangeably throughout the QAPP. During the field demonstration, the carboy was described as a 20L carboy, and we understand that the intention is to capture 15L of sample within the 20L carboy during the duration of the HV sampling at each location.	The carboy is 20L, and the target fill volume is 15L. The QAPP will be revised accordingly.
60	Worksheet 21, page 2 of 2, Footnote A, item 4	When discussing the field duplicate for the POC, DOC, and suspended solids samples, clarify whether the field duplicate will come from the same carboy as the parent sample or if the field duplicate will come from the carboy associated with the "co-locate" PR-2900 unit.	The field duplicates will be collected at the same locations as the PR-2900 co-located field duplicates, and will be sampled from the co-located carboy. The QAPP will be revised to clarify this.
61	Worksheet 21, page 2 of 2, Footnote B	Per the 14 June conference call with the CPG, the LISST will be used to monitor suspended solids concentration but will not be used to adjust flow rates; these discussion points should be added to the SOP and QAPP. What are the advantages and disadvantages of deploying the LISST near the sonde vs. in-line, prior to the carboy?	The SOP and QAPP will be revised to clarify use of the LISST. Deploying the LISST near the sonde will deter potential contamination using the LISST in-line. Furthermore, deploying the LISST will provide a better overall picture of the solids distribution in the water column.
62	Worksheet 22	The PR-2900 should be added to Worksheet 22.	The QAPP will be revised accordingly.
63	Worksheet 23	For clarity, state that solid-phase sample will be one 8 oz jar consisting of the vortex separator water, the 25 um filter(s), and the 0.7 um filter(s). Moreover, the laboratory will handle this sample by adding a coagulant (Hydromatrix manufactured by Agilent Technologies, Inc.) and analyzing the sample as a solid in a Dean-Stark extractor. The PCB and PCDD/F fractions will be separated on-column.	The QAPP will be revised and will indicate glass wool, not a 25 um filter, will be used. The glass wool will be removed from the stainless steel container at the laboratory.
64	Worksheet 23	Method modifications will be necessary to accomplish analysis of solid phase and dissolved phase samples collected from the PR-2900 (*e.g.,* simultaneous co-extraction of PCDD/F and PCB congeners, modified spiking solutions and spiking protocols). The required modifications must be delineated here and also listed as stepwise procedures in the Analytical SOP Addendum.	A revised SOP Addendum will be provided. The QAPP will be revised accordingly.
65	Worksheet 27, bottom of page 1 of 4	During the SV-CWCM, the sample ID was distinguished with "A" for the top sample and "B" for the bottom sample. If HV samples are to be collected 3 feet from the bottom, then sample IDs should use a "B" to represent the bottom sample, to be consistent with the SV-CWCM naming convention.	The QAPP will be revised accordingly. Note that the sample collected above Dundee Dam will be an "A" sample, consistent with the SV CWCM QAPP.

66	Worksheet 28, General Comment	Worksheet 12 comments also apply to Worksheet 28. Please correct/revise accordingly.	The QAPP will be revised accordingly where appropriate.
67	Worksheet 28, General Comment	How many equipment rinsate blanks are expected to be collected during a single sampling event (6 stations) at the described rate of 1 per week per team? Please discuss if more than one blank is needed per event to address difficulties in equipment decontamination described by the CPG.	The CPG anticipates two equipment blanks will be collected, since up to two teams may be sampling. The sampling is anticipated to take less than one week. The QAPP will be revised accordingly. During the field demonstration, the PR2900 was decontaminated per the CWCM SOPs, and the equipment blanks did not show contamination. The difficultly with the equipment blank collected during AP's laboratory demonstration study may be rooted in the decontamination procedure. See response to comment #105.
68	Worksheet 28, General Comment for PCB and PCDD/F on Re-extraction as a Corrective Action	(a) Many corrective actions in this Worksheet indicate the re-extraction of samples when the QC criteria are not met. Due to limitations in the sample collection design, sample mass (particulate) and PUF (dissolved) material will not be available to re-extract. Remove "re-extraction" from corrective action options, or clarify whether a portion of the original extract will be archived in case a re-analysis is required. (b) Define the "B" qualifier in relationship to the QAPP, define what concentration is statistically significant relative to a sample, and recognize that there may be no sample available to re-extract.	a) The QAPP will be revised accordingly. b) AP uses the 1/10th rule for assignment of B qualifiers and assessment of impact. If the blank value exceeds 1/10 of the lowest associate sample concentration then the data may be impacted and a "B" qualifier assigned.
69	Worksheet 28, PCB Static Spike and Dynamic Spike (page 4 of 15) and PCDD/F Static Spike and Dynamic Spike (page 9 of 15)	Corrective action of NA (not applicable) for the PCB and PCDD/F static spike and dynamic spike is not appropriate. Details for monitoring of potential breakthrough should be provided since the recovery of the static spike and dynamic spike will impact quantification of the dissolved phase.	Static and dynamic spikes will not be used to adjust recoveries of target analytes. Only the labeled extraction standards are used to correct analyte concentrations using isotope dilution. Static and dynamic spikes recoveries are provided like surrogates to evaluate sampling performance. No change to the QAPP is necessary.

70	Worksheet 30	Data package turnaround time for PCBs and PCDD/PCDFs is shown as 45-60 days 45 days and 45 days, respectively. However, the Introduction, page 2 of 7, "samples will be sent to the laboratory for rapid analysis and turnaround (i.e., 30-day)." Although the footnote b of Worksheet 30 states the TAT is 30 days for the first event the table is a bit misleading.	The QAPP will be revised accordingly to distinguish between the expected TAT for the first and possible subsequent events.
71	Worksheet 32, page 4 of 4	See previous comments on the need to conduct a PE study.	See previous responses.
72	Worksheet 36	Due to the modifications to the analytical procedures as a result of the HV sampling protocols, direct use of the USEPA Region 2 validation guidance may be limited in application. Project-specific validation protocols should be developed in advance to limit debate on the professional judgment that will need to be applied.	Validation rules and actions will be added to cover the additional components (e.g. static and dynamic spikes) but the USEPA Region 2 guidance will be used for all data elements unchanged in the reference method or lab SOPs. The QAPP will be revised accordingly.
73	Worksheet 37, General Comments	(a) Worksheet 37 should clearly state that unit conversions will be completed on recovery corrected data. (b) How will qualified data be handled in the proposed unit conversions presented in Worksheet 37? (c) Clarify how the four time-integrated POC, DOC, and suspended solids samples will be incorporated into the unit conversion calculations. Suggest including this information on Worksheets 14 and 17 as well.	(a) Recovery corrected data will be propagated through any subsequent unit conversions. The QAPP will be revised to clarify the procedures, (b) Validation qualifiers will be propagated through any subsequent unit conversions. The QAPP will be revised the clarify the procedures (c) The average concentration will be used in the unit conversion calculations. The QAPP will be revised accordingly.
74	Worksheet 37, page 1 of 4, "Describe the evaluative procedures"	First paragraph (fifth line down) - "…or as the users…" seems to be stray text.	The QAPP will be revised accordingly.

75	Analytical SOP No. AP-CM-13 DF High Volume Sampling Addendum	The SOP provides a few limited details regarding modifications to the base procedure which is SOP No. AP-CM-5 Rev.15, in order to accommodate samples for Dioxin/Furan analysis when collected from the PR2900 sampling equipment. Note the base procedure (SOP AP-CM-5) is similar to USEPA 1613B but includes modifications to the USEPA method. The limited details in the high volume addendum are related to three new categories of carbon-labeled spiking mixtures, namely the dynamic standard field spike (DS), static standard (SS), and an alternate cleanup standard (AS). Please provide additional detail by expanding text in the SOP to fully describe all stepwise procedures planned. The following items are not covered in the SOP and should be addressed: i.Description of necessary adjustments to the remaining analytical carbon-labeled spike mixtures. For example, standards included in the new high volume specific mixtures must be removed from the "extraction standard." As written, neither the base SOP nor the HV Addendum DF are clear or defined regarding the spiking protocols to be carried out by the bench chemist at the lab or by the field crew. ii. No text is provided to describe how samples will be stored at < -10 degrees Celsius at the lab or how/if they will be brought to ambient temperature prior to extraction. This is the temperature requirement identified in the QAPP. The current SOP indicates "samples are stored at 4 degrees Celsius, extracted within 30 days and completely analyzed within 45 days." This holding time and storage temperature is in conflict with QAPP Worksheet #19. iii. No text has been provided in the HVS Addendum DF regarding sample handling of the particulate phase samples collected. How will the solid material be transferred quantitatively to the Soxhlet Dean Stark (SDS) apparatus, assuming the entire contents of the sample will be extracted? Currently the base procedure indicates a 10 gram sample will be sub-sampled from the field container. When will Hydromatrix be added, etc.? Definition of these steps will be	i) The new carbon labeled standards are not "removed". Recoveries are calculated in reference to the extraction standards unless otherwise specified in the SOP or SOP addendum. ii) The SOP details and QAPP details will be made consistent with respect to preservation conditions. iii) Additional details will be provided in revised SOP addenda. iv) Static spikes will be used to monitor breakthrough of the PUF sorbent. Dynamic spikes will used to evaluate capture efficiency of dissolved target analytes. Uncaptured analytes due to colloidal or DOM sorption cannot be monitored and are beyond the scope of this technique. Sorption of uncaptured analytes may be indicated by low dynamic spike recovery, but the exact causes of reduced recovery will not be determined by this analysis. v) Additional details will be provided in revised SOP addenda. vi) These calculations are outside the scope of the laboratory SOP and will be provided in the HV CWCM QAPP, Worksheet #37.

		especially important since the particulate phase sample will be a combination of several filters and material from the vortex. iv. Current documentation (QAPP, field and lab SOPs) indicate that only one PUF cartridge will be collected per sample location. Air sampling protocols commonly include two serial PUFs. The second PUF is used to monitor/capture breakthrough of analytes in the sampling system. Per AECOM's conference call with USEPA on June 14, 2012, the dynamic and static spikes will be used to evaluate potential breakthrough. Specific details indicating exactly how loss of dynamic and/or static spikes will be attributed to breakthrough in the sampling device versus losses of the spike compounds during laboratory extraction, clean-up and analysis must be provided in the field and analytical SOPs. This is particularly important aspect in the monitoring of the overall field sample collection and analytical performance since the preliminary field trial of the HV sampling equipment yielded low recoveries of nearly all HOCs in the colloidal dynamic spike (representing dissolved phase analytes). These phenomena may be related to breakthrough. v. If the entire contents of the particulate sample container (filters and vortex contents) are to be analyzed for dioxin/furans and congener PCBs as one aliquot rather than separate 10 gram sub-samples as currently indicated in the SOP, the same issues regarding the combined extraction and analysis of dioxin/furans and congener PCBs must be addressed in a thorough stepwise SOP as requested in the bullet above for the PUF. vi. Calculations are not provided describing exactly how results for particulate and dissolved phase analyte concentrations will be determined based upon other measurements such as total volume of water collected and SSC. The calculation and result reporting steps of this program are unique and must be included in the laboratory SOP.	
76		The SOP provides limited details regarding modifications to the base procedure which is SOP No. AP-CM-7 Rev.9-1, in order to accommodate samples for Congener PCB analysis when collected from	

	Analytical SOP No. AP-CM-14 Rev. 1 DF, PCB High Volume Sampling Addendum	the PR2900 sampling equipment. Note the base procedure (SOP AP-CM-7) is similar to USEPA 1668 but includes modifications to the USEPA method. The limited details in the high volume addendum are related to three new categories of carbon labeled spiking mixtures, namely the dynamic standard field spike (DS), static standard (SS), and an alternate cleanup standard (AS). Please provide additional detail by expanding text in the SOP to fully describe all stepwise procedures planned. The following items are not covered in the SOP and should be addressed: i. Description of necessary adjustments to the remaining analytical carbon-labeled spike mixtures. For example, standards included in the new high volume specific mixtures must be removed from the "extraction standard." As written, neither the base SOP nor the HV Addendum PCB are clear or defined regarding the spiking protocols to be carried out by the bench chemist at the lab or by the field crew. ii. The introductory text of the HVS Addendum PCB includes the following: *This procedure creates multi-component samples analogous to air samples; the extraction of these samples follows the same air extraction procedures used when no split or archive is required (See section 14.1.6 of SOP AP-CM-7, Revision 9-1.* No further description or directives are provided in the HVS Addendum PCB related to the creation of multi-component samples. Further, the base procedure SOP No. AP-CM-7 Rev.9-1 does not provide explicit details regarding the creation of multi-component samples. If the lab's term "multi-component sample" refers to the analysis of PCBs in conjunction with dioxin/furans, the base SOP No. AP-CM-7 Rev.9-1 indicates that "custom-made charts are used to help with the description of spike profiles, the sample handling and extractions" on a project specific basis only, and therefore are not included in the base SOP. These steps (if intended) are critical to the analyses of the high volume samples and must be provided in a thorough step-wise SOP.	i) The new carbon labeled standards are not "removed". Recoveries are calculated in reference to the extraction standards unless otherwise specified in the SOP or SOP addendum. ii) Additional details will be provided in revised SOP addenda. iii) The SOP details and QAPP details will be made consistent with respect to preservation conditions. iv) Additional details will be provided in revised SOP addenda. v) Static spikes will be used to monitor breakthrough of the PUF sorbent. Dynamic spikes will used to evaluate capture efficiency of dissolved target analytes. Uncaptured analytes due to colloidal or DOM sorption cannot be monitored and are beyond the scope of this technique. Sorption of uncaptured analytes may be indicated by low dynamic spike recovery, but the exact causes will not be determined by this analysis. vi) Additional details will be provided in revised SOP addenda. vii) Additional details will be provided in revised SOP addenda. viii) These calculations are outside the scope of the laboratory SOP and will be provided in the HV CWCM QAPP, Worksheet #37.

		No text is provided to describe how samples will be stored at <-10 degrees Celsius at the lab or how/if they will be brought to ambient temperature prior to extraction. This is the protocol identified in the QAPP. Current SOP indicates "store solid, semi-solid, oily, and mixed-phase samples in the dark at 2-6 degrees Celsius," and samples stored at 4-6 degrees Celsius, are extracted within 30 days. Both the holding time and storage temperature are in conflict with QAPP Worksheet #19. iv. No text has been provided in the HVS Addendum PCB regarding sample handling of the particulate phase samples collected. How will the solid material be transferred quantitatively to the Soxhlet Dean Stark (SDS), assuming the entire contents of the sample will be extracted? Currently the base procedure indicates a 10-20 gram dry weight equivalent sample will be sub-sampled from the field container. When will Hydromatrix be added, etc.? Definition of these steps will be especially important since the particulate phase sample will be a combination of several filters and material from the vortex. v. Current documentation (QAPP, field and lab SOPs) indicates that only one PUF cartridge will be collected per sample location. Air sampling protocols commonly include two serial PUFs. The second PUF is used to monitor/capture breakthrough of analytes in the sampling system. Per AECOM's conference call with USEPA on June 14, 2012, the dynamic and static spikes will be used to evaluate potential breakthrough. Specific details indicating exactly how loss of dynamic and/or static spikes will be attributed to breakthrough in the sampling device versus losses of the spike compounds during laboratory extraction, clean-up and analysis must be provided in the field and analytical SOPs. This is particularly important since the preliminary field trial of the HV sampling equipment yielded low recoveries of nearly all HOCs in the colloidal dynamic spike (representing dissolved phase analytes). These phenomena may be related to breakthrough. vi. If a single PUF is collected, how will analyses of both dioxins/furans and congener PCBs be performed? Assuming a co-extraction, combined carbon label spiking protocol, possible split of extract, separate or combined analyses of extracts	

		would be necessary, to provide for analysis of all HOCs from one PUF. None of these steps, issues, or even a planned approach in general are provided for in the HVS Addendum PCB. Please explain exactly what the planned approach to the single PUF analysis for dioxin/furans and congener PCBs will be, and provide a thorough stepwise SOP to document the planned procedure. vii. If the entire contents of the particulate sample container (filters and vortex contents) are to be analyzed for dioxin/furans and congener PCBs as one aliquot rather than separate 10 gram sub-samples as currently indicated in the SOP, the same issues regarding the combined extraction and analysis of dioxin/furans and congener PCBs must be addressed in a thorough stepwise SOP as requested in the bullet above for the PUF. viii. Calculations are not provided describing exactly how results for particulate and dissolved phase analyte concentrations will be determined based upon other measurements such as total volume of water collected and SSC. The calculation and result reporting steps of this program are unique and must be included in the laboratory SOP.	
77	Analytical SOP C-16, Rev.01	The SOP does not include determinative analytical steps, nor is a companion SOP included that delineates determinative steps (e.g., instrument calibration, sample concentration calculations, etc.). The SOP therefore is incomplete.	An additional determinative SOP will be added to the QAPP tables and Appendix B

78	SOP SW-19, Editorial Comments	(a) Please correct typo in the first sentence of page 1; GFF is to be a 0.7 um filter (not a 7 um). (b) In first sentence of second paragraph on page 1, please delete the word "samples" and remove the analyte "pesticides" from the list of targeted organics for the HV-CWCM program. (c) In the first sentence of the third paragraph on page 1, suggest re-wording to "Sampling *small volumes of* ~~unfiltered~~ water for HOCs may yield *concentrations* ~~quantities~~ too low to be detected…." (d) In the fourth paragraph on page 1, add a closed parentheses after the phrase "Trace Metals" on the second line. (e) In the fourth paragraph on page 1, remove the word "also" from the sentence "Water samples will also be analyzed for organic compounds and conventional parameters…" (f) In the first paragraph on page 2, please revise the wording to avoid suggesting that the PR-2900 is primarily a pump (second line). (g) On page 4, just above the "Sample Handling" section, add a sentenced stating that intermittent filter changes will be required prior to filtering the entire desired volume. (h) In Attachment #2 (and throughout the QAPP), consider listing locations from North to South, beginning with Dundee Dam and ending with the Kill Van Kull, for ease of reference.	(a) The SOP will be revised accordingly. (b) The SOP will be revised accordingly. (c) The SOP will be revised accordingly. (d) The SOP will be revised accordingly. (e) The SOP will be revised accordingly. (f) The SOP will be revised accordingly. (g) The SOP will be revised accordingly. (h) The SOP will be revised accordingly.
79	SOP SW-19, page 3, paragraph 1	How will the pump outflow be checked during sampling? Will the tubing be disconnected before the vortex?	Pump outflow will be checked from the discharge tubing. Tubing will not be disconnected before the vortex. This will be clarified in the SOP.
80	SOP SW-19, page 4, paragraph 2	Provide rationale on why the dynamic spike is added after half the desired volume is filtered. The spike should be added at the beginning of the filtration process, or a "wash-out" spike should be added at the beginning of the filtration process.	The dynamic spike should be added only after the pump rates and flows have stabilized. The SOP will be modified to introduce the dynamic spike earlier during sampling. The spike was introduced after the first 10 liters in the field demonstration.
81	SOP SW-19, page 8, Step No. 6	For clarity, state that the water from the vortex separator will be added to the same 8 oz jar as the 0.7 um and 25 um flat filters.	The 0.7 um filters and solids plus water from the vortex separator will be in the same sample jar. The glass wool will be in a separate container (i.e., similar to the PUF stainless steel cartridge) and shipped to the lab

			intact. The SOP will be revised accordingly.
82	SOP SW-19, page 7, Step No. 8	Specify where the weight will be located in relation to the instrument array and tubing inlet.	The weight will be located approximately 3 feet below the instrument array and tubing inlet, consistent with SOP LPR-FI-04. SOP SW-19 will be revised accordingly.
83	SOP SW-19, page 8, Step No. 10	When discussing the transfer of the vortex separator sample to the 8 oz jar, explain how residual particulate sample volume/mass remaining in the vortex separator upon completion of all sample collection steps will be quantitatively transferred to the particulate phase sample container.	The SOP will be revised accordingly.
84	SOP SW-19, page 9, paragraph 1, Item No. 1	"Talex" water should be defined as to the meaning, quality, and source as it is not an industry or government standard specification.	The SOP will be revised accordingly.
85	SOP SW-19, page 9 "Decontamination " Item No. 5	Clarify what type or quality of "water" will be used in this step. Also, to avoid confusion, write-out deionized water instead of using the acronym DI.	The SOP will be revised accordingly.
86	SOP SW-19, page 10, Item No. 11	Clarify whether the filtering system is allowed to air-dry prior to securing the system with aluminum foil.	The SOP will be revised accordingly.
87	SOP LPR-FI-04, Section 1.1 and elsewhere	Revise SOP LPR-FI-04 since phrases such as "High-volume sampling techniques are beyond the scope of this SOP" (Section 1.1) are still present.	The SOP will be revised accordingly.
88	SOP LPR-FI-05 Section 5.3.2, page 3, paragraph 2	Will there be any measurements recorded manually in the event that the data logging file is corrupted or does not log?	The field team log book will also be used to record start and stop times, volume pumped, pump rate, and document filter changes. The SOP will be revised accordingly.
89	SOP LPR-FI-06, Section 1.2	The SOP states: "Use of this SOP is restricted to metals, including but not limited to low-level mercury, methylmercury and hexavalent chromium." This SOP needs to be revised to address other analytes of interest for this HV CWCM program.	The SOP will be revised accordingly.
90	SOP LPR G-01, page 2, Section	The camera should not be listed as an optional piece of equipment.	The camera is an optional piece of equipment for the LPRRP program. The SOP will not be modified on this

	4.0		
91	SOP LPR-G-02 page 1, Section 3.0	Include statement that bad weather/overcast conditions can also cause interferences/poor satellite coverage.	The SOP will be revised accordingly.
92	PUF vs. XAD Comparison, page 1, paragraph 2	For clarity, state that PCB and PCDD/F were co-extracted and fractionated on-column.	The PCBs and PCDD/Fs were co-extracted and fractionated on the column. Note that for Comments #92 – 100, the CPG will not be revising the memorandum, as it was an internal document sent from AECOM to dmi. The responses to the comments answer USEPA's questions.
93	PUF vs. XAD Comparison, page 1, paragraph 2	Regarding methanol used to deliver the dynamic spike, could this interfere with recovery efficiency on the PUF or XAD? Could constituents sorbed on dissolved organic matter be less/more readily captured on XAD/PUF when introduced in a methanolic mixture?	The methanol is water miscible and should be mixed by turbulence and quickly diluted in the sample water stream. The effects of low level methanol on target analyte sorption are unknown, but Gravity is not aware of any previous project where breakthrough or capture efficiency problems were attributable to the methanol solvent.
94	PUF vs. XAD Comparison, page 1, paragraph 2	If this is intended to "…verify that, in a controlled laboratory environment using large volumes of clean water, the combined sampling-analytical system could produce acceptable recoveries…" then the laboratory study needs to mimic the real-world application or the test may be invalid. In the study, only 50 liters were filtered while field work will require the filtration of hundreds of liters.	The volume of water should be largely irrelevant if the capture efficiency is constant. The static spike will capture breakthrough effects in higher sampling volumes.
95	PUF vs. XAD Comparison, page 2, Paragraph 2	Paragraph starting "The overall methanolic DS average recovery…" (a) Describe corrective action that will be implemented in the field to ensure that the PR-2900 is adequately decontaminated prior to sampling and between locations. (b) Fourth sentence: How will the native PCB recoveries that were not usable be dealt with during field use and re-use? Where was the background PCB source from in previous runs? Can it be confirmed that there were no other constituents in the previous runs that could have been background contaminants? (c) Seventh sentence: This sentence is unclear. Was it in the previous	a) Details about the planned hexane rinse decontamination are provided in Gravity SOP 19. b) The exact contamination source was unknown, but the HV field demo did not encounter similar problems, so proper cleaning should eliminate cross contamination. c) The previous use of the PR2900 is believed to be

		runs that caused background contamination or was it in the background analytical results?	the source of the PCB contamination, not the lab use or prep/analysis.
96	PUF vs. XAD Comparison, page 2, paragraph 2	When stating that the XAD efficiency is 78%, the amount of XAD resin used in the comparison should be provided.	Approximately 60 g of XAD was used in the study.
97	PUF vs. XAD Comparison, page 3, paragraph 2	(a) Third sentence: What does the poor recovery of the colloidal dynamic spike suggest about the ability of this system to identify/quantify analytes specific to the apparent dissolved versus solid phase of the water column? (b) Fourth sentence: Was the spike trapped by the filter and the vortex or just the filter? (c) Last sentence: What is the relevance to the target constituents in the media sampled? Could the solids have been captured but not detected by the lab instruments/analytical method?	a) Some colloidally bound HOCs may not be captured by the sampling and analytical system. Quantifying those losses is not part of the system design. b) The spike was trapped by the filter. c) Good extraction efficiency is indicated by the labeled extraction standard recoveries. All captured targets should be detected if concentrations exceed the instrument sensitivity.
98	PUF vs. XAD Comparison, page 3, paragraph 1	Describe the corrective action that will be implemented in the laboratory to minimize loss of PCDD/F extraction standard during cleanup.	The AP SOP Addenda will be revised accordingly.
99	PUF vs. XAD Comparison, page 3, 2nd summary bullet	Can any mitigation steps be implemented to account for the loss of mass associated with the colloidal phase (which passes through the PUF and is not accounted for)?	Not with the existing sampling and analytical system. Only captured target analytes can be measured.
100	PUF vs. XAD Comparison, Appendix 1, page 17	Specific to the PCDD/PCDF recoveries table, the $^{13}C_{12}$-OCDD recovery is 832.0. Is there a possibility this is a typographical error? Address as necessary.	No, this appeared to be an anomaly generated by equipment contamination. This appeared in the initial run only and not in later lab demonstration samples or the field demonstration data.

101	General Comment 2, page 1 of 15	The SOPs are incorporated into the draft QAPP but analytical SOP Nos. AP-CM5 and AP-CM-7 still do not clearly describe the extraction procedures to be used for the PUF and filter/vortex rinse matrices that will be produced from this sampling event. The extraction processes described in the SOPs are cobbled together from the air sampling and apparently the tissue extraction procedures previously submitted. For example, the extraction procedure that will presumably be used for the PUF discuses combining XAD-2 resin and filter in a SDS extractor. This is a small detail since in the introduction to the section it is stated that "Each sampling is usually comprised of a filter, a XAD-2 resin trap, solvent rinses…" where the term "usually" may cover the case were XAD resin is not used. Yet is can lead to confusion in the extraction process. Additionally the tissue extraction that presumably we be used to extract the filters/vortex rinse describes adding 20-25 grams of Hydromatrix TM and "stir until a dry, free flowing consistency is achieved". Is this to be done in the sample jar before or after the filters are removed? These are unique matrices not PUFs from air sampling and certainly not a tissue or soil/sediment matrix. In the case of the filters there will be multiple filters along with the vortex rinse to transfer and extract. In order to evaluate the extraction procedure that will be used to process the PUF and filter /vortex rinse and to insure that the split samples are handled in a consistent manner the laboratory must provide a detailed transfer and extraction procedure for both the PUF and filter/vortex rinse matrices not simply try to work them into an existing extraction procedure.	The SOP addendum will be revised accordingly.
102	Comment 13, page 6 of 15	The SOPs did not adequately address this comment. See review of General Comment 2 above. Specific extraction procedures for HV water sampling PUFs and filters/vortex rinse need to be added to the analytical SOPs.	The SOP addendum will be revised accordingly.
103	Comment 14, page 6 of 15	The SOP addenda contain the information requested, but data quality criteria are normally included on QAPP Worksheets and note that the quality control criteria in the referenced lab SOPs. The SOP addenda contain this information.	QAPP worksheets will be edited for consistency with the revised SOPs.
104	Comment 18, page 8 of 15	Related to this comment – the CPG has not provided the data related to the field test. The field test analytical data would help better evaluate the CPGs response to this comment. It would also provide some insight into	A report on the field test will be provided to USEPA

		the analytical process and potential challenges that might be encountered.	
105	Comment 20, page 9 of 15	The PUF vs. XAD study indicated that the PR-2900 system had an issue with PCB contamination. Please clarify if the PR2900 system used for this study was decontaminated following the procedure described in the Gravity SOP.	The laboratory study conducted by AP and Gravity was not sponsored by the CPG. Prior to the study, the PR2900 was used at a site with known PCB contamination. Upon review of the data, Gravity indicated that hexane was not used to decontaminate the PR2900 prior to use in the study. As provided in the QAPP and SOPs, hexane is part of the decontamination procedure in the LPRSA-specific SOP provided in the QAPP, and all decontamination will include hexane during sampling at the LPRSA (and NBSA).
106	Comment 23, page 9 of 15	The revisions to the analytical Perspectives SOP do not adequately address the question regarding the analysis of the filters and vortex rinse. The handling and extraction of the portion of the SOPs need to be greatly enhanced	The SOP addendum will be revised accordingly.
107	Comment 5, page 12 of 15	Analytical SOP for Dioxins/Furans: The CPG response for comments b, d & f do not adequately address the comments. Analytical Perspectives SOPs do not adequately describe the handling and extraction procedures for PUFs use for high volume water sampling or the filter/vortex rinse matrices.	The SOP addendum will be revised accordingly.
108	Comment 6, page 13 of 15	Analytical SOP for Congener PCBs: The CPG response to comments b, d & f do not adequately address the comments. Analytical Perspectives SOPs do not describe the sample handling and extraction procedures for the PUFs used for high volume water sampling and filter/vortex rinse matrices	The SOP addendum will be revised accordingly.
109	Comment 13, page 15 of 15	Recommend that the response to this comment be added to the QAPP: "Each filter will be packaged separately during the HV sampling, minimizing exposure of the unused filters to ambient conditions. Filter changes will be conducted as efficiently as possible, minimizing ambient exposure."	The SOP SW-19 will be revised accordingly.

110	General Comment	How does the CPG plan to develop boundary conditions? We are looking for specific references to available data, including that from the small volume CWCM program data, rather simply a generic or qualitative approach. This can be described either in the QAPP or in a separate memo, whichever you think makes more sense.	The HV CWCM program stations above Dundee Dam and in the Kill van Kull will provide data for use in refining model boundary conditions. How these data will be used in conjunction with other data to establish boundary conditions is beyond the scope of the QAPP. There are no plans to develop a memo on boundary conditions. Rather, the discussion of boundary conditions will be part of the final modeling report.
111	Worksheet #11	The QAPP has been modified to acknowledge that sampling at the tidal boundary on an incoming tide will not be attempted (Worksheet 11 - "To the extent possible, the window of time for incoming tides will be targeted for tidal boundary locations."), but still includes sample collection at the tidal boundary on an outgoing tide. This could distort the characterization of the boundary conditions. It would be better to limit sampling to the incoming tide and deploy a second sampler, rather than extend the sampling into the period of the outgoing tide.	The CPG will consider deploying a second sampler at Kill van Kull to target the incoming tide. Sampling at Kill van Kull will be conducted later in the field program, so that the actual time required to collect samples of various volumes as well as the number of filter changes required per station is better understood. To the extent possible, the CPG would prefer to sample the boundary conditions using only one sampler. This would minimize uncertainty associated with summing data from two samplers, as well the potential increase in number of filter changes required with two sampling units. Should the anticipated sampling duration exceed the time from slack low to slack high (i.e., the incoming tide), the CPG will confer with USEPA and develop a field modification.