EPA Comments on Comprehensive Round 2 Site Summary and Data Gaps Analysis Report
Sections 1 – 9 and Appendices A, B, C, D, F, and G
January 15, 2008

Comment Number	Subsection	Page Number	Cat	Comment/Summary	LWG Response and Resolution
4	General Comment	N/A	2	The Draft Remedial Investigation (RI) and Baseline Risk Assessment (BRA) Reports should each include a comprehensive executive summary. Although an executive summary of the type included in the Round 2 Report may be produced by the Lower Willamette Group (LWG), it should be considered a standalone document produced for LWG's benefit and should not be included as part of the draft RI or BRA.	LWG requests clarification on preparation of executive summary. EPA would like to see an executive summary that covers the entire report and not a 4 page summary. (Eric)
26	3.3	3-5	2	Overland transport is not a direct discharge; thus, the "/" should be a "," between "waste water" and "overland transport." Overwater activities should be included as a pathway in this sentence. Historical sources are not a pathway; thus, "and historical sources" should be omitted from this sentence.	Question as to whether overland discharge is a direct discharge and the relationship to historical sources. Not sure it matters how we classify overland transport. Regarding historical sources, historical sources contribute to all pathways. (Kristine)
61	Figures	Figure 3.0-1	2	A number of pathways are omitted in the human health CSM – e.g., contaminated banks, overwater work, evaporation, drinking water, harvesting shellfish. Further, Transition Zone Water should include a link to contaminated groundwater and upland source areas, and the arrows for Overland Runoff should be directed to the river. A revised CSM should be included in the draft RI Report.	LWG has question about "evaporation." Points out that this is just a cartoon. Evaporation is not significant. The revised figure should be fine (Eric).
69	4.1.4	4-6	4	The Report states that "…considerable areas [of outfall drainage basins] were not characterized into either category [overland flow vs. outfall conveyance]." These characterizations should be completed for the draft RI Report.	LWG states that addressing this comment will take a substantially amount of work and is not necessary. Address comment in context of stormwater loading methods (Kristine).
76	4.3.3.2	4-16	2	The draft RI Report should also include a summary of flow conditions when both the Willamette and Columbia Rivers are at high flow.	LWG states that this condition does not occur. The Columbia and Willamette Rivers often exhibit similar flow conditions. For example, during the 1996 flood, the Willamette was running at 400K cfs but high water conditions in the Columbia causes sediments to drop out of suspension at some locations (Eric).

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78	4.4.2.3.2	4-22	2	The suspended sediment City data (2001-2006) presented in 4.4-3a do not include very high flow events (e.g., greater than 200,000 cfs). The draft RI Report should discuss how this may affect predictions.	Question as to how the presentation may affect predictions. The point of EPA's comment is that the lack of TSS data correlated with extreme high flow events may affect the ability to predict such high flow events (Kristine/Eric).
94	Exec Summ	ES5-i	3	EPA disagrees with the statement that historical sources have largely been controlled. Perhaps is it is a matter of what is meant by historical source; however, there are still several historical sources which are significant to the Study Area (e.g., GASCO, Siltronics, Arkema, Gunderson, Willamette Cove, Oregon Steel Mills, etc.). In addition, groundwater should be identified as a significant pathway due to the number of chemicals in TZW that exceed screening criteria even though it may not present a risk from a site-wide perspective.	LWG generally will address comment but wants clarification on the term significant pathway and would like to note that TZW may be impacted by contaminated sediments. EPA generally agrees with statements. With respect to the term "significant pathway" EPA would like to reiterate that while groundwater discharges may not be "significant" from a harbor wide standpoint, localized effects may be significant (Eric/Kristine).
100	Exec Summ	ES5-iii	2	The Report makes the statement that "… current wastewater discharges are probably a negligible pathway to the river due to regulatory controls." EPA disagrees with this statement. Please see the comment on Sections 3 and 4, above.	LWG will add language that should address comment. As a broader comment, the draft RI Report should avoid generalizations. Generalizations are often inaccurate for a large, complex site like the PH site (Eric).
103	5.1.2	5-7	4	Sites at which groundwater COIs are present above screening levels in both groundwater at the riverbank and in TZW should be identified as having a complete groundwater pathway to the Willamette River. TZW data should be considered in the design of upland source control measures and in-water sediment remediation. See comments on the evaluation of TZW in the human health and ecological risk assessments.	LWG states that the role of bulk sediment contribution to TZW needs to be assessed in each case. EPA generally agrees with this response. However, in the absence of definitive information regarding the contribution of bulk sediment, EPA believes that TZW data may be used to determine whether groundwater discharge is a complete pathway. It should be noted that the TZW investigation was limited in spatial and temporal scale (Eric).
104	5.1.2	General Comment	2	In general, the evaluation of TZW should consider data on the upland groundwater contamination plume and should understand the connection with the river through the groundwater and Transition Zone Water (TZW) samples. Although large scale plume loadings (Table D4-2, for example) based on mean and maximum flows and loadings may be used to evaluate the loading to surface water resulting from contaminated groundwater discharges, this scale is not relevant when looking at effects on the benthic community or uptake by benthic organisms directly exposed to groundwater contamination. The evaluation in the draft RI Report should focus on defining a source area, defining the flow path of the ground water plume and its concentration at different points along that path, and using that information to evaluate the risks associated with TZW.	The LWG states that the data set does not exist to address the comment and that this goes beyond the scope of the TZW investigation. Unclear how to address at this time (Eric).

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105	5.1.2	General Comment	2	The ground water discharge zones presented in this section are identified solely based on the locations where TZW measurements were taken. The draft RI Report should include areas where there is the likelihood of groundwater discharge based on the topography, actual data from uplands, data from TZW samples, and even interpretations from sediment characteristics. In general, most of the site should have groundwater discharges to the river based on uplands near the river and porous formations where groundwater flows. The areas where actual measurements were taken can then be separated from those more general discharge zones.	The LWG will note that groundwater discharge is expected to occur over most of the study area. The LWG states however that it is inappropriate to assume that all upland areas represent sources of contamination to the river, sediments or TZW. The proposed response appears adequate (Eric).
106	5.1.3.1.1	5-8	2	The sources provided in the Report for the development of the drainage maps (Maps 4.1-1a-i) do not provide all information on the upland drainage areas to the river. This should be addressed in the draft RI Report.	The LWG is requesting clarification form EPA regarding what is missing. Further clarification from EPA is required (Kristine).
112	5.1.3.1.4	5-13	2	EPA disagrees with the statement that data used for source tracing have little or no value for determining source loads. The concentrations found in source tracing could be used with regional storm records and drainage basin acreage to determine loadings, although there would be greater uncertainty in these loading rates than in those derived from other data.	LWG notes that this will be addressed through stormwater loading evaluation Address comment in context of stormwater loading methods (Kristine).
113	5.1.3.1.4	5-14	2	While it is ideal to have similar data collected throughout the site to equally represent all discharges, it is an unrealistic expectation, and the data collected should be used to evaluate the discharge from that outfall. The current data collection and extrapolation efforts being conducted through the Round 3 Stormwater investigation should be verified using other data, such as source tracing data, as another line of evidence. Although using different data sources to determine stormwater loading may be difficult, especially when it only represents a portion of the drainage basin, it does not mean that it should not be done. These types of loading would be qualified as potentially under- or over-estimating the true loading. It should be acknowledged that there is uncertainty associated with using partial storm season data at a few sites (30 of 311) and extrapolating these data to the whole storm season, then extrapolating them to other sites, then extrapolating it to multiple years.	See above. Address comment in context of stormwater loading methods (Kristine).

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119	5.2.2	5-19	2	The draft RI Report should consider the impact of the various TMDLs on contaminant loading to the Portland Harbor site. For example, are these TMDLs sufficient to prevent contamination in river sediments and reduce risk to acceptable levels, or should they be re-evaluated?	The LWG states that it is beyond the scope of the FS to determine the adequacy of other programs such as TMDLs. The point of EPA's comment is for the RI/FS to note that further reductions in watershed contaminants is likely as a result of TMDLs and other watershed efforts (Eric).
121	Sec 5 Tables	Table 5.1-2	2	The RI should assume that the conceptual model of discharge from uplands to the river is the starting point to make the pathway connection. Unless there are data to show that there is some special reason why this logical conceptual model is incorrect (e.g., documented reverse gradients, a fully controlling barrier wall system, etc.), all the sites should be assumed to be in direct connection with the river.	The LWG does not understand how this comment would change the table EPA's comment is that a complete pathway should be assumed if a release has occurred and there is no data to indicate that the release is not likely to impact the river. This may change some of the conclusions in the table and was used as the basis for EPA comments (Eric/Kristine).
177	Maps	Maps 5.11a-h	2	These maps need to show the source area and extent of all upland groundwater plumes. The evaluation of upland sources is not limited to current sources, but also includes future potential sources.	LWG is unclear whether the last sentence is a recommendation for the report. The point of EPA's comment is that the evaluation of upland groundwater plumes should allow for future contaminant migration (Eric/Rene).
179	General Comment	N/A	4	EPA comments on the 2006 Groundwater Pathway Evaluation Report do not appear to be incorporated into the Round 2 Report. For example, there are potential errors in the preparation of the Piper Diagrams and/or Stiff Diagrams, and misleading presentations of the data where data from different locations are combined. These comments should be incorporated into the draft RI Report.	The LWG requests clarification regarding what comments are not incorporated considering the scope of the RI. EPA will provide specifics (Eric/Rene)
194	6.2.2	General Comment	2	The Report needs to include clear statements of the uncertainty <u>for each major topic of discussion</u> (such as the major ions, variability in COCs concentrations, estimates for the modeled stream flow parameters and results [or conclusions]).	The LWG states that this comment appears to be in conflict with EPA's desire for a streamlined approach. Further clarification on this comment is necessary (Eric/Rene).

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195	6.2	6-40	2	There is a significant amount of TZW data, but only at nine areas of suspected contamination based on documented upland sources (plus the Siltronic site during independent study). The Round 2 Report then attempts to extrapolate that data interpretation to the rest of the river. The data should only be used for the sites where it was obtained, and only in general make any assumptions about other sites or areas not sampled. The TZW data documents impacts correlated to the upland contamination at all nine sites that were sampled. Attempting to make river-wide conclusions based on those data is not appropriate or acceptable. Any additional extrapolation should be carefully worded, with a disclaimer as to its reliability and its high degree of uncertainty.	The LWG states that it is unclear what EPA's specific objections are and suggests that limitations are clearly identified in the text. We need to provide clarification (Eric/Rene).
197	6.2.2	6-45	2	The draft RI Report should consider using Mn and Fe as tracers of contamination emanating from uplands or unstable geochemistry due to other sediment contamination, not just a curious result that can be ignored because it occurs throughout the river. Note that Mn is not widespread at every site, and is mostly correlated with high concentrations of contamination. For example, note that where all the Mn data are plotted "by site" (as done for OSM in July 21, 2006 Memorandum, Figure 5-9), there are large ranges of values for any one site. Also, if the sites are viewed in more detail, as has been done for BP Bulk Terminal 22T (Source Control Implementation Report July 2006), the elevated Mn concentrations are mostly related to the wells along contamination plumes. This is also true for the GASCO site (2006 Report, Figure A-41) and Christenson Oil site (Figure 4, Second Quarter 2007 Report). Ultimately, the draft RI Report should present a site-by-site analyses, with correlation of other contamination data and with less emphasis on river-wide comparisons.	The LWG states that the ions in question may be the result of natural conditions or of contamination. EPA agrees that the evaluation of Mn, Fe, As and Ba is a complex undertaking. EPA and the LWG should discuss how this evaluation should be performed to better understand the contribution of these ions from contaminated sediments and groundwater and associated with naturally occurring reducing conditions (Eric/Rene).
207	6.4.2	6-69,70	2	It should be noted that with the exception of sculpin and clams, it is difficult to draw too many conclusions regarding the distribution of contamination in biota tissue. Limited conclusions may be made regarding crayfish and smallmouth bass. However, it should be noted that smallmouth bass may range up to one mile and that crayfish exhibit a scavenging behavior that may make it difficult to draw conclusions.	What is EPA's specific concern. The concern is that for most fish species, the distribution of tissue contamination may not reflect the distribution of sediment contamination (Eric).
211	7.1	7-2	2	Regarding the loading estimates, each section should explain the <u>uncertainty of the data obtained</u> or used; then, when the summaries and conclusions are presented, there should be a clear <u>statement of the uncertainty for that composite picture of data interpretation.</u>	

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219	7.1.2	7-9	2	The Round 3 sampling effort included a focused effort to characterize stormwater throughout the Portland Harbor site. This information should be used to refine the stormwater evaluation, including loading analyses. In addition the draft RI Report should describe the relationship of the stormwater data collected through the RI/FS and Source Control efforts.	Address through stormwater loading methods (Kristine).
240	4.2.1.4	D-25	2	Calculations of K_{oc} should not be estimated across the site based on the few selected TZW and sediment samples. Any data that are presented should be separated into actual datasets from samples and into calculated datasets. An estimate of the uncertainty associated with each dataset should be presented. Mixing field data with extrapolated data for a much larger area is not supported by the TZW dataset available for this site.	The LWG provided a clarification that observed Koc values were not used to estimate loadings. This comment seems to be addressed (Eric).
243	7.2.1 7.2.1.1.2.	D-40 plus 7-30 plus	2	Significant effort is spent in this appendix attempting to explain why arsenic, barium and manganese are found in high concentrations in TZW at all nine sites where this type of sampling was done. Rather than explaining the concentrations away as representing background conditions, the draft RI Report should concentrate on documenting where these are found, and should spend more effort attempting to develop a correlation between the uplands contamination and how those contaminants affect the concentration of these minerals. Note that even within the riverfront area of a site, the concentrations can vary considerably, most probably due to other factors which affect the dissolution of these minerals. The RI should concentrate on comparing the available data -- both in the upland sites and in the river – with these minerals. It should also attempt to compare the concentrations of these minerals with "non-contaminated" areas, even if the data available only allow that to be done within each single TZW sampling area. The data should present what is in the sediment, uplands groundwater plumes, and TZW, without bringing in interpretations of why that may be due to microbiological activity, or because the metal or mineral has unusual properties (As), or how it should be diluted from what was detected because of some assumed hydrological impact. Please present the actual data (with maps and graphs) without any of the additional interpretations or changes in the front of the RI, then any calculations and arguments in a separate section, but only if absolutely necessary. Much of the material presented in the Round 2 Report is a mixture of data and interpretations which may be considered biased, but which, in this presentation, are hard to separate from each other without a major effort.	LWG agrees to review nature and extent data in relationship with upland data. LWG questions ability to review data associated with "non-contaminated" areas and requests further direction from EPA. In addition, LWG disagrees that the RI should not look at geochemical factors, that the analysis is "potentially biased" and that "the occurrence and distribution of these metals is just a curious result that can be ignored." EPA agrees that a detailed geochemical evaluation is necessary to understand whether the observed arsenic, barium and manganese concentrations are the result of natural conditions or the presence of contamination or some combination. However, the lack of TZW data from unimpacted areas complicates this evaluation. EPA further agrees that this evaluation should consider literature based information regarding naturally induced dissolution of arsenic, barium and manganese (Rene/Eric).

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244	Figures	N/A	2	Many of the figures plot TZW vs. another contaminant (TPH, PAH, etc.). This may be a more worthwhile exercise if done for the plumes in the uplands, where something like PAH can be more easily detected in a reasonable concentration to make the case for interactions. Since the values in the TZW are rather dilute for any chemistry comparisons, it may be misleading to attempt such interpretations.	The LWG is unclear what figures this comment is referring to but sees little value in performing additional evalution. A comprehensive evaluation of TZW in conjunction with upland groundwater and in-water sediment contamination is required to understand the relative contributions of groundwater and sediment contamination to the observed TZW results (Rene/Eric).
245	Table D4-3		2	This table is a good start, but should be updated with all the more recent information on upland sites, including the correlations mentioned in other comments between sources and contaminant plumes and other factors (such as major ions, arsenic, manganese, iron, barium, etc., which are useful to understand the relationship of upland contamination to the river contamination).	The LWG is unclear what this comment refers to. EPA will provide clarification (Rene).
275	3.3.5.2	23	3	After "However, other species may also be consumed" add "For example, in a survey done by the Linnton Community Center, transients were asked about their consumption of fish or shellfish from the Willamette River. These transients reported consuming a large variety of fish, as well as crayfish and clams, and several transients said they ate whatever they could catch themselves or get from other fishers."	The LWG objects to the EPA requested language and will propose alternate language in the RI Report. EPA and the LWG have agreed that the Linnton Community Center questionnaire a "survey" (Dana).
295	4.6	44	2	A discussion of carcinogenic PAHs and their Relative Potency Factors should be added to this section. For the risk characterization of carcinogenic PAHs, the total risk from these compounds should be added and included as a separate line in the Risk Characterization tables. In addition the EPC tables should include a line that shows the total TEQs from the sum of the chlorinated dioxins/furans and dioxin-like PCB congeners. The Risk characterization tables should include the total risk from Dioxin-like PCB congeners and dioxin/furan congeners. These results may be important in determining if remedial goals are needed for protection of human health for carcinogenic PAHs and total TEQ.	The LWG states that further discussion is required to address PAH TEQ. EPA agrees that further discussion is required as part of the PRG discussion (Eric).
374	3.1.4	18	4	All lines of evidence should be used in determining areas of potential concern, not just the results of the toxicity test and the toxicity testing predictive model.	The LWG notes that further discussion is required. EPA agrees that further discussion is required as part of the PRG/AOPC discussion (Eric).
377	3.3	25	4	The Round 2 mussel tissue data should be included in the tissue residue assessment, for risks to mussels themselves as well as a dietary component of fish and wildlife risk evaluations. Compare mussel concentrations to acceptable tissue concentrations in prey for protection of fish and wildlife.	The LWG states that the Round 2 mussel data will be included as requested. No further discussion is required (Burt/Eric).

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378	3.3.1.1	26-7	4	The field-collected clam tissue should be used to determine iAOPCs – not the site-wide UCL screening. Areas that present risk to the benthic community on a location-specific basis should be identified.	The LWG notes that further discussion is required. EPA agrees that further discussion is required as part of the PRG/AOPC discussion (Eric).
379	3.3.1.6	29	2	The sediment data used here are not shown. The complete analysis of predictive tissue data should be available for review. LWG should develop predictive tissue concentrations based on BSAF relationships and using individual sediment points. Develop relationships for PCBs, DDTs, and dioxin and furans, and compare these to the food web model results. Calculate BSAFs on a PCB, DDTs, dioxin and furan congener-specific basis where data are available to do so, then back-calculate dioxin TEQs from the predicted individual congener tissue concentrations. For PCB samples without congener data, calculate BSAFs using total PCB and Aroclor data.	The LWG appears to agree with comment. EPA is in the process of finalizing comments on the BSAF approach. Further discussion may be equired as part of the PRG/AOPC discussion (Eric).
381	3.4.1	37	4	Surface water EPCs should not be represented by the UCL of the mean concentration for near-bottom SW samples collected from within the Study Area, because the Study Area is not representative of the spatial exposure scale of benthic invertebrates. Surface water risks should be estimated on a sample--by-sample basis for each available water sample.	The LWG states that point samples are not representative of benthic exposure. EPA disagrees with this contention. Many surface water samples were collected to characterize specific source areas. Because benthic organisms are immobile or have small home ranges, it is appropriate to perform a point by point evaluation of near bottom surface water (Burt/Eric).
393	3.6.1.2.1	52	4,5	Concentrations of total PAHs in field-collected clams exceeded the aquatic TRV (risk to clams themselves) of 1,000 ug/kg ww at four locations: downstream of ARCO (BT012), US Moorings (embayment (BT014), adjacent to GASCO (BT015), and downstream of Arkema (BT017). For PCBs and total DDTs, the concentrations measured in field-collected clams exceeded the respective TRVs at Willamette Cove and downstream of Arkema, respectively. As stated above, field-collected clams should be evaluated on a composite-by-composite basis. Other lines of evidence for evaluating the benthic community should also be assessed consistent with EPA's WOE approach presented in the attached problem formulation.	Further discussion regarding application of WOE framework and scale are required in the context of application of PRGs for AOPC identification (Burt/Eric).
394	3.6.1.2.2	53	4	The following Round 2 iCOCs for laboratory-exposed clams dropped out when the site-wide UCL was calculated (see also Table 3-38). Total PAHs: Downstream of ARCO (BT012). As stated above, laboratory-exposed clams should be evaluated on a composite-by-composite basis as an LOE in the BERA, with chemical concentrations in any individual samples exceeding a HQ of 1 retained as iCOCs.	Concern about sample by sample evaluation as opposed to 95% UCL approach. Need to recognize that clam data is based on composites and represents an average concentration over the area sampled. (Eric)

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396	3.6.1.2.4	59	4	Site-specific BSAFs should be used to predict tissue concentrations at chemistry locations on a sample-by-sample basis. This information should not be used to develop a site-wide UCL concentration. Location-specific predicted tissue concentrations should then be compared to TRVs to estimate risks. Table 3-40 should present the range of HQ values based on sample-by-sample analysis. EPA is in the process of preparing detailed comments on the BSAF development process presented in Appendix E.	Need EPA comments on BSAFs (Burt/Eric).
402	3.8	79	4	Risks to the benthic community should be evaluated using all benthic lines of evidence, not just the toxicity testing results and FPM predicted toxicity results. The weight of evidence approach outlined in EPA's BERA problem formulation should be applied to assess risks to the benthic community.	LWG requests further discussion regarding application of WOE. Further discussion regarding WOE and development of AOPCs is required (Burt/Eric).
403	Tables	3-4	5	While there may not have been enough samples to included in a sediment predictive model, the detection of these contaminants in sediment should screened against other sediment SQGs as part of the SLERA and evaluated as a line of evidence in the BERA.	The LWG has agreed to EPA's SLERA. Further discussion is required regarding the weight of evidence approach (Burt/Eric).
404	Tables	3-26	2	The dataset used for the analysis of background metal concentrations should be presented.	The LWG states that discussion of what data sets are to be included in the background data set is required. Our position is to eliminate data sets with outdated detection limits (Eric/Mike P.).
435	Tables	348-350	2	PAH HQs should be presented in Tables 4-47 through 4-51 for the evaluation of risk to sculpin, peamouth, juvenile Chinook, smallmouth bass, and northern pikeminnow.	LWG questions whether COPCs should be indentified on a receptor group basis. For example, if PAHs screen in for one fish species, should PAHs be identified as a COPC for all fish species (Burt).
443	5.2.1.2.1	146	2	Dioxin-like PCBs were analyzed for most beaches (13), and dioxins and furans were analyzed for 26 of the beach locations. Therefore, an exposure analysis to "TEQ" can be performed instead of using the co-located clam and worm data. The clam and worm data were collected in-river and not in the beach areas. PCB TEQ, dioxin TEQ and a total of dioxin-like PCBs and dioxins and furans should be evaluated using this data (not just PCB TEQ and dioxin TEQ presented separately). See Table 4-1 in the Round 2A Site Characterization Report dated July 17, 2005, for a complete list of analytes and detections.	LWG requests clarification It sounds like we want the LWG to evaluate TEQ based on PCB congener and dioxin and furan sediment analyses and not consider clam and worm data collected outside the exposure area (Burt).

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468	4.2	12	5	TPH, including diesel-range hydrocarbons, gasoline-range hydrocarbons, and residual-range hydrocarbons, were identified as COIs for benthic invertebrate receptors based on TZW data (Table 4-3). However, they were not evaluated in the Round 2 COPC screen because "LWG and EPA are currently discussing the TPH Eco SLs and TPH." Further discussion between EPA and LWG is required to determine how to assess TPH.	LWG states that further discussion is required and that resolution is dependent on the results of the alkylated PAH analysis. EPA agrees that further discussion of the predictive models is required (Burt/Eric).
477	3.0	8	2	A predicted tissue assessment should be presented for those contaminants analyzed in the food web model (PCBs, dioxins and furans, and DDTs). This will help verify the food web model, especially in localized areas. BSAFs developed in localized areas may outperform the model.	EPA's comment here is that PRGs should be developed based on the FWM and BSAFs. Address through PRG discussions (Eric).