Ports' Modeling Comment Summary and Responses
Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDLs

Table 1. Modeling Comment File

M1. Attachment 7 from Port of Los Angeles (letter from Ying Poon, Everest International Consultants)
M2. Table 3a. Appendix I Comments
M3. Table 3b. Appendix II Comments
M4. Table 3c. Appendix III Comments

Background information:

In response to the Ports' comments on the model developed for this TMDL, Staff note that while there is always more recent data and it is always possible to add to or improve a complex model, there is no compelling need to do so at this time; the model developed provides a reasonable and sufficient understanding of the functioning of the watersheds and Harbor waters and has generated meaningful allocations.

In 2004, when the TMDL development was introduced stakeholders, and as reiterated with stakeholders during TMDL development, the Regional Board and EPA staff established that the model development would be bounded as follows:

a. Model code would be publicly available; EFDC model was selected in part because code is publicly available;
b. Model development would occur along with TMDL development under a limited (EPA) budget; therefore continual model revision was both cost prohibitive and unlikely;
c. Model development would rely on available monitoring data and information up to and including sediment characterization results collected in 2006; i.e., that was the data cut-off date;
d. Once final, EFDC model output would also be publicly available to interested parties (to facilitate future model refinements by interested parties);
e. Further model refinement would be feasible after TMDL adoption and approval.

As documented on the Regional Board website, numerous meetings/teleconference calls have been held from 2004-2010 to share information on technical approach, to solicit input on data needs relevant to LSPC and EFDC model development, and to provide feedback on draft model results. Tetra Tech, EPA's model contractor, gave multiple detailed presentations on EFDC and LSPC model development to 'Technical Advisory Committee' (TAC) members. Representatives of Ports of Los Angeles and Long Beach (and their contractors) have participated in (and hosted) TAC meetings during this timeframe.

As designed from the start, TAC members have reviewed and commented on drafts of hydrodynamic and water/sediment quality model reports

(Tetra Tech May 2008; May 2009; February 2010). These drafts, the Ports' comments on these previous drafts, as well as the responses from the Regional Board and EPA (and Tetra Tech) are posted on the Regional Board website.

In addition, the model development included the Dominguez Channel Estuary Model Study results by the Port of Los Angeles (and their model contractor Everest International), which was conducted under a SWRCB Proposition 13 grant to the Port of Los Angeles. Staff note the Port of Los Angeles has been using EFDC model and all the model data to support the Ports' Water Resources Action Plan (WRAP, 2010), which they continue to use for further model refinement (as anticipated in the initial model plan) and during TMDL implementation.

With this information in mind, we provide additional responses to comments, specifically on the LSPC or EFDC model, provided by Port of Los Angeles and Port of Long Beach and Everest International.

Table 2. Comments and Responses

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M1	Attachment 7 from Port of Los Angeles (letter from Ying Poon, Everest International Consultants)		
M1.1		A fundamental problem of the Draft Harbor TMDL is that the sediment deposition rates used for TMDL development are order of magnitude too small when compared with known sediment deposition rates at the Los Angeles River Estuary (LARE) and San Pedro Bay from prior U.S. Army Corps of Engineers (USACE) studies. By underestimating the deposition rate, the Draft TMDL has under-estimated the loading capacity of the greater harbor waters.	See response to **Comment M4.1** below.
M1.2		In addition, the numeric targets used for the TMDL were arbitrarily chosen and are believed to have also underestimated the loading capacity of the greater harbor waters. Underestimating the loading capacity of the greater harbor waters in turn results in setting TMDL allocations that are likely to be an order of magnitude lower than what the water body can actually assimilate and still achieve beneficial uses.	See response to **Comment 20.3** in the public comments response document.
M1.3		The use of only two model scenarios is not sufficient to link multiple pollutants sources to multiple water bodies. The linkage analyses are not sufficient to determine which specific watershed sources were contributing to deposition in each water body. This in turn leads to	A limited number of scenarios were completed to determine allocations. This is a reasonable decision based on limited budget and requirement to complete TMDLs within the consent decree deadline. Modeling scenarios are common

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		WLAs for individual MS4 permittees not being allocated to the appropriate sources. For some water bodies, allocations were not made to all the appropriate pollutant sources. For example, the Consolidated Slip receives pollutant loadings from the Consolidated Slip Watershed, as well as the Dominguez Channel Watershed and the Dominguez Channel sediment bed. However, the MS4 allocations for the Consolidated Slip were made to MS4 permittees only within the Consolidated Slip Watershed (Appendix III.1 Pg III-5).	and well-documented strategies for determining allocations in complex systems. Watershed sources were identified and quantified based on their associated land use. Allocations were provided for the various MS4 dischargers, associated with point source stormwater contributions. Allocations are required for the various permittees, but are not required as part of a TMDL for individual, specific sources. This approach provides flexibility for the dischargers on implementation activities to achieve their allocations.
M1.4		The linkage analyses were also not sufficient to support LAs made for air deposition which assumes that all of the contaminants from air deposition in each waterbody deposits in the sediment bed of the same waterbody.	See response to **20.4** in the public comments response document.
M1.5		In addition, no site specific linkage analysis was conducted to link fish tissue concentrations and sediment contaminant concentrations that were used to determine the PCBs numeric target and TMDL.	See response to **20.3** in the public comments response document.
M1.6		The Draft TMDL WRONGLY substitutes the percent contribution of sediment loading with the percent dilution of contaminant concentration in the top 5 cm of sediment bed over a four year period. The two numbers are not correlated and cannot be used interchangeably. Hence, the methodology used to derive the Draft TMDL WLAs fundamentally flawed and the resulting WLAs are completely arbitrary.	The percent difference between the two modeling scenarios quantifies the difference in loading between existing conditions (with current watershed loads) and clean sediment from the watersheds (i.e., assuming implementation of the TMDLs). The relative difference between these loads estimates the contribution from the watersheds for WLAs, which is a sound method given the limited time and budget to complete the TMDLs within the consent decree deadline. While dilution does occur with the inclusion of clean sediment, the model simulations (after a four-year period and based on the average concentration in the top 5 cm) consider the initial concentrations, amount of sediment deposited, and the incoming concentrations when determining the average values.

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M1.7		Furthermore, as shown in Appendix III.8 Table 2 of the Draft TMDL, the methodology used to determine percent watershed contribution in some cases, results in negative percent watershed contribution which is physically impossible. Hence, the methodology used to derive the percent watershed contribution and subsequent Draft TMDL WLAs is fundamentally flawed resulting in WLAs that are completely arbitrary.	See response to **20.2** in the public comments response document.
M1.8		LAs for bed sediments were determined as the remaining amount after all other allocations. The incomplete and inaccurate linkage analysis conducted for this TMDL resulted in negative allocations for bed sediments, contradicting the definition of an allocation. This illustrates the fact that the bed sediment allocations are calculated based on faulty linkage analysis; hence resulted in physically meaningless negative allocations.	In greater Harbor waters, monitoring results collected by PORTs and SCCWRP show pollutants are diffusing from bed sediments, therefore it is appropriate to define allocations to these sources.
M1.9		The TMDL development assumes that over time the required maximum contaminant sediment concentration (sediment target) can be achieved if the depositing sediment has a contaminant sediment concentration at or below a maximum contaminant sediment concentration which is deemed suitable to protect aquatic life, human health, and beneficial uses. Over time, existing contaminated sediments would be buried below the active sediment layer. Simple burial by clean sediment does not account for other assimilative mechanisms in the water body, such as dissolution of contaminants from the particulate phase into the water column and tidal flushing. Therefore this approach underestimates the assimilative capacity (and thus the loading capacity) of the water body.	The sediment concentrations simulated by the receiving water model account for burial as well as other processes, such as pore water diffusion (between the sediment bed surface layer, the overlying water, and the bed layer just below the surface layer) and tidal impacts. Therefore, these processes have been accounted for in the existing conditions calculations (which were then used to determine percent reductions from the numeric targets).
M1.10		Even though EFDC is a suitable numerical model to simulate watershed loadings, sediment deposition, sediment re-suspension, and transport conditions of the greater harbor waters, the model developed for the Draft TMDL was not calibrated for sediment transport nor sediment deposition. In addition, the EFDC model was not calibrated for wet weather conditions during which most sediment transport and sediment redistribution within the harbor is expected to occur. This lack of	The EFDC model was configured and calibrated/ validated using the best available data at the time of modeling. Based on the limited amount of data, the existing calibration and validation are sufficient for TMDL calculations. In addition, the simulated values used for TMDL or existing loading rate calculations were annual averages. Given that the model is in the range of observed values and averages are likely

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		calibration and validation of the sediment transport model means that the sedimentation rate used to establish the TMDLs and allocations in Table 6-10 and Table 6-12 is highly questionable; resulting in TMDLs and allocations that may not be realistic.	similar, the model is being appropriately used to determine loading estimates.
M1.11		Based on the annual depositional thickness, it is likely that the sediment contaminant concentrations used to determine the existing contaminant loadings is attributed to the initial contaminant bed concentrations used in the EFDC Model rather than the results of depositing contaminants over the four-year simulation period. The estimate of current loads (presented in Tables 4-6, 6-10, and 6-12) are used to estimate the overall percent reduction required to meet the TMDL and does not reflect the percent reduction required if the existing loads were estimated from sediment concentrations based on 17-year, 30-year, or 530-year simulations (time estimated to reflect deposition of the top 5 cm shown in Table 1) for various water bodies.	The existing contaminant concentrations are based on average values from the receiving water model, which considers the initial concentrations, amount of sediment deposited, and the incoming concentrations. Since these were average concentrations applied to average annual deposition rates, they are considered representative of annual conditions (regardless of the number of years used in the simulation).
M1.12		The linkage analyses presented in the Draft TMDL are incomplete or inaccurate or fail to support assumptions made in the TMDL development.	See response to **Comment 20.3** in the public comments response document.
M1.13		Assignment of LAs to existing bed sediments is not consistent with other toxic sediment TMDLs developed for other California regions including San Francisco Bay and Marina del Rey.	In greater Harbor waters, monitoring results collected by PORTs and SCCWRP show pollutants are diffusing from bed sediments, therefore it is appropriate to define allocations to these sources.
M1.14		TMDLs and allocations were made for several water body-pollutant combinations that were not required based on the assessment findings (Draft Staff Report Table 2-18) or 2008/2010 303(d) list (Draft Staff Report Table 2-7).	See Response to Comment **20.1**
M1.15		The PCBs TMDL and allocations provided in the Draft TMDL Report Table 6-12 were calculated based on a numeric target of 3.2 ug/kg stated	PCBs sediment target is 3.2 ug/kg dry weight. Justification has been added to TMDL and BPA.

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		in Appendix III.1 Page III-4. This PCBs numeric target is different from either the ERL (34 ug/kg) or the fish tissue numeric target (3.6 ug/kg) discussed in other parts of the Draft TMDL report. There is no justification on how the numeric target of 3.2 ug/kg was selected.	
M2	Table 3a. Appendix I Comments		
M2.1	3	The text states "The EFDC model had previously been applied to simulate sediment and metals transport in the tidal region of Dominguez Channel (Everest, 2006). The model grid used in the Dominguez study was adopted for this study. Field observations collected during that study were also used for model calibration and validation in this current effort." The DCEM Study collected water elevation, current, salinity, dye, and other water quality data for both dry and wet weather conditions. Only the dry weather water surface elevations and velocities were used for the EFDC model calibration. Please re-word the statement.	Document has been revised to verify the data used. Wet weather data provided (for 2006) were not used as they fell outside of the study period (2002-2005).
M2.2	3	The first paragraph of Section 3 states "Calibration data includes observations of hydrodynamic variables predicted by the modeling including water surface elevation, horizontal currents, salinity, temperature, and dye tracer concentration." Temperature and dye tracer concentrations were provided from the Port of Los Angeles Prop 13 study of the Dominguez Channel Estuary but these data were not used for the model calibration. Please revised sentence: "Calibration data includes observations of hydrodynamic variables including water surface elevations, horizontal currents, and salinity."	Document has been revised.
M2.3	3	The last sentence of the 2nd paragraph states "The available data being used for calibration are limited to two tide gauges, four current meters within the breakwater, six current meters outside the breakwater in San Pedro Bay, and approximately 120 salinity and temperature monitoring stations." The model was calibrated with water surface elevations from the NOAA tide gage and four inner harbor current meters, as discussed	Document has been revised.

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		in Section 5.1. Please revise the sentence to state five tide gauges were used.	
M2.4	4	Wind data from the seven NOAA PORTS observational sites were also used as discussed in Section 4.6 but not shown in Table 1. Please add these data to Table 1.	Document has been revised. The NOAA PORTS wind field were used for the portion of the simulation period for which they were available, October 2004 through April 2005.
M2.5	5	The first paragraph describes the available salinity data and the rationale for using only a portion of the data for model calibration, which was limited to 20 stations showing significant depressions in salinity. However, as noted in Table 1, dry and wet weather salinity data were available as part of the "Port of Los Angeles Prop 13 Salinity, Temperature and Dye Data", but these data were not used for model calibration. Please add a discussion on why these data were not used for model calibration (or validation).	Wet weather data provided (for 2006) were not used as they fell outside of the study period (2002-2005). In addition, the data from the study mentioned by the reviewers were focused on the Dominguez Channel region. Since the MTDL model used the previous Dominguez Channel model upstream of the Consolidated Slip, there was little need to repeat the comparison.
M2.6	5	The second paragraph states that Table 2 contains the data used for sediment transport and contaminant fate. The Port of Los Angeles Prop 13 study data mentioned in the prior comment (and shown in Table 1) also included sediment and metal data for both dry and wet weather conditions. These data were not used for this model calibration. Please add a discussion regarding the availability of the sediment and metals data and the why these data were not used for model calibration.	Wet weather data provided (for 2006) were not used as they fell outside of the study period (2002-2005). In addition, the data from the study mentioned by the reviewers were focused on the Dominguez Channel region. Since the MTDL model used the previous Dominguez Channel model upstream of the Consolidated Slip, there was little need to repeat the comparison.
M2.7	5	It is stated that two grid resolutions were used – course resolution other the breakwater and finer resolution in the harbor. Please add the approximate grid size for the two different resolutions.	Document has been revised to describe how the resolutions varied.
M2.8	10	This section describes the temperature open boundary conditions. However, temperature was not simulated as stated in Section 6. Please remove references to the temperature open boundary conditions.	Document has been revised.
M2.9	7	The model grid does not have an apparent representation of the San	The San Gabriel River watershed flow and loadings are

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		Gabriel River. Please discuss how the San Gabriel River Watershed loadings were specified in the EFDC model, as well as why the San Gabriel River is not included in the model grid.	included in the modeling. They are introduced into the model grid at the approximate location where it enters San Pedro Bay, near Alamitos Bay.
M2.10	8	The model grid in the vicinity of Cabrillo Marina represents the West and East Channels in the Port of Los Angeles. These two channels are separate "basins." The West Channel contains Cabrillo Marina and Watchorn Basin. The Cabrillo Marina waterbody is shown in the Draft Staff Report Figure 2-1. However, the model grid cells of this area show that the two channels are hydraulically connected resulting in an island. Simulations with this model grid could result in erroneous results, primarily for Cabrillo Marina. Model grid cells connecting the West and East Channels should be removed and modeling results for Cabrillo Marina should be redone.	The visually apparent hydraulic connection is eliminated in the model using the thin mask option in EFDC. See mask.inp in EFDC users manual.
M2.11	10	We agree with the statement that "Hourly observed flows (provided by the Los Angeles County) were preferentially used during periods when they were available." As shown in Appendix I Supporting Note No. 1 in Attachment 10, the measured flow at times can be higher than the modeled flow by a factor of 2. However, since the pollutant loadings are proportional to the flow, were there any adjustment be made to the watershed model predicted pollutant concentrations before applying to the EFDC model when measured flow instead of watershed model flows? If not, the actual pollutant loadings to the harbor would be different from the watershed predicted loadings.	The watershed model-predicted concentrations remained unchanged and were multiplied by the hourly observed flows (when available) or hourly modeled flows (when observed data were unavailable) to determine the watershed loadings to the EFDC model. When the observed flows were higher than the modeled flows, the associated loadings would be higher by the same factor.
M2.12	11	Please provide a location map identifying all freshwater inflows including the Los Angeles River, San Gabriel River, Dominguez Channel, Nearshore, and Terminal Island Treatment Plant (TITP). This would be helpful for evaluating the salinity calibration, especially since the TITP discharge is in the vicinity of the salinity data locations. In addition, please show time series plots of river and wastewater flow	Figure in document has not been updated. This is a reasonable decision based on limited budget and requirement to complete TMDLs within deadline. TMDL models are based on publically available code. Once the TMDL is approved then EFDC and LSPC model

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		rates used for model calibration period.	output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction.
M2.13	11	Daily inflows were used for the Nearshore Watershed inflows, while hourly inputs were used for the Los Angeles River, San Gabriel River, and Dominguez Channel Watersheds. Rain characteristics in the Los Angeles Region are typically of short duration and we have demonstrated in past comments that the use of daily output from the Los Angeles River Watershed substantially underestimates the peak flows from the Los Angeles River. Because of our past comments, earlier EFDC Model using daily watershed input had been modified to using hourly input. Since the Nearshore Watershed is relatively small and highly impermeable compared to the LAR, SGR and DC watersheds, flows for a given rain event would be shorter in duration than these other larger watersheds so it's even more critical to use hourly, not daily, inputs. Please provide justification why daily inputs are still being used for the Nearshore Watershed. Using the rain event that was used for calibrating the Nearshore Watershed Model as an example, the Appendix I Supporting Note No. 2 in Attachment 10 illustrates that the use of daily input could have resulted in the EFDC Model either 1) completely missed the rain event (zero flows to the harbor), or 2) sees order-of-magnitude higher flows to the harbor than the actual rain event supposed to generate.	Daily inputs for the nearshore watershed were used rather than hourly inputs to minimize model run time. Hourly inputs were included for the three large watersheds (LAR, SGR, DC). There were 67 nearshore subwatersheds; therefore including hourly watershed loadings would significantly increase the computation time to prohibitive levels (i.e., computation time to perform a single model run could be on the order of weeks). In addition, the overall loading associated with the nearshore watersheds is significantly smaller than the larger watersheds.
M2.14	11	Section 4.7 indicates that flows the Terminal Island Treatment Plant (TITP) was included in the model, but associated pollutant loading were not simulated. In addition, other NPDES discharges were not simulated in the Receiving Water Model, thus pollutant loadings from NPDES discharges were not simulated. In the harbor area, there are three major NPDES discharges – TITP, Harbor Generating Station, and Long Beach Generating Station. Within the San Gabriel River Estuary, there are two major NPDES discharges –	Yes, TIWRP flows were included in EFDC model, unfortunately pollutant concentrations were not. This oversight was due to timing and budgetary issues. The TIWRP permit was recently revised and contains useful information regarding current performance and average pollutant discharges. Model did not include flow nor pollutant information from the various power generating stations in the subject waters.

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		Haynes Generating Station and Alamitos Generating Station. As shown in Appendix I Supporting Note No. 3 in Attachment 10, NPDES discharge can contribute a significant amount of pollutants because of their large flow volumes, hence, should be included in the EFDC model.	We considered this information to be desirable but not critical since copper is the sole pollutant in generating station discharge. Also, it is reasonable to assume the Harbor Generating Station and Long Beach Generating Station are more critical since they discharge directly into subject waters. The other two generating stations are within San Gabriel Estuary and subject to San Gabriel River metals TMDLs.
M2.15	12	The model and field data comparisons for water surface elevations at Pacific Avenue located in the Dominguez Channel showed large errors (Table 7). The explanation given was "due to a large number of default entries in the data records." However, the same data were used for calibration of the Dominguez Channel Estuary Model (DCEM), which showed a near perfect match between the DCEM and field data. This suggests that the EFDC Model has not been properly calibrated.	The DCEM was run for a much shorter time period than the TMDL model. A more narrow focus and time period made calibration to field data much easier for the DCEM, especially using qualitative visual comparison. See also response to **Comment M1.10** above.
M2.16	15	Water surface elevation comparison at Berth 200G located in the Consolidated Slip (Figure 6) shows that there is a large discrepancy between the observed and predicted low tide water surface elevations of approximately 0.5 m (1.6 ft), indicating that the model is showing substantial tidal muting at this location. However, the observed tides indicate there should not be any tidal muting at this location. In addition, the DCEM model calibration showed a near perfect match between the observed and model-predicted water surface elevations at this location (Everest 2006). This suggests that the EFDC Model has not been properly calibrated.	See response to **Comment M2.15** above.
M2.17	16	The EFDC current calibration was based only on four locations (all confined to areas in the vicinity of the Dominguez Channel Estuary). Given the spatial expanse of the great harbor and the importance of the understanding of currents in contaminant fate, additional data provided by the Ports for four other locations (two in the LA Harbor and two in the LB Harbor) for the period between December 2009 and April 2010	See response to **Comment M1.10** above. TMDL and model development were completed to meet consent decree deadline; therefore a 'data cut-off' was established as well as 'no further' model revisions date. Commenter has provided information after cut-off date and after 'no further model revisions' date. Such information may be considered

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		should also be used for model calibration.	as part of future TMDL update or model update; i.e., in preparation for the TMDL re-opener.
M2.18	17	The 1st paragraph on Page 17 states "The strong agreement between model predicted currents at the Pacific Avenue station tends to support the conclusion that water surface elevation observations at this station are compromised." The observed water surface elevation and velocity data used for the model calibration was provided from the Dominguez Channel Estuary Model DCEM Study (Everest 2006). The DCEM Study showed strong agreements between modeled and observed water surface elevations and velocities at the Pacific Ave station, suggesting that the observations at this station are not compromised.	See response to **Comment M2.15** above.
M2.19	28	The last sentence states "Figure 16 shows the location of 200 data sites having bed sediment size information, while Figure 16 shows a zoom of the most recent subset of these data." The second Figure 16 should Figure 17.	Document has been revised.
M2.20	29	Discrepancies of the model sediment bed thickness were found between Appendix I, Appendix III.8, and the Draft Staff Report. In Appendix I, the first paragraph of Page 29, indicates that the model was configured to have 4 layers, each 20 cm thick. However, in Appendix III.8 Page 2 it is indicated that the top 20 cm corresponds to the top two bed layers (i.e., each bed layer is 10 cm). Please clarify the discrepancy in these documents. In addition, the Draft TMDL Report model results from the linkage analysis were based on the top 5 cm of the bed. Please explain how the bed results of the top 5 cm were determined if the model was configured with either 10 cm or 20 cm top bed layer.	Document has been revised.
M2.21	29	The last sentence on Page 29 indicates that the log of the pollutant-	Final sediment quality guidelines used in the TMDLs were

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		specific sediment quality guidelines is identified in Figures 23 – 28. However, the sediment quality guidelines shown in these figures are different from the sediment quality guidelines provided in the Draft Staff Report Table 2-4, which are used for determination of impairments. Please clarify.	determined after the modeling was complete, resulting in different values for these comparisons.
M2.22	55	Figure 38 shows the comparisons of the Los Angeles River flows with the corresponding sediment and copper concentrations. Overall, the sediment and copper peak concentrations coincide with higher flows (i.e., wet weather). However, during lower flow conditions (i.e., dry weather) high concentrations are also shown such as peak concentrations around days 183 and 913. Please explain the higher concentrations during dry weather conditions.	The flows shown in these figures are based on the observed values, while the concentrations are based on model output. Given that the sources were different, it is not surprising that the results are not entirely consistent.
M2.23	55	For DDT and PCB, the method utilized to determine the watershed loadings is based on the assumption that the pollutant concentration from the watershed during wet weather is similar to the pollutant concentration in the harbor bottom sediments. This assumption is likely to over predict the watershed pollutant loading because the pollutants in the bottom sediments are likely to be more concentrated than in the water column. In addition, the pollutants in the bottom sediments are likely to be coming from multiple locations throughout the harbor but have become concentrated in areas that undergo increased sedimentation. In general, for a complex water body like the LA/LB Harbor complex, it is difficult to identify meaningful direct “cause and effect” correlations between the receiving water pollutant concentrations and pollutant loadings from the immediate adjacent nearshore subwatersheds. For example, the pollutant sediment concentrations at the Bight 03 East Basin Station are more likely associated with pollutants from the DC Watershed rather than the seven, small nearshore subwatersheds located nearby.	See response to **Comment 19.6** and **Comment 23.6b** in the public comments response document.
M2.24	56	The wet and dry weather daily loadings for the four major watersheds are provided in Table 23. The text in Page 55 states that the loadings	The LAR loadings in Table 23 are based on a composite of modeled (concentrations) and observed (flows) values. The

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		were based on the watershed model output, but in Section 4.7 it is indicated that flows for the Los Angeles River were based on a combination of observed and modeled flows. Hence, are the loadings for the Los Angeles River Watershed presented in Table 23 calculated based on the modeled flows or a composite of both modeled and observed flows? Please clarify the flow and concentrations used to calculate these loadings for both wet and dry weather conditions.	text has been clarified.
M2.25	56	The text states that the Consolidated Slip is adjacent to only one nearshore subwatershed. However, there are two subwatersheds on either side of the Consolidated Slip (subwatersheds 38 and 39). Please revise the text to indicate that there are two subwatersheds draining into Consolidated Slip.	Document has been revised.
M2.26	57	Table 24 presents the Nearshore Watershed loading in terms of daily average loadings. Please provide corresponding wet and dry weather loadings as well as the definition of wet weather conditions.	TMDL models are based on publically available code. Once the TMDL is approved then EFDC and LSPC model output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction.
M2.27	57	The Fish Harbor is designated as a separate waterbody for TMDLs and separate loadings are provided in Table 24. However, Figure 39 does not show the corresponding subwatershed area for the Fish Harbor, it is not clear how the watershed loadings for the Fish Harbor (shown in Table 24) were determined. Please revise the figure to include the subwatershed(s) draining into the Fish Harbor. Figure 39 shows a gray colored subwatershed west of Cabrillo Beach, which according to the figure legend corresponds, to the San Pedro Bay Near/Off Shore Zone. Please explain why this subwatershed is considered to be draining into San Pedro Bay? Please also explain why the model cells outside the harbor, along the entire length of the breakwater is considered to be part of San Pedro Bay.	As shown in the legend of Figure 39, the watershed areas with an overlay of diamonds drain to more than one waterbody. This is the case for Fish Harbor, which receives loading from the adjacent subwatershed that also drains to the Inner Harbor (hence, the yellow shading). The grey colored subwatershed west of Cabrillo Beach is not included in the nearshore drainage area and does not contribute loading to San Pedro Bay. The model cells outside of the harbor are considered to be part of San Pedro Bay based on the waterbody coverage associated with the 303d listed waterbodies provided by the State Water Resources Control Board. Figure in document has not been updated. This is a reasonable decision based on limited budget and requirement to complete TMDLs within

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			deadline.
M2.28	61	The dry weather sensitivity analysis was conducted based on water column concentrations. However, the TMDLs were developed based on sediment concentrations. Please provide results based on the sediment concentrations.	TMDL models are based on publically available code. Once the TMDL is approved then EFDC and LSPC model output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction.
M2.29-1	63	The text in Section 8.1 indicates that Figure 40 shows model predictions at a representative site. The TSS time series shows fluctuations in the water column sediment concentration, but the fluctuations are not tidal since oscillations are over a one-month period and do not appear to correspond to wet and dry weather conditions (generally high concentrations during wet months and lower during dry months). These results are the only time series results provided for the model calibration. The unknown fluctuations raise concerns regarding the model calibration and the methodology to use a six-month average to compare with observed data. Please provide a description in the text to explain these unusual fluctuations, as well as to how this site is representative of other calibration sites. Also, please provide a map indicating the location for the comparison and the data source for the observation. In addition, the figure indicates that the results are for April to October 2006, but the model calibration was based on results for May to October 2005. Please revise the text in the figure accordingly.	In Figure 40, the early transient is due to suspended sediment remaining in the system after the high flows in Jan through March 2005. This has been described in the report. The reviewer should also recognize that these variations are between 4 and 8 mg/L. Prediction of suspended sediment concentration to within a factor of 2 is considered good. Dry season model predictions from 2005 were compared with dry season observations from 2006. These comparisons were previously discussed in stakeholder meetings and conference calls during model development.
M2.29-2	64	TSS and metal results were presented as scatter plots of the observed and predicted concentrations (Figures 41 – 44). However, the TSS scatter plot for the overlying 2006 sites (top panel in Figure 41) does not show the full range of data. The TSS field data shown in Figure 37 shows TSS ranging from 0 – 50 mg/L, but Figure 41 shows only TSS data up to 20 mg/L. Please revise the figure to show model comparison with the full range of field data.	Document has been revised for clarification. These figures compare model predicted dry season averages for 2005 with point in time averages for 2006. The higher data in 2006 was not considered representative and likely associated with navigational activities.
M2.30	C-1	The opening sentence indicated that the dry weather sensitivity analysis	Document has been revised to include the correct date

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		was conducted for the period May to October 2009. However, Appendix I Section 8.3 indicates the dry weather sensitivity was conducted for May to October 2005. Please provide a summary of the watershed inputs used for the dry weather sensitivity analysis (Appendix C). If this is a typo, please revise accordingly.	(2005). TMDL models are based on publically available code. Once the TMDL is approved then EFDC and LSPC model output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction.
M2.31	D-5	Time series results (Figures D-3 to D-8) are provided for both the baseline and load reduction simulations at three harbor locations. Several concerns were identified based on these figures; please provide explanations for these concerns. 1. At Station 42 (Figures D-4 and D-7), water column concentrations do not follow the same patterns as the other two locations. The water column concentrations do not follow wet weather conditions; instead, the water column concentrations show a more gradual increase and decrease over an entire year. For example, the copper concentration increases beginning at the start of the 2004-05 wet season (October 2004), peaks around April 2005, and returns to dry weather conditions in October 2005. Similar pattern occurred for each of the simulation years. 2. Copper sediment concentrations behave differently from the zinc sediment concentrations at Station 42. Figure D-7 shows that the zinc concentration in the sediment bed increases with the higher water column concentrations for 2005, indicating continuous sediment deposition at the site. However, the copper concentrations at the sediment bed surface at the same site remains unchanged over the same period. 3. Model results showed increases in copper and zinc concentrations in response to wet weather conditions. However, wet weather concentration took months to return back to dry weather conditions. This is illustrated for results at Station 8 (Figures D-3 and D-6) and 54 (Figures D-5 and D-8). 4. Bed copper and zinc concentrations at Station 8 and 54 show	TMDL models are based on publically available code. Once the TMDL is approved then EFDC and LSPC model output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction.

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		continuous increases in concentration with each wet weather event. This indicates that if the simulation were to be continued, the sediment bed concentration would keep increasing. Hence, the simulation time frame seems arbitrary.	
M2.32	D-16	Figure D-14 shows the relative reduction in sediment zinc level between the EFDC model results with full and half watershed loads. As shown in the figure, this relative difference for the Los Angeles River Estuary was in general greater than 80% (0.8 in the figure). However, Appendix III.8 Table 4 shows the relative reduction for zinc at LARE for simulations with full load and no load is about 88%. Please explain why reducing the watershed by 50% (half load) would produce similar results as the no watershed load simulation.	TMDL models are based on publically available code. Once the TMDL is approved then EFDC and LSPC model output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction.
M2.33	D-18	In general, the four year long-term simulation results indicate that the water column concentrations for copper, zinc, DDT and PAH correlates fairly well with the Los Angeles River flow data, i.e. there is high water column concentration when there is high LAR flow and the water column concentration drops to very small value after the passing of a wet flow event. For metals, the corresponding concentrations at the bed surface generally increase continuously throughout the four-year simulation, indicating the settling of the sediment in the water column onto the bed surface after the wet flow event. However, the DDT and PAH bed concentration do not follow the same trend and show a continuous decrease in concentration that levels out towards the end of the simulation period. For example, the DDT concentration at the bed at Station 8, shown in Figure D-15, continuously decreases over time. This decrease was explained in Page D-17 as due to the pore water and water column concentration coming into equilibrium. If this is the case, the model initial conditions should be revised to allow the model to come into equilibrium before using the model.	Model initial conditions were based on observed sediment concentration data and should not be "revised" as the comment suggests. And a longer simulation period would have made the model run time prohibitive to complete the TMDLs within the required budget and consent decree deadline.
M3	Table 3b. Appendix II Comments		
M3.1	1	EPA guidelines (2000) state "If the State cites documents as the basis for	The LSPC models for the LAR and SGR are described in

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		technical findings in the TMDL which are not submitted with the TMDL package, the TMDL document must clearly summarize the technical analysis supporting the findings concerning individual TMDL elements." However, modeling of the Dominguez Channel (DC) Watershed conducted by Southern California Coastal Water Research Project (SCCWRP) is only referenced as unpublished results by SCCWRP. Loadings from DC Watershed are critical for the TMDL development and allocations. Need to provide summary of the technical analysis conducted for the Dominguez Channel Watershed such that the assumptions, calibrations, and model-predicted loadings for the DC Watershed can be reviewed as required by the EPA guideline.	Tetra Tech, Inc., 2004 and 2005a (available on the Regional Board website for their applicable TMDL), while the HSPF model for the DC watershed is documented in SCCWRP, unpublished results (SCCWRP can be contacted regarding the availability of these unpublished results). These documents are cited in Appendix II. TMDLs have already been developed in the LAR and SGR watersheds; therefore, all associated documentation, including model reports discussing implementation and calibration, have undergone peer review. The DC modeling efforts, similar to LAR and SGR, utilize the regional modeling approach, which is also described in the technical documentation for the Ballona Creek metals and Santa Monica Bay Beaches bacteria TMDLs.
M3.2	5	For the Nearshore Watershed Model, it was assumed that Machado Lake was not hydrologically connected to the Harbors except during extremely large and rare meteorological events. However, no loadings from Machado Lake were determined. In Appendix III.8, it is stated that "the 2005 water year ranked in the 97th percentile of annual rainfall levels dating back to 1944." The 2005 water year could be considered to have had "extremely large and rare meteorological events." In addition, it is stated in Section 4.4 of the staff report that ". . . intermittent flow from Machado Lake are also potential sources of metals, pesticides, PCBs, and PAHs to Harbors." In addition, based on Port of Los Angeles monitoring data, Machado Lake watershed contributes more flow into the Harbor than many of the smaller nearshore watersheds. Hence, flows and loadings from Machado Lake need to be quantified and included in the Nearshore Watershed Model (see Attachment 6).	Technical analyses were performed to identify Machado Lake as a sink in the system during most conditions and a discussion of these analyses will be added to Section 3.1.1. It is anticipated that monitoring to confirm this assumption will be conducted in the future. If such information on overflows and sediment loading from Machado Lake are performed or identified in the future and suggest that Machado Lake should be included, revisions can be made to the LSPC model if the TMDL is reopened for that purpose in the future. In addition, a TMDL for Machado Lake Toxics has been adopted by the Regional Board (and City of Los Angeles Proposition O funds are dedicated for necessary remediation), so this potential source will become diminishing in the future.
M3.3	19	The discrepancies in modeled TSS vs. observed TSS are not within "acceptable modeling ranges" as stated in the first paragraph of Pg 19. Figure 7 shows that after the peak, the averaged model TSS is about 650 mg/L while the averaged measured TSS is only about 40 mg/L. The	See response to **Comment 19.6** in the public comments response document.

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		model over-predicted TSS by a factor of 16. This means that the model could have over-predicted loadings by more than an order of magnitude. Further calibration of the model is needed.	
M3.4	20	Figure 8 again shows that the model has over-predicted TSS at another location by an order of magnitude. Further evidence that the model has not been probably calibrated.	See response to **Comment 19.6** in the public comments response document.
M3.5	23,25	Test in page 23 states that "the predicted loads are fairly close to the observed POLA/POLB stormwater data. These model results are within acceptable modeling ranges". However, based on the results shown in Figure 11, the modeled copper, lead and zinc loadings are 84, 73 and 730 g; while the measured copper, lead and zinc loadings are 23, 15, and 180 g, respectively. This means that the model over-predicted the metal loadings by a factor of 3.6 to 4.9 times. Need to justify how this can be considered as "within acceptable modeling ranges".	See response to **Comment 19.6** in the public comments response document.
M3.6	28	Metals model results are compared to stormwater data at monitoring stations in the Port of Long Beach in Appendix A (Figures A-16 to A-27). In the text, it is stated that "the model appears to reproduce the magnitude of observed data reasonably well." However, Figures in Appendix A show that the modeled metal concentrations are in many cases order-of-magnitude lower than the measured field data. Normally, the wet weather concentrations should be higher than the dry weather concentration. However, most of the modeled wet weather metal concentrations show the contrary; i.e. they are about the same or less than the dry weather metal concentrations estimated based on stormwater data in the Los Angeles River and San Gabriel River Watersheds shown in Table 13.	See response to **Comment 19.6** in the public comments response document.
M3.7	40	For DDT, chlordane and PCB, the method utilized to determine the watershed loadings is based on the assumption that the pollutant concentration from the watershed during wet weather is similar to the pollutant concentration in the harbor bottom sediments. This assumption	See response to **Comment 19.6** and **Comment 23.6b** in the public comments response document.

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		is likely to over predict the watershed pollutant loading because the pollutants in the bottom sediments are likely to be more concentrated than in the water column. In addition, the pollutants in the bottom sediments are likely to be coming from multiple locations throughout the harbor but have become concentrated in areas that undergo increased sedimentation. In general, for a complex water body like the LA/LB Harbor complex, it is difficult to identify meaningful direct “cause and effect” correlations between the receiving water pollutant concentrations and pollutant loadings from the immediate adjacent nearshore subwatersheds.	
M3.8	55	It was noted that the "Dominguez Channel was not included in this study, and therefore associated loads to Consolidated Slip are not presented in this report." However, Figures 30-35 indicate that the annual loadings to the Consolidated Slip include loadings from the Dominguez Channel. Need to explain how the loadings from the Dominguez Channel to the Consolidated Slip were calculated.	Document has been revised.
M3.9	55	Second paragraph under “Conclusion” states that “hourly loadings for LAR, SGR, and DC and daily loadings for the nearshore areas were incorporated into the receiving water model of the Harbors’ Need to explain why “daily” loading are used for the nearshore watersheds while “hourly” loadings are used for the other watersheds.	See response to **Comment M2.13** above.
M4	Table 3c. Appendix III Comments		
M4.1	III-4	The table for waterbody information summarizes the total deposition and is used to determine the loading capacity in each TMDL zone. The accuracy of the sediment deposition rate is important in defining the loading capacity. The sediment deposition rates are an order of magnitude too small when compared with known sediment deposition rates at the Los Angeles River Estuary (LARE) and San Pedro Bay from prior U.S. Army Corps of Engineers (USACE) studies. The USACE (2004) estimated that	Information from the 2004 USACE study was considered in model development, but the 2010 study was beyond the time period modeled for the TMDL. The rate of 86,000 m^3/yr of sediment is deposited within dredge areas of the LAR Estuary and has no associated area provided with it. Deposition simulations in the vicinity of LAR Estuary were provided to the reviewer two years ago and they agreed that they were realistic.

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		86,000 m3/yr of sediment are deposited within dredge areas of the LARE; whereas, the TMDL estimates an annual rate of only 15,100 m3/yr for the LARE. In addition, sediment deposition from the Los Angeles River has been studied by USACE (2010) using a numerical model of San Pedro Bay. Model sediment transport and deposition were validated based on field data of a synthetic tracer used to mimic sediment. Sediment loadings from the Los Angeles and San Gabriel Rivers were simulated for various return periods to estimate annual sediment deposition rates. Results from the USACE study were used to estimate the annual deposition in San Pedro Bay from Los Angeles River sediment loadings. It is estimated that 181,609,750 kg/yr deposits in San Pedro Bay from the Los Angeles River; while the TMDL deposition rate for San Pedro Bay is an order of magnitude lower at 19,056,271 kg/yr. Underestimating the sedimentation rate, in turn underestimates the loading capacity resulting in setting waste load and load allocations that are likely an order of magnitude lower than what the water body can actually assimilate and still meet water quality standards. Additionally, the annual sediment deposition rates generally result in a small depositional thickness. With the exception of the Los Angeles River Estuary, the annual depositional thickness is very small (order of mm) especially in the Inner and Outer Harbors. Hence, the contaminant concentration for the top 5 cm of the sediment bed represent a mix of newly deposited material and the existing sediment on the bed, and should not be used for the linkage analysis.	See also response to **Comment M1.11** above. It is also important to note that the LA River is a component of the study area, but is not the primary focus. The loading from this area is not necessarily representative of the Inner Harbors and other impaired waters. TMDL and model development were completed to meet consent decree deadline; therefore a ‘data cut-off’ was established as well as ‘no further’ model revisions date. Commenter has provided information after cut-off date and after ‘no further model revisions’ date. Such information may be considered as part of future TMDL update or model update; i.e., in preparation for the TMDL re-opener.
M4.2	III-4	The average simulated sediment concentration in the top 5 cm of the sediment bed is summarized for each TMDL waterbody. The average sediment concentrations were used to calculate the existing contaminant loadings to the sediment bed. This assumes that the top 5 cm of sediment accurately represents what is currently depositing into the sediment bed. In general, the sedimentation rate is relatively small, and in most cases,	See response to **Comment M1.11** above. Given that the sediment bed is a source of pollutant exposure to benthic organisms as well as diffusive source of aqueous pollutants to aquatic life in the water column, the existing sediment bed concentrations are applicable to the TMDL analyses.

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		the top 5 cm of sediment represents deposition over a long period time, not just one to four years. Need to revise the estimated contaminant loadings based on the actual deposition of the pollutant mass to the sediment bed or run the model for a longer period of time under deposition reaches 5 cm.	
M4.3	III-5	The table titled "Jurisdictional Area by TMDL Waterbody" summarizes the area of each MS4 permittee in each waterbody watershed, which were ultimately used to determine the MS4 waste load allocations. However, many of those areas shown in the table are different from the areas shown in the Draft TMDL Report and various figures and tables in other Appendices. • Based on the table here, the area for the Inner Cabrillo Beach watershed is 0.755 km2, which matches with one of the Nearshore subwatershed as shown on Figure 5-5 of the Draft TMDL Report. However, the area for the same subwatershed shown in Appendix II Table 1 is 1.14 km2. In addition, the watershed for the Inner Cabrillo Beach shown in Figure 5-5 of the Draft TMDL Report is different from the watershed areas shown in Appendix II Figure 23, the latter shows that the Inner Cabrillo Beach watershed is part of the Outer Harbor. Need to clarify the geographical boundaries for the jurisdictional area of Inner Cabrillo Beach and make changes in the corresponding figures and tables to show the correct area. • The table here shows that the total jurisdictional area for the Los Angeles River Estuary (LARE) watershed is. However, based on the Nearshore model subwatersheds depicted in Draft TMDL Report Figure 5-5 (see also Appendix II Figures 2 and 3) and corresponding areas of each subwatershed (Appendix II Table 1), the total area for the LARE nearshore subwatersheds is 0.79 km2 (194.2 acres for subwatersheds 17 and 18), significantly different form 2.85 km2 shown in here. • The Consolidated Slip (CS) watershed shown in the Draft TMDL Report Figure 5-5 (this figure is repeated in Appendix I Figure 39, Appendix II Figure 29, and Appendix III.8 Figure 1) shows one	See response to **Comment M2.27** above. These additional areas are also considered in the loading estimates, which explains the differences noted in the comment. Figure in document has not been updated. This is a reasonable decision based on limited budget and requirement to complete TMDLs within deadline.

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		Appendix III Comments February 9, 2011 Page 3 Item No. Page Section Issue Comments nearshore subwatershed that was used to determine the area of the CS watershed and jurisdictional areas for Caltrans and Los Angeles County. However, there should be two nearshore subwatersheds that drain into Consolidated Slip, as indicated in Appendix II Figure 23, with jurisdictional areas for Caltrans, Los Angeles County, and Long Beach. Need to explain how the CS jurisdictional area shown in here was determined. • The corresponding watershed for the Fish Harbor waterbody is not depicted in any of the figures provided in the TMDL documents; hence need to explain how the jurisdictional area shown here was determined. Understanding of the waterbody watersheds is critical to assess the MS4 allocations and watershed loadings. Please provide a map showing the geographic boundaries and corresponding model subwatersheds used to determine the jurisdictional areas of the waterbody watersheds. In addition, need to revise the figures mentioned above so that they are consistent with each other in defining the watershed area for each waterbody.	
M4.4	III-7	This section provides a summary of "the wet weather LSPC modeling results for the freshwater sections of the Dominguez Channel and the wet weather TMDLs calculated for copper lead, and zinc." However, no documentation regarding the development, assumptions and calibration of the LSPC model for the DC Watershed is provided, not following the EPA guidelines (2000) which state that "If the State cites documents as the basis for technical findings in the TMDL which are not submitted with the TMDL package, the TMDL document must clearly summarize the technical analysis supporting the findings concerning individual TMDL elements." Since the accuracy of the DC Watershed Model is critical for TMDL development and allocations, need to provide documentation on the	The LSPC models for the LAR and SGR are described in Tetra Tech, Inc., 2004 and 2005a (available on the Regional Board website for their applicable TMDL), while the HSPF model for the DC watershed is documented in SCCWRP, unpublished results (SCCWRP can be contacted regarding the availability of these unpublished results). These documents are cited in Appendix II. TMDLs have already been developed in the LAR and SGR watersheds; therefore, all associated documentation, including model reports discussing implementation and calibration, have undergone peer review. The DC modeling efforts, similar to LAR and SGR, utilize the regional modeling approach, which is also described in the technical documentation for the Ballona

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		development, assumptions taken and calibration of the model.	Creek metals and Santa Monica Bay Beaches bacteria TMDLs.
M4.5	III-51	The NAAQS lead deposition rate shown in Table 3 indicates units of ug/m3. However, based on the calculations of the air deposition loadings as described in Page III-49 and the waterbody area provided in Page III-4, the units should be ug/m2/day. Please revise units specified in Table 3.	We acknowledge the difference in units of measure; however they are correctly recorded in TMDL from the NAAQS rule as well as from monitoring results. It may require technical consultation with air quality scientists to make an equivalency determination.
M4.6	III.8-2	Figure 1 does not show the corresponding watershed area for the Fish Harbor waterbody, which is designated as a separate TMDL zone. Please revise the figure to include the area draining into the Fish Harbor.	See response to **Comment M2.27** above.
M4.7	III.8-2	The first paragraph on Page 2 describes the processing of model results into outputs of four-day averages, the latter were used then to determine masses and fluxes in each TMDL zone. Need to explain why a four-day average is used since a four-day average is typically associated with chronic water quality criteria for aquatic life in the water column, not the sediment bed.	The four-day average was a useful comparison as it is directly comparable the chronic CTR water quality criteria. Water column concentrations were initially evaluated using the CTR criteria, while subsequent comparisons focused on the sediment concentrations.
M4.8	III.8-3	In the second paragraph of Page 3, model results are described to show the interaction between TMDL zones. The text states "Model results showed the sequence of water bodies upstream of particular zones are the dominant source of upland pollutants to sediment." However, the descriptions of these interactions between waterbodies are contradicted by results presented and assumptions made in the TMDL allocations, which assumed that watershed loadings only impacted the downstream waterbody. Need to explain how the model results were used to show the dominant source of each waterbody. In other words, specify how the model results were used to determined the following: • "Inner Harbor – POLA" is impacted by pollutant source from the	The model simulations took the interactions between waterbodies into account; therefore, the conditions used to represent the TMDL and WLAs consider and quantify these interactions. The document has been revised to clarify the waterbody interactions and the role of the watershed loadings.

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		Dominguez Channel Estuary • "Outer Harbor – POLB" is impacted from the Los Angeles River Estuary In addition, need to provide the rationale why were no "Inner Harbor – POLA" allocations made for Dominguez Channel Estuary sources and why were no "Outer Harbor – POLB" allocations made for Los Angeles River or Los Angeles River Estuary sources.	
M4.9	III.8-3	The third paragraph states that four other model scenarios were explored, they are: 1) No Dominguez Channel scenario, 2) No LA River scenario, 3) No Nearshore scenario, and 4) Consolidated Slip cleanup scenario. Need to provide results for these model scenarios, as well as why these model results were NOT used for linkage analysis and subsequent allocations.	TMDL models are based on publicly available code. Once the TMDL is approved then EFDC and LSPC model output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction. These additional scenarios were not used for the allocations since they were specific to certain waterbodies and did not consider the loadings of all watersheds. The no uplands scenario was used in the allocations since it was comprehensive and provided necessary information on all TMDL zones.
M4.10	III.8-4	The percent contributions of copper from watershed sources were determined from the two modeling scenarios (% Diff Avg in Table 2). The results show negative percent contributions for the Fish Harbor, Cabrillo Marina, Inner Cabrillo Beach, and Outer Harbor – POLA. The negative percent contribution from watershed sources is physically impossible indicating that the methodology used is not appropriate to determine the percent contribution from watershed sources. In addition, these negative values were simply ignored when used to determine the TMDL waste load allocations (values were assumed to be positive). See Attachment 7 for major comments on technical analyses.	See response to **Comment M1.7** above.
M4.11	III.8-5	As shown in Figure 2 of Appendix III.8, for the existing conditions scenario, the copper sediment concentrations in CS shows an overall	See response to **Comments M1.6** and **M1.11** above.

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		increase over time. This is expected since CS is a known depositional area; hence, the increase in copper concentration merely reflects the deposition of copper from the two likely sources – 1) Dominguez Channel (DC) and CS Watersheds and 2) erosion from the bed of DC. By removing watershed copper sources (no upland source scenario) but not the source due to erosion from the DC bed, it is expected that the copper concentration in CS would still increase but to a lesser extent since there is a reduction in copper loadings. However, as shown in Figure 3 of Appendix III.8, the copper concentration in CS significantly and continually decreases over the 4-year simulation period for the no upland sources scenario. Since the CS water body is depositional, the decrease in copper concentration is unlikely to be caused by erosion of the CS bed. An explanation for the decrease in copper sediment concentration could be that for the no upland sources scenario, sediment from watershed sources were simulated without copper, i.e., the scenario was simulated with "clean" sediment. The continuous deposition of "clean" sediments to CS over the 4-year simulation period is illustrated in Figure 2 (a). This top layer of clean sediment mixed with the initial bed sediment leads to the decrease in copper concentration of the top 5 cm of the sediment bed. However, the difference in copper concentrations between the two model scenarios was wrongly interpreted to represent the contribution of upland watershed sources to the CS sediment bed. See Attachment 7 for major comments on technical analyses.	
M4.12	III.8-5	The significant decreases in copper sediment concentrations for the no upland sources scenario (Figure 3) indicates that the simulation time frame is arbitrary and does not reflect long-term or average conditions. For example, the copper sediment concentration for the no upland sources scenario in the Consolidated Slip has an average of 200 mg/kg (Figure 3) over the four-year simulation period and existing conditions scenario concentration of 260 mg/kg (Figure 2), which were then used to determine the 23% contribution from watershed sources. If a three-year	See response to **Comments M1.6** and **M1.11** above.

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		simulation period was used the average copper sediment concentration for the no upland sources scenario would be about 225 mg/kg (Figure 3), resulting in a 13% contribution from watershed sources. The arbitrary length of the simulation time frame is also shown based in Figure 3; following the trend in the decrease in copper concentration over time, the copper concentration could have been reduced to zero if the model was run for longer (say 30 years to deposit 5 cm) instead of four years. In general, the decrease in copper sediment concentrations further support that the no upland sources scenario (simulation of clean sediment) is not appropriate to determine the percent watershed contribution. See Attachment 7 for major comments on technical analyses.	
M4.13	III.8-10	Results in Table 5 indicate negative percent watershed contributions for Cabrillo Marina and Inner Cabrillo Beach, which are physically impossible. This reveals the fundamental flaw in the linkage analysis: 1) two model scenarios with existing and no upland load scenarios are not sufficient, and 2) the model results cannot be used to estimate the percent watershed contributions. See Attachment 7 for detail comments on the fundamental flaw of the linkage analysis.	See response to **Comments M1.6** and **M1.7** above.
M4.14	III.8-11	The base scenario PAHs results for the Cabrillo Marina indicate that under existing conditions the PAHs target sediment concentration will be achieved within about three years. These results indicate that no PAHs reductions are needed to achieve the target sediment concentration, thus the TMDL is not necessary.	The TMDL is necessary, since waterbody is impaired for PAHs. Currently available model output suggests that reductions may not be necessary; however, this may change with future monitoring results to be included in assessment and model evaluation.
M4.15	III.8-14	Results in Table 6 also indicate negative percent watershed contributions for DDT for Cabrillo Marina, which is physically impossible. See comment 13.	See response to **Comment M1.7** above.
M4.16	III.8-15	First paragraph of this section states that “For the TMDL scenario, copper hot spots within all zones were reduced…” However, results for	See response to **Comment M4.9** above. TMDL models are based on publically available code. Once the TMDL is

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		these scenarios are not provided. Please provide information on these TMDL scenarios, as well as how these results were used for linkage analysis. Last paragraph states that "overall, upland sources were contributing to the sediment bed impairments for metals in some zones, but model results suggest the upland sources are not contributing significantly to the sediment organics impairments". Need to provide model results of the TMDL scenarios and the analyses of the results to reach these conclusions.	approved then EFDC and LSPC model output information will be available for additional analysis; thus commenter can explore this topic to their satisfaction.