US Environmental Protection Agency Region IX

Response to Comments on the Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments

July 2, 2013

These responses to comments are based on comment letters submitted to USEPA in response to the Draft Malibu Creek and Lagoon TMDL noticed for public review on December 12, 2012.

COMMENTORS

Response to Comments on the Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments

December 12, 2012 Public Notice

July 2, 2013

RESPONSE TO COMMENTS

This document includes USEPA's response to comments submitted in response to the December 12, 2012 Public Notice of the Draft Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments. The comment letter submitted is provided on USEPA Region 9's website with highlighted comment notations added to the original letter at the end of each comment to identify the comment number (e.g., USEPA is responding to the specific comment immediately above the numbered "Comment" in red bold). Any change that is made to the TMDL in response to the comments is indicated in the response. If no change is noted in the response, then no change was deemed necessary in the TMDL. Please see (http://www.epa.gov/region9/water/tmdl/progress.html) for individual comment letters.

1. Las Virgenes – Triunfo Joint Powers Authority

Response to Comment 1-1

USEPA evaluated all available data sources, including the information supplied by NGOs, government agencies, cities, and municipalities. During analysis, we included all data that had consistent and recurring data points so that we could determine observable trends. The largest and longest data records were provided by the Heal the Bay Stream Team, Las Virgenes Municipal Water District, and larger technical reports by some cities (e.g., City of Calabasas) (Please see Section 7 and 8 for references to the extent of the source data sets). When evaluating these data sets, we also examined the methodology, collection standards, lab testing and QA/QC of the reported data. Fortunately, nearly all the data collection for water quality, benthic macroinvertebrates, and physical habitat followed the State's Surface Water Ambient Monitoring Program methodology. This allowed USEPA to compare the data sets collected by different entities. Furthermore, the benthic macroinvertebrate and physical habitat data collection were completed by the Heal the Bay Stream Team. Field instructors from California Department of Fish and Game (CDFG) trained the Stream Team to collect data and would often conduct field audits to ensure field methods and QA/QC procedures were followed. All lab analyses were subcontracted to CDFG (Personal Communication, Jim Harrington, CDFG). Analyses of these data sets have been reviewed by Southern California Coastal Water Research Project scientists.

The 2003 Nutrient TMDL did identify sources upstream of the Tapia Wastewater Reclamation Facility (WRF) and established nutrient load allocations for non-point sources in the upper watershed. However, USEPA disagrees with the statement, that "runoff from urban development above Tapia WRF was the primary cause of algal growth." USEPA's analysis showed that algal coverage was significantly greater downstream of Tapia WRF compared with sites upstream of WRF. Please see Response to Comment 6-8 below.

Because the impaired beneficial uses (WARM, COLD, WILD, RARE) are different than those identified in the 2003 Nutrient TMDL, this TMDL evaluated all the relevant data, stressors, and causes that could potentially impact the benthic macroinvertebrates and benthic community.

The 2003 Nutrient TMDL addressed beneficial uses related to ***nuisance*** effects such as algae, odors, and scum (RWQCB, 1996) (USEPA 2003). Specifically, the 2003 Nutrient TMDL addressed depressed dissolved oxygen and excess nutrient loads that resulted in "nuisance" impacts to recreational uses, including the negative visual and odorous presence of scum and algae. The evidence assessed to establish the 2003 Nutrient TMDL demonstrated the significantly elevated levels of nitrogen and phosphorus in Malibu Creek. The presence of excessive algae was a visual indication of Tapia WRF's cumulative impacts on the nutrient balance in the stream. The State had independently required the Tapia WRF to address ammonia loads and to meet the region wide prohibition on summer discharges before the establishment of the 2003 Nutrient TMDL. Although improvements are observed, particularly during the prohibition period in summer, USEPA cannot ignore the record of data collected since 2003

USEPA has determined that the Tapia WTP discharge is responsible for approximately 35% of the watershed's total nitrogen load and 62% of the total watershed's total phosphorus load during the winter discharge period (See Section 5 for the details of Tapia's relative contribution). In the summer prohibition period, because the Tapia effluent is not discharging into the Malibu Creek main stem, it is not a contributing source . Consequently, USEPA established wasteload allocations only for the winter discharge period based on our understanding of the plant performance and taking into consideration the technological feasibility of meeting the WLA. USEPA engaged in several discussions with the Las Virgenes-Triunfo Joint Powers Authority / Las Virgenes Municipal Water District (the JPA) on the current performance of the Tapia WRF and the potential for improving performance. The wasteload allocations are set at levels that the Tapia WRF appears capable of meeting through improvements to the performance of the existing infrastructure. The JPA did not provide USEPA with information which indicates that upgrades to reverse osmosis will be necessary.

Response to Comment 1-2

USEPA requested information from the commenter regarding the claimed costs of compliance with the proposed TMDLs. The commenter did not provide this information to USEPA. However, USEPA understands that the commenter believes that future NPDES permits for the Tapia WRF, which incorporate discharge limitations derived from these TMDLs, will necessarily require it to construct new wastewater treatment facilities, and possibly require reverse osmosis treatment of all of its wastewater. USEPA has consulted with the JPA and clarified the expectations for the Tapia WRF. Based on the operational details we obtained from the JPA, and experience of other wastewater treatment plants across the country which implement equivalent advanced nutrient removal technology, it appears to USEPA the Tapia WRF will be capable of achieving its assigned WLAs without the need for significant new capital investments.

Response to Comment 1-3

Beginning in January 2011, soon after USEPA began the process of developing the TMDL, we contacted the local watershed stakeholder group, the Malibu Creek Watershed Management Committee, to inform the group that USEPA would be developing TMDLs to address impairments to benthic macroinvertebrates and sedimentation in Malibu Creek and Lagoon. USEPA made regular requests for data, information, or comments on the process and information presented. We presented to the Malibu Creek Watershed Management Committee, which included representatives from all the incorporated cities in Malibu Creek Watershed, on at least a quarterly basis. USEPA participated and provided updates and presentations to the Watershed Management Committee on March 1, 2011, July 9, 2011, January 19, 2012, April 26, 2012, and October 9, 2012. At these meetings, USEPA discussed the status of the TMDL and the analytical efforts, including receiving comments and recommendations on the development of the

TMDL. USEPA provided a pre-draft TMDL for review and comment to the Watershed Management Committee members on October 9, 2012. USEPA released the draft TMDL on December 12, 2012 and notified persons and organizations who had previously indicated an interest in the Malibu Creek and Lagoon TMDL by email, and posted notice of the draft TMDL on USEPA's website and the State Water Resources Control Board's lyris list serve. USEPA provided 45 days for receipt of public comments and held a public meeting on January 14, 2013. Because of the strong public interest, USEPA also held a public workshop on these TMDLs on May 1, 2013.

The timing of the public notice and comment period was a result of the schedule for establishment of TMDLs in the Los Angeles region required by an amended consent decree between USEPA and environmental plaintiffs. The amended consent decree required USEPA to approve or issue the final TMDLs on the schedule by May 24, 2013, and the Malibu Creek and Lagoon TMDLs are the last of these TMDLs to be completed. After the close of the comment period, the environmental plaintiffs agreed to extend the deadline to July 2, 2013, in part because of the large number of comments received on the draft TMDLs. Based on the many detailed comments received from the JPA and others, it appears that most commenters were able to review and comment on the draft TMDL within the timeframe.

USEPA disagrees with the comment that USEPA hindered the commenter's ability to review the Draft TMDL because the Agency did not provide the necessary reports and data. As noted above, USEPA has been in constant discussion with the commenter and other major stakeholders in the watershed. USEPA received all the data for review from external sources, including a significant data set from the commenter. USEPA informed the commenter that the State completed the listing impairment and that USEPA did not have the raw data, but the summarized data provided by the State. USEPA referred this 1996 Water Quality Report to the commenter. The data that USEPA reviewed for analysis of the SC-IBI scores were provided by the external entities (i.e., Heal the Bay; LVMWD; LA County; MCMWP) who conducted the monitoring. USEPA also provided the detailed analysis of the SC-IBI bioscores and the consideration of the reference sites in the Draft TMDL (December 2012).

Response to Comment 1-4

Some commenters questioned the applicability of the SC-IBI for Malibu Creek Watershed. To address this, USEPA computed the additional bioscores, CSCI, pMMI, and O/E, developed by the State Water Resources Control Board's Biological Objectives Science Team to establish a statewide policy for biological objectives. The results show that when Malibu Creek Watershed's geologic characteristics, i.e., geologic predictor variables, are specifically factored in, the bioscores provide comparable results and conclusions as those observed with the SC-IBI bioscores. The Monterey/Modelo Formation, by itself, does not lead to lower benthic community condition, which indicates that other anthropogenic sources are causing the impairment. Please also see Response to Comment 1-2 and 1-3 above.

Since this comment is a summary of the many detailed comments, please see "Responses to the Detailed Comments," below, regarding comments on salt and ionic strength of Malibu Creek's water and other related technical comments.

Response to Comment 1-5

USEPA disagrees with the commenter that this TMDL is dismissive of the USEPA's own guidance and existing research on natural geologic impacts. USEPA provides the available data and information on the nature of the Monterey/Modelo Formation in Malibu Creek Watershed. The TMDL supports the finding that this Watershed includes areas with naturally elevated dissolved solids or salts, and elevated conductivity levels. We discuss our analysis and observations in Sections 7 and 8 of the TMDL. We note that the Miocene Monterey Formation is not unique to Malibu Creek Watershed and is widely present in

the California Coast Ranges, Transverse Ranges, and adjacent basins (e.g., San Joaquin Valley, the onshore Santa Maria basin, and the Ventura basin) (Isaacs, 1984)[1]. In our assessment of the benthic macroinvertebrate community condition and related benthic measures (e.g., algal coverage), sites located in the Monterey/Modelo Formation areas that are unimpacted by upstream or adjacent anthropogenic activities consistently demonstrated high bioscores compared to other sites in the Watershed. Furthermore, the commenter observes that the diatom community, floating macroalgae, and native freshwater fish species, arroyo chub, are all highly tolerant of salty and high mineral waters. If the other biological aquatic life are highly tolerant of salty and high mineral waters, we would also expect that the native benthic macroinvertebrate community to be similarly tolerant of the salty, brackish waters; in other words, we would expect to see fair or better benthic macroinvertebrate condition relative to other sites. Our assessment of the data supports these findings.

Response to Comment 1-6

In response to comments and requests for this TMDL and for the Ventura River Reaches 3 and 4 TMDL, USEPA provided approximately a 15- week extension of the deadline.

From the beginning of the TMDL development process, USEPA engaged in extensive discussions with the commenter regarding the evaluation of water quality and biological data, the geology of the Malibu Creek watershed, and development of the TMDLs. See Response to Comment 1-2. USEPA was able to obtain two extensions of time from the plaintiffs in the Heal the Bay consent decree, in large part to continue discussions with the commenter and hold a public workshop to further address these concerns.

USEPA is not establishing a phased approach for the TMDLs, as the commenter requests. However, USEPA recognizes that the collection and analysis of relevant data is expected to continue, and that this information will lead to the development of a State Implementation Plan that will detail out the phased steps as requested by the commenter. The State Los Angeles Regional Water Quality Control Board (Regional Board) maintains the implementation authority of TMDLs in the Los Angeles region. As such, USEPA included detailed recommendations on adopting an adaptive management or phased TMDL approach when implementing the TMDLs. The Regional Board has stated their plans to develop the Implementation Plan for this TMDL as soon as possible (Personal Communications, Sam Unger, EO of Regional Board).

Response to General Technical Comments

Please also see USEPA's response to the detailed technical comments, which also provides a response to the summarized General comments.

Response to Comment 1-G1

USEPA has been in continuous discussion with the SWRCB State Bio-Objectives Science Team to support the state's effort and to include the CSCI calculations, when the model became available (which was not available for the Draft TMDL). Therefore, the draft document relied on the SC-IBI, which was the basis for the impairment listing. As part of the effort to ensure that the most current methodologies

[1] Isaacs, C.M. Geology and Physical Properties of the Monterey Formation, California. SPE California Regional Meeting, 11-13 April 1984, Long Beach, CA. Conference Paper. Society of Petroleum Engineers.

are incorporated, USEPA worked with SCCWRP to test, document, and debug the code used to create the new indices following the public comment period. These have now been calculated for all Malibu BMI samples with adequate taxonomic data and are discussed at length in the final TMDL. This TMDL includes the CSCI and SC-IBI bioscores. The Malibu Creek Watershed CSCI bioscores factored in the local watershed characteristics including gradient, geology, precipitation, etc. These indices provide multiple lines of evidence and confirm conclusions observed by the SC-IBI results.

Response to Comment 1-G2

USEPA clarified and discussed in more detail the selection of reference sites in this study. The coastal sites on Lachusa and Solstice Creek are used because they reflect elevation and climate similar to the lower Malibu Creek main stem sites. The sites, CH-6 site on Cheseboro Creek and LV-9 on Las Virgenes Creek, were consistently used as comparator/reference site, specifically for the purpose of representing conditions in the drainage of the Monterey Formation with high ionic strength. Additional discussion is provided in the TMDL regarding these sites. Since the Malibu Creek Watershed represents a mix of marine and non-marine sediments, it is appropriate to include both types of reference sites.

Response to Comment 1-G3

USEPA did not receive the National Park Service monitoring data in time for inclusion in the Draft TMDL. These data provide valuable additional information on background conditions of various parameters, but do not alter any fundamental findings. Summaries of these data have now been inserted into Section 7.1, 7.3, 7.4, and 7.5. See also responses D-25 and D-38.

Although data on the Calabasas Landfill monitoring is informative, it did not significantly change the observed findings assessed from all the other sites. The additional data are also now referenced in Sections 5 and 7.

Response to Comment 1-G4

USEPA agrees a CADDIS causal assessment with stakeholder participation would help improve future causal assessment efforts. USEPA included this in our recommendations.

Response to Comment 1-G5

USEPA disagrees with the comment that this TMDL analysis should limit its finding to year-round flow. Since the SC-IBI and other bioassessment scoring tools are focused on the southern California regions where most of the watersheds are intermittent or ephemeral in nature, it is appropriate use these tools to evaluate relevant information.

Response to Comment 1-G6

It is clear that the lowest section of the Malibu Creek main stem and various portions of Malibu Creek tributaries often exhibit low flow; however, this is reflective of the flow conditions in the Watershed. The LA Co. F-130 gage flow has been continuous in recent years. The recently established USGS gage near the mouth of Malibu Creek has reported periods of zero flow, especially during 2009. However, this really means zero surface flow and flows deeper in the water column, such as pools, are not captured. Pools present in the stream during such periods are connected by subsurface hyporheic flow (see also

Comment 1-D13 and Comment 1-D14). In addition, Heal the Bay samples include visual observations of flow at their sampling sites, which are very rarely characterized as "none".

The commenter suggests that the TMDL analysis should limit algal percent cover and nutrient water quality assessment to periods of time with flow. While it is clear that "stagnant" flow conditions can contribute to algal overgrowth, this suggestion is both impractical and inappropriate. Flow gaged data were always available coincident with stream monitoring data at site MC-12 (flow is always present) and at MC-1 (where flow has been gaged since December 2007). The vast majority of Heal the Bay stream monitoring data also reported some flow even when zero flow was reported at the USGS gage station. For these reasons and the fact that other quantitative information was not available at any other monitoring point, it would be impractical and inappropriate to exclude these data. Furthermore, the Basin Plan assigns the COLD and WARM beneficial uses to Malibu Creek on a year round basis; it would be inappropriate to disregard the State's definition for the beneficial uses. The Basin Plan states, "Beneficial uses can be designated for a waterbody in a number of ways. Those beneficial uses that have been attained for a waterbody on, or after, November 28, 1975, must be designated as "existing" in the Basin Plans. Other uses can be designated, whether or not they have been attained on a waterbody, in order to implement either federal or state mandates and goals (such as fishable and swimmable) for regional waters." The Basin Plan does provide an option for intermittent designations of beneficial uses. The WARM aquatic life beneficial use is assigned as intermittent only for Medea, Lindero, Triunfo, Lake Eleanor, and Hidden Valley Creeks in the Malibu Creek Watershed; Malibu Creek and other tributaries have this use assigned on a year round, continuous basis. For modifications to the beneficial uses and their applicability, a standards change or basin plan amendment must be requested and submitted to the State and USEPA for review and approval.

Response to Comment 1-G7

This TMDL incorporated the approach currently proposed by the State Board Biological Objectives Science Team. Please also see Response to Comment 6-15.

Response to Comment 1-G8

USEPA maintained the existing algal thresholds established in the 2003 Nutrient TMDL. Based on USEPA and State Board supported scientific analysis in the Nutrient Numeric Endpoint (NNE) model developed for the Malibu Creek Watershed, these thresholds are not inconsistent with the initial findings. The State Board is currently developing NNE objectives for regions in California. When the State Board finalizes its guidance or policy, the Regional Board may reconsider these thresholds where additional data are provided.

Response to Comment 1-G9

USEPA disagrees with the suggestion that the "TMDL should assess algal biomass using ash free dry weight and not by using chlorophyll-a." First, the existing data are in the form of percent cover and benthic chlorophyll *a* density; very few measurements of ash free dry mass (AFDM) were collected. The bulk of the literature values on benthic algal biomass and targets are also reported as milligrams of chlorophyll *a* per square meter and the draft CA NNE approach has proposed chlorophyll *a* density as the most appropriate nutrient numeric endpoint in streams. Furthermore, AFDM is not always the best measure of eutrophication response. The chlorophyll content of benthic biomass is highly variable, and

can contain a substantial proportion of heterotrophic bacteria and fungi, especially downstream of wastewater discharges[2].

Response to Comment 1-G10

USEPA provided the draft Sikich et al. (2012) report to interested stakeholders, including the JPA, soon after the public notice of the draft TMDL. The final report by Sikich et al. was released in March 2013 and is available at

http://www.healthebay.org/about-bay/current-issues/keeping-ocean-healthy/malibu-creek-watershed

Response to Comment 1-D1

USEPA did conduct a detailed Stressor Identification Assessment with the guiding principles established in the CADDIS approach. Additional submitted information during the draft TMDL comment period is included in this final TMDL. USEPA re-analyzed all the available information during the final development of the TMDL and clarified our assessment of stressors, sources and causes of impacts in the Malibu Creek Watershed. The TMDL clarified the information on Tapia WRF's non-discharge during the summer prohibition period and the presence of naturally observed seasonality and flow conditions. Please see discussion on pesticides in Section 7 of the TMDL.

Response to Comment 1-D2

The statement that "seasonal analyses were not done or presented in sections 6, 7, or 9" is incorrect. Table 6-2, Figure 6-6, Table 7-8, and Figure 7-13 all present seasonal results. However, we agree that additional presentations of the nutrient and algal data on a seasonal basis are appropriate. These have been added to the TMDL.

USEPA provided distinct nutrient limits for the dry and wet seasons in Malibu Creek Watershed in the Draft TMDL. We have included more clarity on identifying the correlations between dry and wet seasons and the non-discharge and discharge periods for the relevant permittees.

Response to Comment 1-D3

See the Response to Comment 1-D2. Because the Tapia WRF only discharges treated effluent during the winter season, Tapia WRF is not a contributor of nutrient load in the summer prohibition period. The seasonal analysis in Table 7-9 already shows that N concentrations are much lower during the non-discharge season.

Response to Comment 1-D4

4a: Comment noted

4b: The cited text should refer to Table 7-6, not Table 7-7, and to station MC-15, rather than MC-1. Table 7-6 (revised) shows that nitrate plus nitrite N has not exceeded the TMDL target during the summer

[2] Fjerdingstad, E. 1964. Pollution of streams estimated by benthal phytomicroorganisms. I. A saprobic system based on communities of organisms and ecological factors. *Int. Rev. Geol. Hydrobiol.*, 49:63-131; Collins, G.B. and C.I. Weber. 1978. Phycoperiphyton (algae) as indicators of water quality. *Trans. Am. Microscop. Soc*., 97: 36-43.

non-discharge period for 2005 on at MC-12, and has exceeded the TMDL target only once (4.17% of Heal the Bay samples) at MC-1 since 2005. However, 30 percent of summer non-discharge samples at MC-15 exceeded the target. The text on page 2-8 has been corrected and Table 7-6 includes a footnote to indicate only one summer excursion at MC-1.

Response to Comment 1-D5

USEPA disagrees with the comment that only two reference sites in coastal drainages not affected by marine sediments were presented. As stated in the Draft TMDL, and more thoroughly described in Section 8.1.3 of the final TMDL, USEPA made use of multiple comparator/reference sites, including Lachusa Creek (LCH-18), Solstice Creek (SC-14), Cheseboro Creek (CH-6), and Las Virgenes Creek (LV-9). The first two sites were recommended by Heal the Bay as appropriate coastal comparator/reference sites, but do not drain the marine sedimentary geology that is found in the northern portions of the Malibu Creek watershed. The latter two sites drain the Monterey/Modelo Formation and are appropriate reference sites for this assessment because they are located in areas of the watershed that are unimpacted by development yet show elevated levels of specific conductivity that are similar to those seen in other streams in the area.

Other sites were also considered for use as comparator/reference sites for this assessment. However, data quality rules adopted for the analysis required use of sites with at least 5 sets of BMI observations to help adjust for large amounts of temporal variability in individual observations. Most other sites, including Heal the Bay and Malibu Creek Watershed Monitoring Program (MCWMP) sites, had less than 5 sets of BMI observations and were not included. The relatively pristine upper Cold Creek site (CC-3), which has excellent biology and good physical habitat, was not used as a reference site due its higher elevation and higher gradient relative to the impaired stations in the watershed.

MCWMP site LV1 is not included as a comparator/reference site because it has only two samples (from a single year) and, as noted in the comment "is not a pristine site." It is located downstream of LV-9 near the point where residential development commences. LA County Site 16 has four reported scores. However, the two sites are approximately co-located and could be evaluated together. The results show poor biology, with much lower scores than at the upstream LV9 station (median SC-IBI of 29; median pMMI of 0.67). It is important to note that this location was not selected as a reference site by either MCWMP or LA County, but rather was selected because it is located near the county line. Aquatic Bioassay (2005, p. 14) describes the physical habitat at this site as follows: "The upper Las Virgenes Creek site (LV1) was the only site that ranked in the poor category. This site has been heavily impacted by bank erosion and sedimentation. The western bank is cement stabilized with a road on top and a residential community up above. There are several drainage pipes lying in the streambed and exposed in the eastern bank. Recent fires have helped to denude the banks of vegetation and the streambed is filled with reeds and cattails. As a result this reach scores low for instream cover, embeddedness, channel alteration, riffle frequency, and vegetative protection." Sampling notes from LA County in later years suggest that physical habitat at this site continued to be poor. For example, in 2008 turbidity was measured at 93.9 NTU during dry weather conditions, an order of magnitude higher than seen at other sites.

The evidence thus indicates that LV1/LA County 16 is not an appropriate comparator/reference site; indeed, it appears to be a highly impacted with degraded physical habitat due at least in part to anthropogenic disturbances. We do agree that conditions at these sites are worthy of further discussion, which has been included in Section 8.1.3.

Evaluation of representative comparator/reference sites is appropriate for this assessment because these sites are intended to show the quality of benthic macroinvertebrate assemblages that is attainable in this landscape absent other constraints.

Response to Comment 1-D6

Comment noted. Monitoring of the algal cover in the future should use the recently available algal bioassessment percent cover method developed for the State's Surface Water Ambient Monitoring Program (SWAMP). Although the HtB data between 2005-2010 were based on visual observation, this information is critical because it provides a qualitative assessment of benthic algal coverage. To clarify the HtB methodology[3] quantitatively evaluates percent cover based on full tabulation of two transects within a long glide or combination of glide and riffle that "represents what algae is like throughout the entire stream reach."

Response to Comment 1-D7

7a. USEPA disagrees that the Southern California IBI has been shown to be an inaccurate tool. The SC-IBI is a multi-metric index designed to evaluate functional measures of benthic health. It was developed using benthic macroinvertebrate data collected from over 200 reference sites in southern California; these reference sites captured a range of regional characteristics and generated benthic function metrics reflective of reference stream conditions in southern California. Because the marine Monterey/Modelo geologic Formation are found in many parts of southern California, the SC-IBI is appropriate and applicable to Malibu Creek Watershed. USEPA worked with the Biological Objectives Science Team on beta-testing the models and have incorporated the analyses and results in the Final TMDL. This comment does not provide evidence to support the assumptions that the SC-IBI is not an accurate tool.

7b. USEPA disagrees with the comment that appropriate predictor variables and reference sites are unknown for the SC-O/E. USEPA consulted closely with the Statewide Biological Objectives Development, which is conducted by the Southern California Coastal Water Resources Program's (SCCWRP) Science Team and reviewed by a panel of national scientific experts in the field. USEPA worked with the SCCWRP Science Team and followed the approach and methodologies used to develop the draft statewide effort. For the final TMDL, the O/E reference model developed for California's CSCI (California Stream Condition Index) scoring tool includes independent predictor variables for elevation, catchment area, air temperature, precipitation, and latitude. The scoring tool O/E model does not include any predictors based on geology or ionic strength; however, the new draft scoring tool pMMI model does include geology as a predictor. This same approach and methodology are being applied to the entire state of California and includes over 1,600 reference sites, with 96 reference calibration and 23 reference validation sites located in southern coastal CA. Although none of the reference sites were located in the Malibu Creek watershed, five reference calibration sites are located within the Monterey Formation, between 12 and 17 miles north of the watershed. Further evaluation of the ranges of the predictor variables for these reference sites showed that it was consistent with those observed for Malibu Creek Watershed. Furthermore, this is a second line of evidence in evaluating the condition of the benthic macroinvertebrate community. The use of the Southern California IBI was included as another line of evidence. In this latter approach, USEPA used reference sites only collected in the Malibu Creek Watershed. The commenter has asserted in many instances that the data used or evaluated was not reflective of the natural variation of Malibu Creek Watershed. We note that in response to this commenter's request, USEPA included the CSCI approach as a second line of evidence and provided another assessment of the benthic macroinvertebrate condition. Both lines of evidence support USEPA's conclusion that the benthic community is impaired.

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[3] *The Freshwater and Marine Field Team Guide.* http://sites.healthebay.org/assets/pdfdocs/streamteam/FieldGuide.pdf.

7c. USEPA evaluated the algal cover targets established in the 2003 Nutrient TMDL. USEPA continues to support the Regional Board's assessment threshold. In USEPA's earlier response on the 2003 Nutrient TMDL, we stated that "Biggs recommended a threshold of 30% algal cover for filamentous algae greater than 2 cm in length. He also recommended a threshold of 60% cover for bottom algae (diatoms and blue green algae) greater than 0.3 cm thick. These thresholds were designed to protect human use (aesthetic/recreation). The Regional Board used 30% cover in greater than 10% of the samples as an assessment threshold in their 2002 303(d) listing process. We believe that it is appropriate for the Regional Board to use information from the scientific literature to inform their assessment process as part of best professional judgment." These thresholds continue to be used as assessment thresholds by the Regional Board to protect recreational use, which continues to be an existing beneficial use in Malibu Creek Watershed.

USEPA disagrees with the commenter's interpretation and conclusion of Biggs (2000). USEPA met with the commenter in December 2010 and received the information submitted. However, after further review and evaluation of Bigg's report, USEPA concludes that algal cover is a critical indicator of the condition of the stream and the benthic community. Biggs (2000) does state "if the local geology is dominated by nutrient-rich Tertiary marine siltstones, filamentous algal blooms are likely to occur naturally." USEPA acknowledges this possibility; however, the 30% coverage should continue to be the target unless it is not achievable due solely to natural conditions. Nutrient concentrations in much of the Malibu watershed are elevated by anthropogenic concentrations and should be managed to not exceed natural conditions, as discussed further below.

USEPA disagrees with the commenter's general conclusion of Stein and Yoon's (2007) study on water quality and loads from natural catchments in Southern California Streams. For more detailed discussion, please see our Response to Comment 1-D86. USEPA acknowledges that higher algal concentrations may occur where natural geology causes elevated nutrient concentrations. For that reason, our analysis evaluates appropriate nutrient reference conditions for the Malibu Creek watershed.

Most importantly, USEPA did not apply the nutrient concentration targets associated with the 150 mg/m^2 algal biomass nuisance threshold derived from the CA NNE framework. In the proposed TMDL, USEPA included and discussed all of the relevant data and analysis completed for the Malibu Creek Watershed to date. The commenter mistakenly concluded that this proposed TMDL applied the 150 mg/m^2 limit derived from the CA NNE framework because USEPA conducted a comprehensive review of all available data and analysis. The results of the NNE analysis relative to the 150 mg/m^2 target (Appendix F) concluded that the total nitrogen (TN) and total phosphorus (TP) concentration limits to achieve this target would be:

- 0.24 mg/L TN and/or 0.0033 mg/L TP for the summer period.
- 0.65 mg/L TN and 0.090 mg/L TP during the winter period (11/16 – 4/16), with lower light availability.

The Draft TMDL proposed the following instream concentrations:

- 0.65 mg/L TN and 0.10 mg/L TP for the summer period.
- 1.0 mg/L TN and 0.20 mg/L TN for the winter period

USEPA disagrees with the commenter's conclusion because USEPA did review and consider all of the available information and scientific analysis completed for Malibu Creek Watershed. USEPA believes that the commenter misinterpreted the analysis and conclusions in the Draft TMDL.

Response to Comment 1-D8

We appreciate the additional information on the geology of the watershed. The text cited in Section 4.4 referred to the Santa Monica Mountains in general, and not specifically to the Malibu Creek Watershed. While there is some dispute among different sources, we accept the corrections provided by the comment and have changed the text accordingly. We note that the comment reaffirms the geology of the basin is mostly (62%) non-marine in origin.

Response to Comment 1-D9

As suggested in the comment, "Triassic" has been corrected to "Miocene".

Response to Comment 1-D10

Suggested change has been made throughout the TMDL.

Response to Comment 1-D11

There is a typographical error in the cited sentence. Where the text says "glacial geology" it was intended to say "spatial extent of geology." Obviously, there has been no recent glaciation in this watershed. In addition, we have corrected "metavolcanic" to "volcanic" as suggested in the comment.

Response to Comment 1-D12

USEPA recognizes the significant role of the Monterey/Modelo Formation in the geochemistry of the watershed. Consequently, this TMDL describes the background of the geologic formation and presents detailed analysis of the data as it is related to the Monterey/Modelo Formation in the Watershed. Earlier drafts of the TMDL document did refer to this sedimentary formation as the Monterey Formation. However, the naming was changed to the Modelo Formation based on stakeholder comments.

USEPA finds the discussion in the TMDL appropriately represents the nature and influence of the Monterey/Modelo Formation. However, the Modelo Formation is mentioned earlier in the draft (in Section 3.1) without this context. Therefore, the text has been changed in Section 3.1 to refer to the "marine sedimentary Modelo or Monterey Formation" at first reference.

Response to Comment 1-D13

It is clear that base flows have increased over time in the Malibu watershed (although this is likely not an important factor in the current impairment). The comment suggests that the NRCS (1995) report is incorrect and that isotopic analyses by USGS (Hibbs, 2012) indicate that summer base flow in the urbanized sections of Las Virgenes Creek in 2007-2008 is less than 10 percent from imported State Water Project water, while the imported water fraction of Malibu Creek just above the lagoon is also "very low" (unpublished personal communication).

The intention of the discussion on p. 6-1 was to document that baseflow has increased, likely due to landscape irrigation. The water used for landscape irrigation is likely a mixture of Project water, reclaimed wastewater, and ground water. Further, the isotopic signature of base flow is not necessarily the same as the water source because the water has percolated through local soils (often marine sediments) and comingled with local groundwater before emerging in streams. Onsite wastewater disposal is also a source of enhanced baseflow, and will not have the isotopic signature of Project water. Thus, landscape irrigation and onsite wastewater disposal enhance baseflow, but do not necessarily

replicate the ultimate source of the irrigation and potable water; rather, these sources raise the local water table and cause a greater discharge of mixed Project water, domestic wastewater, and local ground water to the creek.

It is not appropriate for USEPA to remove the discussion on urban runoff's role in increasing flows to Malibu Lagoon. We acknowledge *surface* flow at the new USGS gage 11105510 is often zero during the summer period. However, this does not indicate zero flow from the watershed to the lagoon; it appears flow is proceeding by hyporheic pathways in the sand and gravel of the stream bed. The statement that during the summer "flows cease" is imprecise. Instead, surface flows often cease.

The cited sentence on p. 8-24 (Section 8.2) has been modified to say that Malibu Creek "now receives year-round flow (by surface and subsurface pathways) due to irrigation water, treated wastewater inputs, and other urban related runoff." Similarly, the cited sentence on p. 9-20 has been modified to say "Moreover, Malibu Lagoon now receives year-round surface and sub-surface flow input due to irrigation water, onsite wastewater disposal, and other urban-related runoff." The other cited sentences do not require modification.

Response to Comment 1-D14

It is instructive to compare flow measurements at the LA County flow gage and the USGS gage just upstream of Malibu Lagoon. Most coastal streams in southern California show flow proceeding by both surface pathways and shallow subsurface pathways in the alluvial material (hyporheic flow). During dry periods when the water table is below the stream invert, most flow may be by hyporheic pathways. Nonetheless, this subsurface flow is still downstream flow.

The comment notes that flow at the LA County gage proceeds "over a concrete apron with underlying bedrock, forcing water to the surface." In fact, it is these conditions that make the County gage a better indicator of the total flow (surface and hyporheic) from the watershed to the lower segments of the Creek and to the Lagoon.

The description in the Draft TMDL, attributing the difference in flows between these gages to evaporation and uptake by riparian vegetation, is incomplete. The sentence has been modified to emphasize the potential role of loss of surface flow to hyporheic flow in the alluvium.

Data analysis suggests that the flow augmentation at the Tapia discharge to support endangered steelhead is a minor impact. The requirement was put in place in 1997, and Tapia's records show that these releases are infrequent. Since 2000, flow augmentation for steelhead has occurred only in 2007-2009, amounting to 0.55 MG in 2007 (9/13-9/18), 0.58 MG in 2008 (9/11-9/15), and 9.17 MG in 2009 (7/24-7/28, 9/1-10/12). Releases before 2000 are not clearly attributed to a cause. The maximum daily flow augmentation release after 2000 was about 0.36 cfs.

Response to Comment 1-D15

The Tapia WRF discharge has had an effect on the flow durations in the system. Figure 6-2 in the Draft TMDL report shows that baseflows in the Malibu Creek watershed increased in the late 1960s, consistent with the timing of the creation of the Tapia discharge and increasing development in the watershed. The suggestion that the TMDL findings on the low flow analysis should be revised "to account for the required discharge" is not appropriate, as conditions in the lower sections of Malibu Creek are affected by the net amount of flow, whether natural flow, required discharges, or unintentional discharges from Tapia. The text on p. 6-4 has been clarified to indicate that increases in base flow are in part due to Tapia discharges. However, as noted under Response to Comment 1-D14, flow augmentation releases have occurred only during limited periods of time.

Because the analysis is intended to address total flow in lower Malibu Creek (area where gaging is available), the Pre-Post Impact Flow Duration Curves have not been revised.

USEPA appreciates the addition of other potential causes of increased baseflow, and have added these to the TMDL. The statements by NRCS report have been retained since these are derived directly from the report. The cited text on pages 6-6 and 6-7 has been modified to state the observed change.

Response to Comment 1-D16

Please see Response to Comments 1-D14 and Comment 1-D15.

Response to Comment 1-D17

USEPA agrees that the existing Table 6-2, while it provides useful information, could be misconstrued. To provide for comparison across similar time periods we added an additional column to show the results from the F-130 gage for a period similar to that available from the downstream USGS gage. In the expanded table presented below, the removal of the steelhead augmentation flows, using flow records provided by LVMWD, has almost no impact on the mean and median flows.

Table 6-2. Monthly Flow Averages (cfs)

Month	USGS 11105500/ F-130, 1931-2010		USGS 11105510, 12/2007-2010		F-130, 12/2007-2010		F-130, 12/2007-2010 with flow augmentation removed	
	Mean Flow	Median Flow	Mean Flow	Median Flow	Mean Flow	Median Flow	Mean Flow	Median Flow
Jan	82.7	10.3	183.9	18.0	87.0	12.8	87.0	12.8
Feb	100.9	16.7	97.7	52.0	73.3	39.9	73.3	39.9
Mar	80.1	17.1	29.9	24.0	22.8	20.0	22.8	20.0
Apr	25.4	9.6	19.7	16.0	13.2	12.7	13.2	12.7
May	10.1	5.1	6.4	5.8	6.1	5.5	6.1	5.5
Jun	6.9	3.1	1.5	1.0	3.8	3.9	3.8	3.9
Jul	3.4	2.0	0.1	0.0	2.2	2.1	2.2	2.1
Aug	2.4	1.5	0.0	0.0	2.2	2.2	2.2	2.2
Sep	2.7	1.5	0.0	0.0	2.4	2.2	2.3	2.1
Oct	3.7	1.5	2.2	0.0	1.3	1.3	1.2	1.3
Nov	10.6	2.9	3.3	0.1	7.2	2.9	7.2	2.9
Dec	26.4	6.1	27.4	13.5	20.0	12.5	20.0	12.5

Response to Comment 1-D18

The F-130 gage location is the only gage station with a sufficient period of record to perform IHA change analysis. Conditions in the lower sections of Malibu Creek are influenced by the net amount of flow, including, natural flow, required flow augmentation discharges, discharges from Tapia, stormwater flow, and other non-point sources of flow. Therefore, it is not appropriate to revise the change analysis to correct for specific sources of increased base flow. A note has been added to the text to point out that the change analysis is not fully representative of changes upstream of Tapia.

Response to Comment 1-D19

The suggested footnotes are not necessary for Table 6-3. However, the title is revised to emphasize the results for F-130 gage, downstream of the Tapia discharge.

Response to Comment 1-D20

The text referenced in the comment is incorrect. It should say "less than or equal to 0.1 cfs", not "with zero flow." The criterion for extreme low flow frequencies is set by the IHA methodology.

Consistent with the discussion under Comment 1-D13 through Comment 1-D20, the analysis shows that flow augmentation discharge to protect environmental species in Malibu Creek have a minimal impact on flows at the F-130 gage. LVMWD provided files that identify the flow augmentation discharges since 2000; after we subtracted these flows, there were no daily flows less than 0.48 cfs for the 2000-2010 period.

The text suggesting a connection between extreme low flows and ability of the system to purge itself of invasive species is removed.

Response to Comment 1-D21

The text in question is reworded to read "Extended flows into the dry season, in conjunction with reduced storage in the Lagoon, can result in problems with high water table and flooding during the summer." The text no longer implies that Los Angeles County is actively breaching the berm.

Response to Comment 1-D22

Conductivity measurements are used routinely in environmental applications as a fast and reliable way of measuring the ionic content in a solution (c.f. Gray, James R. 2004. Conductivity analyzers and their application, pp. 491-510 in Down, R.D; Lehr, J.H.. *Environmental Instrumentation and Analysis Handbook*. Wiley.) "High concentration of ions" is thus practically equivalent to elevated conductivity and we have focused on conductivity because that is the measurement most widely available. The potential role of individual ions is discussed further under comments Comment 1-D122 through Comment 1-D125.

Response to Comment 1-D23

For discussion on the selection of reference sites, please see Response to Comment 1-D5. For a more detailed discussion of all the different comparator/reference sites evaluated, please see section 7 and 8 of the TMDL.

Response to Comment 1-D24

The MCWMP LV1 and LA Co 16 stations were not used as BMI reference sites due to small sample size. Two BMI samples are available for MCWMP LV1 and 4 samples are available for LA Co 16 (see Response to Comment 1-D5).

Response to Comment 1-D25

USEPA was not able to obtain the National Park Service (NPS) water quality data in time for the draft TMDL report. Summaries of these data have now been inserted into Sections 7.1, 7.3, 7.4, and 7.5.

Response to Comment 1-D26

USEPA disagrees with the commenter that there are "major errors" regarding our analysis of DO samples at MC-1. The implication that low DO samples are from "stagnant pools" is incorrect. Some samples collected since 2008 were associated with zero flow records at the USGS gage but there was likely still the presence of hyporheic flow, which supported water in pools. A statement was added to the text in Section 7-1.

The implication that all low DO measurements are associated with zero flows is unsupported. First, since the USGS gage did not begin operation until December 2007, quantitative flow measurements did not exist not prior to this date. In addition, the following statement is incorrect: "Heal the Bay's data for this site showed that flow was not measured on the 14 dates with DO less than 7.0 mg/L" going back to 1999. Heal the Bay does not gage flow, but reports visual observations of flow conditions. Instead of asserting these are zero flows, our examination of MC-1 samples below 7 mg/L DO for 1999-2000 shows that five out of six samples are associated with an observation of "steady" flow and one with "intermittent" flow:

Heal the Bay DO Samples less than 7 mg/L in 1999-2000

Date	DO (mg/L)	Flow Condition
7/17/99	4.97	Steady
8/7/99	6.50	Steady
9/4/99	5.77	Steady
8/5/00	4.67	Steady
9/9/00	6.21	Intermittent
10/7/00	6.28	Steady

Only six out of 117 samples at MC-1 are associated with a flow condition of "none"; three of 117 samples are categorized as low flow year of 2009. Four of these six samples had DO concentrations greater than 8 mg/L.

In the TMDL, we concluded these DO grab samples are of limited value in assessing the full oxygen stress on the biota in the system because these are daytime grab samples that did not capture the diel

minimum DO levels. Consequently, observations of DO below the criterion during the daytime are a strong indicator of critical impairment conditions.

USEPA finds the suggestion to redo the analysis "by removing dissolved oxygen data from drying pools" to be highly infeasible and unnecessary. This is because flow data are only available at or near MC-1 and MC-15. Furthermore, DO levels below the criterion were observed during conditions of "steady" flow at MC-1, and at MC-15, which maintains perennial flow throughout the period of DO data collection. These data present valuable DO excursion observations: MC-15 DO levels were below the 7 mg/L criterion 12.7 percent of the time, and MC-1 DO levels were below the criterion 13.6 percent of the time.

Response to Comment 1-D27

There is no comment 27.

Response to Comment 1-D28

Significant amounts of additional data have been collected since the 2003 Nutrient TMDL. The TMDL reflects the updated findings and recent data.

Response to Comment 1-D29

Please see Response to Comment 1-D26. Flow gaging is not available at this MC-12. However, less than 10 percent of the observations are associated with reported visual assessment of "intermittent" or "trickle". According to the Basin Plan criteria for supporting applicable beneficial uses in these waterbodies, intermittent or trickle conditions are still highly relevant and should be considered. The minimum observed DO concentration of 2.6 mg/L on 6/7/2009 is highlighted to demonstrate that during conditions of "steady" flow, we would still observe excursions of DO levels; this was not related to "no flow or stagnant flow", as asserted by the comment.

Response to Comment 1-D30

As requested, a summary of DO monitoring data from the LVMWD-R13D station (co-located with MC-15), is included in Tables 7-1 and 7-2.

Response to Comment 1-D31

Table 7-1 is not intended to provide a comprehensive survey of DO data in the watershed; instead, this table is intended to present a quick overview of DO in the main stem. Information on other watershed sites is presented in Table 7-2.

Response to Comment 1-D32

USEPA does not dispute that the waterbodies are not perennial and agrees that conditions of limited or stagnant flow may precipitate blooms of algae and lead to large diurnal swings in DO concentration; but the Los Angeles Region's Basin Plan for DO criteria, assigned to the Malibu Creek Watershed streams, accounts for the intermittent and ephemeral nature of these waterbodies.

USEPA also agrees that poor diurnal DO conditions can occur during critical low flow conditions even if nutrient levels are relatively low. For this reason, the DO observations are considered a primary indicator of nutrient goals and DO is not identified as a major stressor of biota in the system.

Response to Comment 1-D33

Please see Response to Comment 1-D13. Although USEPA acknowledges that *surface* flow at the new USGS gage 11105510 is often zero during the summer period, this does not indicate that there is zero flow at this location. Instead, flow appears to be proceeding by hyphoreic pathways in the sand and gravel of the stream bed. USEPA finds the statement about ceased flows in the summer imprecise. *Surface* flows often cease, but other flows exist in the Watershed's hydrologic system.

Response to Comment 1-D34

Based on the summary provided, it appears that conditions are similar to those reported for Lunch Pool. Tunnel Pool results have been inserted in the TMDL.

Response to Comment 1-D35

USEPA agrees that some caution is needed in our interpretation of the continuous DO sampling. Based on the comment, the TMDL includes the difference between Start Pool and the other monitoring locations, and acknowledges the exact cause of extreme low DO in Start Pool are not well understood at this time.

Response to Comment 1-D36

The TMDL included the site-specific basis for translating between TDS and conductivity (LVMWD 2011). A screening level of approximately 2,500 µS/cm appears appropriate (21 percent of samples at MC-12 exceed this value).

Response to Comment 1-D37

The data in Table 7-3 are taken directly from the data records provided by Heal the Bay Stream Team. USEPA did not have access to the original field sheet entries and had no reason to reject any outliers. Furthermore, the average (i.e., mean; median) of these data is more informative than the extremes.

Response to Comment 1-D38

The TMDL includes the series of monitoring data available from Heal the Bay Stream Team, Tapia WRF, and NPS.

USEPA initially presented the Heal the Bay Stream Team data because it provides the longest time series record. Following the public draft of the TMDL, USEPA received a more comprehensive data set from LVMW. The TMDL includes the LVMWD results and references the LVMWD document for further details.

Response to Comment 1-D39

USEPA agrees that marine sedimentary rock can be a source of nitrogen. Nitrogen in such rock is generally present as kerogen (a recalcitrant organic form) and as ammonium silicate minerals. Both can be gradually released primarily by weathering to ammonium. However, LVMWD (2011) shows that the TKN level is high, but does not directly identify the nitrogen form as organic N. USEPA notes that available ammonium data do not show a clear indication of increased concentrations in undeveloped portions of the Monterey/Modelo Formation.

At this point, monitoring for total N and TKN is too sparse to be able to separate potential geologic and anthropogenic sources. The TMDL includes a discussion of these geologic and anthropogenic sources.

Response to Comment 1-D40

The TMDL is tasked to address impairment listings due to benthic macroinvertebrate bioassessments in Malibu Creek and benthic community effects in Malibu Lagoon. Nutrients, algae, sediment, and other stressors are investigated in our Stressor Identification to assess impacts on benthic communities. While we appreciate the information on the relationship of calcium enrichment to Cladophora mats and the role of halophilic diatoms, this information is only peripherally related to the scope of this TMDL. High nutrient levels, algal coverage, and light in Malibu Creek would likely result in excess growth of algae and concomitant impacts on benthic biota regardless of the specific details of the algal community structure.

With regards to the comments on nitrogen-fixing bacteria, it is the case that the diatom community includes species *capable* of fixing atmospheric nitrogen through symbiotic relationships with such bacteria. However, fixing atmospheric nitrogen is an energy intensive process. The ample supplies of inorganic nitrogen found in most regions of the Malibu Creek Watershed make it unlikely that bacterial fixation is a significant source of "natural" nitrogen in the system. Furthermore, it is not the intention of this TMDL to identify all sources of nitrogen, but instead, to determine if nutrient enrichment is a significant contributor to the impairment of benthic biota.

Response to Comment 1-D41

USEPA had presented seasonal nutrient analyses in Table 7-6, Table 7-8, and Table 7-9. In addition, Table 7-6 is expanded to show averages for the discharge and non-discharge season for 2005-2010. The TMDL also references LVMWD (2011) for further details.

USEPA agrees and noted in the Draft TMDL that concentrations of inorganic N downstream of Tapia are lower in the non-discharge season. However, MCWMP sampling of total and dissolved forms of nitrogen demonstrates that algal growth and nutrient uptake appear to be shifting between inorganic to organic forms of nitrogen during the summer . This would suggest the importance of understanding the ramifications of nutrient loading accumulated during and between seasons, and nutrient cycling's impact on the benthic biota.

Response to Comment 1-D42

USEPA agrees that concentrations of nitrate N downstream of Tapia are lower in the non-discharge season. See Response to Comment 1-D41.

Response to Comment 1-D43

The goal of analyzing nutrient concentrations at reference sites in the Watershed is to determine the potential range of concentrations that may be achievable given the constraints of climate, soils, and geology. USEPA's assessment of all potential reference sites indicated that some disturbance is impacting LV1 and LA County 16; these sites showed nitrate N concentrations higher than other tributaries draining the Monterey/Modelo Formation. However, the TMDL includes a summary of LVMWD's (2011) analysis of nutrient concentrations by region of the watershed (please also see Response to Comment 1-D38).

Stein and Yoon (2007) suggest that nutrient concentrations in some southern California "natural" streams are higher than the USEPA-proposed eco-regional nutrient guidelines for the country. An important premise of the CA Nutrient Numeric Endpoint (NNE) framework being developed by the State Board is that site-specific nutrient targets should not be set lower than natural conditions. Therefore, our evaluation of natural conditions is important.

USEPA observed that median concentrations of orthophosphate as P concentrations at undeveloped sites draining the Modelo/Monterey Formation are higher than the 0.1 mg/L target in certain conditions. The TMDL discusses these observations and in response, sets representative loading capacities.

Response to Comment 1-D44

USEPA appreciates the JPA for correcting the error associated with the interpretation of orthophosphate results from Heal the Bay. Heal the Bay Stream Team's data did not clearly indicate that these were reported as mass of HPO_4, and not mass as P. All tables and graphics in Chapter 7 are corrected to show results as P.

Response to Comment 1-D45

It is not unexpected that the Monterey/Modelo Formation rock show total phosphorus content as higher than the phosphate fraction, particularly since phosphorus is a common mineral. Much of the phosphorus contained in rock will be present in relatively insoluble forms, such as apatite. Particulate mineral phosphorus complexes are gradually weathered to bioavailable orthophosphate, which is the only component of direct concern for eutrophication and concomitant impacts to the benthic biota. Since total phosphorus measurements in Malibu Creek are limited, USEPA finds it is appropriate to analyze and focus on the available measured orthophosphate concentrations; these show elevated levels in the Monterey/Modelo Formation regions of the watershed.

Response to Comment 1-D46

Heal the Bay orthophosphate samples are converted to mass as phosphorus (see Response to Comment 1-D44).

Response to Comment 1-D47

The TMDL does not dismiss evidence of elevated nutrient concentrations at MCWMP station LV1. The text is clarified to describe the noted concentrations. Furthermore, the TMDL reports data observations from other locations showing lower nitrate-N concentrations often observed in streams draining the Monterey/Modelo Formation. The comment cites NPS nitrate-N concentrations up to 0.80 as evidence of variability in undisturbed sites within the Monterey/Modelo Formation. However, the maximum concentration at LV1 is 6.13 mg/L, which is far higher than any of the NPS sites. Consequently, LV1 is

described and presented, but not included as a comparator/reference site. Please see Response to Comment 1-D48.

The Draft TMDL concluded that inorganic N is a small fraction of total N at the *comparator/reference* sites. This conclusion is not applied at the Los Angeles County gage site or at the LVMWD sites that are downstream of the Tapia discharge.

Response to Comment 1-D49

The TMDL considered seasonal variation in its analysis and presented seasonal averages for applicable data. Furthermore, the TMDL includes loading capacities, wasteload and load allocations to address the seasonal variability observed in the Watershed.

Response to Comment 1-D50

This comment appears to contain contradictory statements. In response to the commenter's submittal of relevant information for Malibu Creek Watershed and request for more intensive review of the effects of Monterey/Modelo Formation in the Watershed on the benthic community, USEPA comprehensively evaluated the available data in the Watershed and the potential of this geologic formation to result in elevated concentrations of the various forms of the nitrogen compounds. The commenter states that USEPA incorrectly interpreted the conclusions of the LVMWD (2011) report that "Surface water monitoring does not indicate elevated nitrate levels in streams draining the Monterey/Modelo Formation." However, the comment continues "what the report does include are suggestions that the Monterey/Modelo Formation is capable of yielding elevated nitrogen compounds."

We beleive the commenter is trying to assert that there is a difference between examining "the direct measurements of urban runoff" and instream water quality data, with those measurements "running directly off of both weathered and freshly exposed areas of Monterey Formation rock". USEPA evaluatedall of the available data pertaining to the assessment of the impact on the benthic community and those critical stressors responsible for the harm. To more directly analyze whether the Monterey/Modelo Formation results in naturally or unnaturally elevated nutrient concentrations, we examined the available nutrient data, physical habitat data and the benthic community scores in Malibu Creek and the tributaries directly feeding into the main stem. We were able to select out representative comparator/reference sites that had the Monterey/Modelo Formation without adjacent anthropogenic impact. We believe this more appropriately reflect the exact biological, physical and chemical conditions experienced by a benthic organism. In separating out the multiple lines of data for sites only downstream of Monterey/Modelo Formation, sites only downstream of urban activities, and sites downstream of mixed Monterey/Modelo Formation and urban activities, data showed that the largest impact on the benthic community condition were related to human related activities. This was particularly highlighted by the very low TN concentration at a site located downstream only of the Monterey/Modelo Formation.

Response to Comment 1-D51

In USEPA's analysis of the available data for the main stem and the tributaries, it was necessary to consider and assess all the available data and all monitoring sites. To best determine the relative differences between sites impacted and not impacted by anthropogenic activities, we examined the water quality, physical habitat and benthic community condition scores between sites in/adjacent to urban development and/or Monterey/Modelo Formation and those reference or reference-like sites not influenced from urban development and Monterey/Modelo Formation.

USEPA does not agree that sites, such as those in upper Cold Creek, are not valuable as reference sites for assessing urban loads in areas tributary to Malibu Creek. In fact, it is important to examine water quality from sites both with urban development and Monterey/Modelo Formation geology, and sites only with urban development. In our analysis of all the sites, where we compared the water quality and biological condition of sites that covered the different land uses, we observed that sites with both urban development and Monterey/Modelo Formation geology resulted in lower condition and higher nutrient concentration versus sites that were only located within the Monterey/Modelo Formation regions, suggesting that sites with both urban and Monterey/Modelo Formation influence are distinguishable from sites only in Monterey/Modelo Formation. This is informative because it suggests that geologic formations in Monterey/Modelo regions may not, at least consistently, result in elevated nutrient compounds, as the commenter asserts.

Response to Comment 1-D52

USEPA did not receive the National Park Service nutrient data in time for inclusion in the Draft TMDL, but has incorporated the nutrient data in the final TMDL.

Response to Comment 1-D53

Suggested change has been added to the TMDL.

Response to Comment 1-D54

USEPA disagrees with the comment, the "TMDL omits data and analysis of data for ionic strength and analysis of any effect conductivity and ion concentrations might have on macroinvertebrate community composition." USEPA did not omit any such data for consideration or evaluation. In our search and compilation of the available data, we did not find much data or information specifically on the analysis of ion concentration and macroinvertebrate community composition for Malibu Creek Watershed. We reviewed and considered all the data available for Malibu Creek Watershed, including the very limited data on toxicity tests, and the submitted data from LVMWD on the major ions concentrations. However, there was no specific study in the Malibu Creek Watershed examining the relationship between these ion concentrations and benthic macroinvertebrate community composition, particularly at genus levels.

The TMDL considers toxicity testing because such testing is an appropriate method for evaluating the potential impacts of stormwater discharge as well as other toxics, including pesticides. The TMDL uses the results of toxicity tests in combination with conductivity and measured concentrations of potential toxic substances to evaluate toxicity as a stressor. The results of toxicity tests therefore present one line of evidence in a total weight-of-evidence approach. The TMDL applies the results of toxicity tests using *Ceriodaphnia dubia*, an ubiquitous freshwater invertebrate and standard test organism, to the evaluation of stressors in the Malibu Creek watershed. Tests using marine organisms (*Strongylocentrotus purpurataus*, purple sea urchin) apply to the evaluation of stressors in Malibu Lagoon.

USEPA acknowledges that Brown and Bay (2005) interpreted the results of their toxicity tests as indicating sulfate and other dissolved salts as the source of toxicity, and this finding is described in the TMDL (Section 9.5). However, USEPA believes that toxicity is not a primary stressor in Malibu Creek, based on the facts that toxicity is not consistent in space or time and that the proposition that low IBI scores are associated with toxicity from elevated sulfate is only weakly supported.

Furthermore, the USEPA study referenced in the comment (Pond et al. 2008) regarding West Virginia's Central Appalachian coal mining streams provided interesting correlations, but it is challenging to extrapolate this specific study's findings to Malibu Creek Watershed. Specifically, Malibu Creek

Watershed does not experience impact from mountaintop coal mining activities; Malibu Creek Watershed is in a completely different ecoregion and experiences highly unique and distinct climatic patterns, geology, precipitation, hydrology, flow structure and pattern, and different biological community composition that has adapted to different natural conditions than those found in West Virginia's Central Appalachian watersheds. Pond et al. (2008) specifically designed the study to examine sites downstream of mining activities and sites not experiencing mining activity; this scientific design is distinct from the commenter's statements and requests, which would require a different scientific design to examine whether these elevated ion concentrations are due to natural conditions, and likely would or would not impact the natural benthic community composition. Because of these significant differences, it was not appropriate for USEPA to compare the condition and situation in Malibu Creek Watershed with that of the Central Appalachian watersheds.

USEPA does not disagree that further understanding of the relationship between the various forms of ion concentrations and benthic macroinvertebrate community should be conducted. However, this should not detract from the large body of data collected over 15-20 years on water quality, physical habitat, and benthic community in the Watershed that provides evidence of impairment due to the critical stressors. We recommend that further investigation of these relationships can elucidate the specific impacts from the multiple types of ion compounds, whether natural or anthropogenic, on the chemical quality and biological community in the Malibu Creek waterbodies.

In Section 8, USEPA presents results of biological measurements in comparison with a multitude of water quality parameters. Cause and effect (aka stressor identification) occurs in Section 9. USEPA agrees that ion concentrations, especially sulfate and selenium, are naturally elevated in waters draining the Monterey/Modelo Formation. The text on pages 8-1 through 8-44 have been updated, as has relevant text in Section 9.

The TMDL is based on the consideration of the evidence: 1) that the benthic macroinvertebrate community in Malibu Creek has adapted to high conductivity water; 2) the observation of unimpaired IBI scores at sites within the Monterey/Modelo Formation; and 3) limited observations of toxicity that might be attributable to elevated salts. Combined, these observations indicate that natural conditions may be a contributing stressor, but not the primary stressor resulting in impaired biology.

Response to Comment 1-D55

USEPA reviewed and evaluated all known available data for the Malibu Creek Watershed. Unfortunately, there were very limited data and existing studies on ionic impacts on the algal diatom community in the Malibu Creek Watershed. USEPA could not report or analyze data that were not available or completed before the Draft TMDL was completed. We find it encouraging that LVMWD was able to determine that some diatom samples indicate high ionic content, and also show that some of these halophilic diatoms, common to Malibu Creek, show partiality for brackish waters with elevated sodium and sulfate concentrations. However, USEPA does not understand how this information on diatoms would be contradictory to the Draft TMDL's general conclusions. In fact, this very limited information, purely on the type of diatoms, suggests these species would do better in Malibu Creek Watershed because of their natural adaptability to elevated ion concentrations.

The commenter stated that the use of the biological indicators is not appropriate for this watershed. However, USEPA examined multiple reference sites in Malibu Creek Watershed and did not find that the southern California metrics for biological indicators is inappropriate. In particular, the presence of the Monterey/Modelo Formation is not unique to the Malibu Creek Watershed, and is present in many California watersheds (including Monterey County, Kern County, Santa Barbara County, Ventura County, Orange County). Furthermore, the reference set collected for the Southern California IBI includes over 200 sites all over southern California, with some of those located in the Monterey/Modelo

Formation. Finally, the Final TMDL incorporates the most updated reference model, completed by Southern California Coastal Water Resource Group on behalf of the Statewide effort to develop Bio-Objectives for California. This reference model includes over 1600 reference sites collected in California.

Response to Comment 1-D56

The issue of slope and potential issues in applying the SC-IBI to low gradient sites is already discussed in Section 8.1.3. The estimates of slope, based on a DEM, should be considered as approximate only, as actual field survey or high-resolution LiDAR is needed for accurate Thalweg slope determination.

The comment presents a figure showing that SC-IBI scores in Los Angeles County are positively correlated with slope. This correlation is noted, but does not necessarily show causation. SC-IBI scores in Los Angeles County have also been shown to be higher at higher elevations and higher for unlined than for lined channels. Because both these factors likely correlate with slope, the causal mechanisms are uncertain.

Response to Comment 1-D57

USEPA used the information from applying the southern California IBI as a line of evidence in our overall assessment of the condition in the Watershed. The benthic macroinvertebrate data collected for Malibu Creek Watershed was sampled only during periods of flow and in wadeable streams, as required under the wadeable streams collection method. This wadeable streams method is used widely in California, Arizona, and Nevada, which experiences varying ranges of perennial and non-perennial flows. In all cases, if the method is used in wadeable streams, then the macroinvertebrate, periphyton, or algal biomass samples are applicable and have been incorporated into different regional Indices of Biotic Integrity. Please see California's Surface Water Ambient Monitoring Program's report on "Assessing Southern California's streams" (2009) which used the Southern California IBI multi-metric approach to evaluate stream condition (http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/assesshealthsocalstreams.pdf).

Furthermore, the TMDL described total phosphorus as the second highest risk stressor and total nitrogen as the seventh highest risk stressor to southern California streams.

USEPA Region IX has participated in the statewide effort to develop Bio-Objectives for California and is on the Regulatory Workgroup in addition to participating actively at the Scientific Steering Committee meetings when the development of the different methodologies. Due to the parallel timing of the development of this TMDL and the State Bio-Objectives, USEPA provided the best available information and analyses at the time it public noticed the Draft TMDL on December 12, 2012. Since December 2012, USEPA has received the completed reference model from the statewide Bio-Objectives effort and has completed updated analyses and calculations. The Final TMDL includes results from using the updated O/E model and the multimetric index of biological community structure.

With regards to the literature statements, 57a-f, USEPA finds these are relevant statements and not inconsistent with the findings in the Draft TMDL. In fact, a few of the statements support our conclusions, such as statement 57e, which observed that adult invertebrates, such as Coleopterans and Hemipterans, are often more abundant and diverse in intermittent streams. Malibu Creek Watershed main stem and tributaries experiences a range of flow regimes and have shown to have abundant and diverse benthic community composition in certain, less impacted, regions of the watershed.

Response to Comment 1-D58

The Final TMDL includes results from using the updated O/E model and the multimetric index of biological community structure. Please see Response to Comment 1-D57.

Response to Comment 1-D59

USEPA obtained Heal the Bay's bioassessment and water quality data by contacting the organization directly and also by downloading the data directly from their Stream Team's Data Portal website (http://streamteam.healthebay.org) which provides the complete list of water quality and bioassessment data. We believe we have received the appropriate data, which are publicly accessible. USEPA recommends that the commenter ask for clarification directly from Heal the Bay.

Response to Comment 1-D60

Station identification numbers have been clarified in the TMDL. According to the Heal the Bay Stream Team, MC-9 is co-located with the later MC-15 station. The TMDL includes benthic macroinvertebrate results for MC-9 and are available in the data sheets provided by the Heal the Bay Stream Team.

Response to Comment 1-D61

The comment claims that "all the scores listed here are incorrect." Perhaps the commenter is not aware that the Los Angeles County bioscores are reported on a 0 – 70 scale. These scores have been renormalized to a 0 – 100 basis for comparison to results provided by Heal the Bay Stream Team, LVMWD, and others.

Table 8-4 does not show results after 2008 because LA County switched to randomized stations in 2009, described in the text preceding the table. Because these are single samples, they cannot provide confirmation of whether the result is an anomaly or consistent with other measurements over time.

Response to Comment 1-D62

The LVMWD SC-IBI scores shown in Table 8-6 are taken directly from a table labeled "LVMWD IBI Scores Adjusted (100 scale)" contained in an Excel spreadsheet entitled "LVMWD IBI Scores 2006 to 2011_07.25.2012.xls". This table was provided to USEPA TMDL team by email from Karin Patrick, Senior Biologist and Data Quality Manager, Aquatic Bioassay & Consulting Laboratories on July 25, 2012. This data transfer from LVMWD's contractor was arranged by Jan Dougall at LVMWD. We have rechecked the spreadsheet, and the scores shown in Table 8-6 match exactly. Thus, we did not observe any "errors" in this table, unless LVMWD's contractor supplied incorrect data.

Response to Comment 1-D63

Comment noted. Additional site details are included in the TMDL.

a, b, c. USEPA sampled at sites that met the requirements of California's Surface Water Ambient Monitoring wadeable streams protocol.

d. USEPA provided description of the data results and noted similar patterns observed in the TMDL. Sites were selected based on identifying sites that meet SWAMP's wadeable streams protocol and randomly selecting sites along the main stem of Malibu Creek, Malibu Creek State Park, and upstream of the LVMWD discharge point.

e. Our Stressor Identification analysis and review of data and multiple lines of evidence show that other stressors are contributing to the low IBI scores. We recommend that a more targeted and specific monitoring design should be developed to elucidate the relative contribution of elevated conductivity and certain ion species.

Response to Comment 1-D64

USEPA consulted with State Board's Technical Steam on development of Statewide Bio-Objectives, and the state has *not* "rejected" the SC-IBI approach (Personal Communication, Ken Schiff, SCCWRP). The southern California Index of Biotic Integrity approach is a multi-metric index (MMI) approach that evaluates the functional attributes of the benthic community composition. The state still maintains the use of an MMI approach in its current development of statewide bio-objectives. The primary difference is the use of an updated reference model that includes a larger number of reference sites and use of independent predictor variables (e.g., precipitation, geology, etc.). The Final TMDL includes the updated O/E and pMMI model, as developed by the Science Team at the Southern California Coastal Water Resources Program. Analysis of data sets typically requires calculating an average of multiple data points. The median was selected as a measure of central tendency of the data to minimize the uncertainty caused by outliers in the data set that may be due to chance variations in data collection or temporary sources of disturbance, such as fire impacts.

Response to Comment 1-D65

Please see Response to Comment 1-D43. The text at the end of Section 8.1.3 has been augmented to include a discussion of the results at Heal the Bay LV-9, MCWMP LV1, and LACo-16 in the context of comparator/reference sites.

We observed that the specific conductivity at all these sites in the Modelo Formation is approximately double than those observed in the lower Malibu Creek main stem. If conductivity/ionic strength is limiting on biology, we would expect to see conductivity having a lesser impact in the main stem. However, the data does not support this and instead illustrate that other sources and stressors are impacting the benthic community.

Response to Comment 1-D66

USEPA disagrees with the commenter. USEPA's guidance "Establishing Site-Specific Aquatic Life Criteria Equal to Natural Background" (1997) defines approaches, methods, and processes to establish and support a particular parameter in a specific region as maintaining "natural background concentration". Neither the commenter nor the state has conducted a specific analysis and detailed documentation supporting the establishment of site-specific criteria. This action requires a standards modification from the state and USEPA, and must undergo strict documentation, including a targeted monitoring design, review, and approval by the state and USEPA. USEPA is not aware of any parameters that have undergone this basin plan amendment request for action and subsequent USEPA approval. In this TMDL, USEPA completed its review of the best available data and geographical information, and identified reference sites as those sites that are not adjacent to or draining from anthropogenic related land use activities. This is an appropriate scientific approach in identifying impacted and non-impacted sites.

Response to Comment 1-D67

USEPA agrees there is variation in scores at individual sites. Because of this reason, our comparisons are completed using those sites with a minimum of five reported scores to provide more robustness to calculated averages.

The intent of the discussion is to explore the data in support of evaluating potential causes of impairment and biological potential, not to establish whether there are statistically significant differences between individual stations. In fact, the different stations show a gradient of results with multiple overlaps. The box and whiskers (interquartile) range is more informative than the scatterplot. We note that only one score at CH-6 falls into the "poor" category.

The Mann-Whitney means test, often referred to as the Wilcoxon Rank Sum test, is a non-parametric test for shift in location between two populations. It maintains a null hypothesis that the populations from which the two data sets have been drawn have the same mean. For small sample sizes, the confidence limits can be quite large. The comment shows that the null hypothesis cannot be disproved (at an unspecified level of confidence). This result does not indicate the means are the same, but rather that they cannot be proved to be different with the currently available data.

Response to Comment 1-D68

The MCWMP raw taxa data were used in the Draft TMDL's O/E analysis. This final TMDL recalculated the O/E analysis using the CSCI Southern California model. In the process, we have rechecked the original data sources and incorporated any previously missing data.

Response to Comment 1-D69

Please see Response to Comment 1-D64 above. We observed differences between the sites included in the comment. For a detailed discussion on the CSCI results for each site and the predictor variables used, please see Section 8 of the TMDL. For the comment on perenniality, please see Response to Comment 1-G7 and 1-D57.

Response to Comment 1-D70

USEPA agrees that in general, EPT taxa may be sensitive to conductivity. The partial quote in the comment is taken out of context. The complete sentence states that the observed lowered EPT taxa at this site may be due to high conductivity; however, the SC-IBI score remains high due to acceptable scores on other components of this multimetric index.

Response to Comment 1-D71

USEPA agrees that elevated conductivity is associated with lower bioscores, although fair SC-IBI bioscores are observed and attained within the Monterey/Modelo Formation. The intent of Figure 8-9 is to show that conductivity is one of many factors controlling bioscores, as is noted in the comment.

The presentation provided in the comment using only undeveloped sites does elucidate the role of conductivity more clearly and has been incorporated into our report. However, we note that the regression on undeveloped sites also demonstrate that, even at the highest conductivity sites, it is possible to obtain an SC-IBI score in the fair (non-impaired) range. The existing Figure 8-9 is retained because it demonstrates clearly that the Malibu Creek main stem sites have lower IBI scores than would be expected from conductivity alone.

Response to Comment 1-D72

USEPA disagrees with the comment. USEPA acknowledges that conductivity/ionic strength may limit bioscores in some instances, it is not the sole cause of impairment (see Comment 1-D71). The evidence shows that non-impaired SC-IBI scores *can* be obtained even in the areas with the highest specific conductivity. The statement in 72a is not true: the sites noted as downstream of high-density development are "all…also downstream of the Modelo/Monterey Formation". As an example, site TR-17 shows specific conductivity concentrations similar to comparator/reference sites, but shows the lowest median SC-IBI scores.

Regarding 72b, the intention is to highlight sites *downstream* of high density development as a potential source of pollutants or other stressors, and not to imply that the watershed upstream of a given site is predominantly developed.

USEPA readily acknowledges that sites have large interannual variability (72c). Individual measurements can be affected by events such as unusual weather, fire, or localized disturbances. For these reasons, we analyzed sites with a minimum of 5 samples and computed medians. This is informative because the median is robust against influences by anomalous results. The scattergram presented in the comment is less informative.

Response to Comment 1-D73

Figure 8-11 of the Draft TMDL provided one part of a comprehensive analysis evaluating the relationship between SC-IBI and average nitrate concentrations monitored in the Watershed. USEPA did not conclude that average nitrate concentrations were the sole stressor that explained the observed biological condition. The text associated with Figure 8-11 concluded that nutrient impacts is one critical factor impacting benthic community health, but not the only factor. We noted the elevated nutrient concentrations downstream of developed areas, which also may explain the lower bioscores. In response to the comment that "this analysis is better done by sample, rather than by site", we are not certain of the commenter's recommended data analysis. In general, this graph provides one of the many lines of evidence considered in this TMDL and USEPA made its determination based on the total body of evidence.

Response to Comment 1-D74

USEPA disagrees with this comment. The TMDL does *not* conclude that elevated conductivity is due solely to stormwater input. Instead, the TMDL stated that conductivity may enter Luce's regressions in part as a surrogate for urban stormwater. Please also see Response to Comments 1-D71 and 1-D72 above.-

Response to Comment 1-D75

Correlations to percent sedimentary geology were included solely because this is a predictor in the earlier O/E models. Since the Draft TMDL, USEPA has updated the information previously reviewed. USEPA removed the discussion of correlation to sedimentary geology and the two associated figures have been removed from the TMDL.

USEPA finds the figure provided in the comment (plotting median SC-IBI versus fraction Monterey/Modelo Formation) unconvincing and not informative. The strength of the correlation is primarily due to the inclusion of stations with zero Monterey/Modelo Formation drainage and higher SC-

IBIs. For all other sites, the median SC-IBI was not correlated with fraction Monterey/Modelo Formation.

Response to Comment 1-D76

USEPA discussed the possible confounding interpretations due to the co-occurrence of impervious areas and Monterey/Modelo Formation geology. However, USEPA finds that both sets of correlations are relevant, particularly because the R^2 for the correlation to percent imperviousness is higher than that for correlation to conductivity. The correlation to percent imperviousness appears to explain better the low SC-IBI scores at the Malibu main stem than does the correlation to specific conductivity. Furthermore, analysis of the CSCI bioscores support these findings.

Response to Comment 1-D77

Please see Response to Comment 1-G8.

USEPA reviewed the Biggs (2000) report and the statement that enhanced algal growth may occur in watersheds with Tertiary marine sedimentary formations. The commenter overemphasized Bigg's finding. Biggs (2000) mostly described that "in areas with geology that is very high in certain mineral compounds or catchments near the coast that might be subjected to salt spray, the conductivity-nutrient ratio breaks down and much higher nutrient supply may be indicated than occurs." This statement does not support the commenter's assertion these thresholds would not be met in catchments with significant amounts of Tertiary marine sediments.

USEPA disagrees with the comment that the Monterey/Modelo Formation is a significant portion of the Malibu Creek Watershed. The Monterey/Modelo Formation, which includes marine shale and sandstone, shale, siltstone, shale, and clay shale, covers only 16.4 percent of the watershed area. Our assessment of the data reviewed in Malibu Creek Watershed showed inconsistent information with regards to the impact of the Monterey/Modelo Formation on different monitoring sites in the Watershed. This is particularly highlighted by observations of good biological condition in the unimpacted Monterey/Modelo Formation areas.

Response to Comment 1-D78

Luce (2003, p. 5) states "Information was needed on how sunlight and nutrients affect periphyton in Malibu Creek, where an intact riparian canopy provides shade for much of the stream." USEPA agrees that the paraphrase of this statement was unclear; we removed the cited sentence to prevent confusion. Of note, Luce (2003) showed reduced canopy cover at some, but not all of the impacted sites.

Luce (2003) concluded (p. 119 that "The data indicate that periphyton cover is related to nutrient concentrations in the water, and less strongly related to canopy cover, while the degraded biotic community is related to canopy cover, substrate embeddedness (sedimentation) and conductivity in the water. Both of these problems are therefore related to runoff flows and discharges to the creek, and to riparian vegetation on the creek banks." Thus, periphyton (which is the subject of this section) is not strongly related to canopy cover.

Unfortunately, detailed information on canopy cover at other places and times is limited. USEPA addresses the potential impact of canopy cover on the biotic community in more general terms by evaluating reduced habitat quality due to sedimentation effects and channel alteration. In presenting the information, USEPA is not dismissing canopy cover, but highlights the uncertain and limited information related to canopy cover at this time.

Response to Comment 1-D79

The potential effects of light availability, canopy cover, and flow depth on algal biomass are discussed in detail in Appendix F.

Response to Comment 1-D80

Please see Response to Comments 1-D75 and Comment 1-D76.

Response to Comment 1-D81

For clarification purposes, the statement in the Draft TMDL was referring to the 2003 Nutrient TMDL limits. In the final TMDL, USEPA clarified the statement and explained that the body of evidence demonstrates that lower in-stream nutrient limits are needed to support a healthy benthic macroinvertebrate community. Data since 2003 show that although the 2003 Nutrient TMDL limits have been achieved in parts of the Watershed, the algal coverage and related response variables continue to impair the waterbody, and thereby impacting the benthic macroinvertebrate's physical and chemical habitat. Please also see Response to Comment 1-D77.

The comment supports USEPA's overall conclusion that stressors other than nutrients also contribute to algal growth in Malibu Creek.

Response to Comment 1-D82

USEPA agrees that it is important that the Los Angeles Count MS4 permit was adopted. This TMDL is addressing the impacts to benthic macroinvertebrates in Malibu Creek and benthic community impacts in Malibu Lagoon. Because these impairments address different beneficial uses (WARM, COLD, WILD, RARE) than those identified in the 2003 Nutrient TMDL, this TMDL evaluated all the relevant data, stressors, and causes that could potentially impact the benthic macroinvertebrates and benthic community.

The 2003 Nutrient TMDL for Malibu Creek Watershed addressed nutrient compounds that "exceed the water quality objectives (WQOs) for ***nuisance*** effects such as algae, odors, and scum (RWQCB, 1996)" (USEPA 2003). Specifically, the 2003 Nutrient TMDL addressed depressed dissolved oxygen and excess nutrient loads that resulted in "nuisance" impacts to recreational uses, including the negative visual and odorous presence of scum and algae. The 2003 Nutrient TMDL did not address the beneficial use impairment linked to benthic macroinvertebrates. For these reasons, and because the 2003 Nutrient TMDL wasteload allocations have been achieved in many instances, lower in-stream loading capacities are established to protect benthic macroinvertebrate and community.

Response to Comment 1-D83

USEPA recognizes that the Heal the Bay Stream Team algal coverage measurements are different than Busse's chlorophyll *a* density measurements. For this reason we did not compared these data in the TMDL.

The algal coverage data results collected by the Heal the Bay Stream Team are valuable because they represent the only measures of benthic algal density consistently collected following the establishment of the 2003 Nutrient TMDL (LVMWD's macroalgal cover data appears to stop in 1999).

USEPA disagrees with the statement that "visual estimates are notoriously unreliable." Although individual estimates may have uncertainty, the averages and consistent long term trends provide robust

and valuable information. Table 8-13 includes a footnote indicating that the estimates are based on visual observations.

USEPA agrees with the recommendation that the SWAMP Algae SOP should be followed in future monitoring.

Response to Comment 1-D84

The station location has been modified to "Malibu Creek above Las Virgenes Creek" for consistency with the station location identified in Table 8-1.

Response to Comment 1-D85

The comment referenced one of the Draft TMDL's statements, which concluded that there is a lack of correlation between individual measurements of mat algal cover and contemporaneous inorganic nutrient concentrations. USEPA acknowledges that this statement is confusing and may be misleading. To clarify, we note that this relationship is not particularly informative due to a large amount of noise present; the noise can be attributed to algal density's dependence on nutrient availability during the preceding weeks. In other words, algal density is not only correlated to the contemporaneous concentration, but also influenced by conditions prior to the day of the algal density measurement. USEPA reanalyzed the data and calculated averages, which showed a substantially stronger correlation between average mat algal coverage and average inorganic N concentration ($R^2 = 40\%$). The TMDL includes this revised information.

It is well established that algal densities in streams are often better predicted by total nutrient concentrations, rather than inorganic nutrient concentrations (e.g., Dodds et al., 1997, 2002, 2006; Biggs, 2000b). These papers are referenced in the TMDL. Furthermore, stronger correlations to total nutrient concentrations occur because inorganic nutrients are often recycled rapidly back into algal biomass, while organic fractions continue to degrade and supply additional inorganic nutrients to support growth.

USEPA agrees that additional analyses using total nitrogen and total phosphorus collected simultaneously with reliable algal biomass and percent cover measurements would be valuable; however, such data are not available at this time.

Response to Comment 1-D86

USEPA disagrees with the commenter's interpretation of Stein and Yoon's (2007) study on water quality and loads from natural catchments in Southern California Streams. The conclusion of Stein and Yoon (2007) stated that although "neither chlorophyll-a concentration nor algal percent cover was significantly correlated with any nutrient concentrations" in their study of dry weather events, "the lack of correlation may be due to the narrow range of low values observed for both algae and nutrients at the natural sites. In addition, the study concluded that the limited correlation between algal biomass and nutrients are due to multiple limitations of the study: few sampling events conducted during dry weather, and a lack of continuous sampling throughout the year to capture representative changes in algal community and biomass. The study's algal cover values were compared with literature values typically associated with eutrophic conditions. The mean algal biomass of 147 mg/m^2 at the natural sites was slightly lower than the algal nuisance threshold of 150 mg/m^2 stated in USEPA's Nutrient Criteria Technical Guidance Manual for Rivers and Streams (2000). This suggests that the algal biomass levels observed in the natural sites of the Southern California streams are within the national algal nuisance threshold recommended by USEPA.

Response to Comment 1-D87

The statement referenced in the comment was a summary statement and was not solely referring to the Busse et al. (2003) data. This summary statement has been clarified to indicate that it considered all analyses presented in that section.

Response to Comment 1-D88

USEPA completed a comprehensive CADDIS assessment for the Malibu Creek Watershed. Our Stressor Identification Analysis evaluated the available data on invasive species; the majority of the data were primarily for the New Zealand Mudsnails, which may be niche competitors for native species of benthic macroinvertebrates. As to the analysis of potential predator invasive species (e.g., fish, birds, amphibians) on the native benthic macroinvertebrates, limited data were available to evaluate specific predation impacts on the benthic macroinvertebrate community. Consequently, due to insufficient information at this time, USEPA did not include this in our Stressor Identification/CADDIS.

USEPA supports future CADDIS development with stakeholder participation during the Regional Water Quality Control Board's implementation of the TMDL and implementation plan. Unfortunately, due to the time constraints, USEPA could not incorporate full stakeholder participation, which would have taken more than 12-18 months time to complete (this estimate is based on the experience of other cases where a full stakeholder participation was completed, such as the CADDIS Case Studies completed in Southern California as part of the Statewide Biological Objectives efforts). USEPA finds that the current Stressor Identification/CADDIs was sufficient and provided valuable information and linkages between the benthic macroinvertebrates and the associated stressors and causes. USEPA believes that the CADDIS approach is always useful and more information and stakeholder support can improve upon the findings and provide new efforts to support areas with insufficient information.

Response to Comment 1-D89

USEPA showed that only one quarter of Brown and Bay's samples showed any toxicity. Please also see Response to Comments 1-D72 through 1-D77. The referenced comment is incorrect (Please see Response to Comment 1-D74). USEPA appropriately discussed the issue of potential toxicity in the TMDL.

Response to Comment 1-D90

The speculation regarding volatile organic chemicals is referenced from LA County's annual monitoring reports; this is not USEPA's conclusion. We observed low frequency of detection of volatile organic chemicals. To screen for other potential stressors of aquatic life, wet and dry weather water quality data collected at the Malibu Creek Mass Emissions Station (S02) was compiled from October 2003 through March 2010. We compared available toxic constituent data to chronic (Criterion Continuous Concentrations, or CCC) and acute (Criterion Maximum Concentrations, or CMC) water quality benchmarks or criteria. Because a CCC benchmark for sulfate and a CMC benchmark for diazinon do not currently exist, calculation of percent exceedances was not possible for these constituents. A 30-day CCC exists for ammonia, which is calculated as a function of water temperature, but not recorded. The results are presented in the table below.

Percent Exceedances of Acute and Chronic Benchmarks at Malibu Creek Mass Emissions Station – Select Constituents, 2003 – 2010

Constituent of Interest	Percent Exceedance of CMC (%)		Percent Exceedance of CCC (%)	
	Dry	Wet	Dry	Wet
Ammonia	0	0	0	0
Cyanide	5	0	21	6
Diazinon	NA	NA	5	2
Sulfate	53	51	NA	NA
Total Aluminum	0	0	0	0
Total Beryllium	0	0	0	0
Total Cadmium	0	2	0	4
Total Copper	0	4	0	9
Total Lead	0	0	0	4
Total Nickel	0	0	0	0
Total Selenium	0	0	63	53
Total Zinc	0	2	0	2

Excursion frequencies are low for most constituents which are consistent with the TMDL listing decisions. Impairments associated with frequent excursions of the selenium and sulfate criteria are listed for TMDL development.

Response to Comment 1-D91

USEPA agrees that the Monterey/Modelo Formation regions in the Malibu Creek Watershed may show higher specific conductivity levels and some ion species concentrations. However, a closer examination must be conducted to evaluate the distinction between natural and anthropogenic loadings of certain metals and sulfate species before concluding that local urban runoff loads are not a significant source.

Response to Comment 1-D92

USEPA disagrees with the comment. In our comprehensive evaluation of the data and information for this watershed, USEPA considered all variables; this included the completion of a Stressor Identification analysis where all stressors and causes were evaluated against the available data. This assessment followed USEPA Guidance Document on CADDIS, in addition, to following recommendations by the statewide Bio-Objectives development efforts.

We disagree with the commenter's conclusion that the reference site selection was inadequate. Please see Response to Comment 1-D5.

Response to Comment 1-D93

USEPA appreciates the JPA's list of possible stressors. USEPA has considered low flows and altered flows as part of altered hydrology (B1). Additionally, USEPA has modified the text for toxicity stressor (A4) to explicitly include elevated salt concentrations (concentrations of the major ions contributing to

conductivity), since this phrase was inadvertently omitted in the draft document. The draft TMDL currently addresses conductivity as a potential stressor. Conductivity can be used as a surrogate measure for toxic salts, but on its own does not provide conclusive evidence of toxicity. Conductivity measures the overall electrical conductance of a solution, but does not provide specific indication of the toxicity of the ions responsible for increased conductance. In the Malibu Creek watershed, the long-standing presence of naturally-elevated ion concentrations resulting from the underlying geology would likely have resulted in changes to community structure prior to the watershed's development. As described in comment 1-D54, USEPA concluded that increased conductivity appears to be a contributing stressor, but not the primary stressor resulting in impaired biology.

USEPA finds thediscussion of altered hydrology sufficiently addresses the issue. USEPA finds that summer drying and summer pools should not be separately identified as stressors. Based on observed gage data, USEPA acknowledges that *surface flow* at USGS gage 11105510 is often zero during the summer. However, this does not indicate that there is zero flow throughout the Malibu Creek watershed. Flow appears to be proceeding by hyporheic pathways in the sand and gravel of the stream bed. Many benthic macroinvertebrates can withstand reduced surface flow through adaptations that confer desiccation resistance, by aestivating, or by migrating. Therefore, benthic macroinvertebrates that are already adapted to summer drying conditions would not likely be affected by reduced summer surface flows.

USEPA agrees that predation by invasive species, especially red swamp crayfish, bullfrogs, and mosquitofish might be a potential stressor, but no data were available to evaluate the presence of bullfrogs or mosquitofish, and only limited data (five observations) are available for red swamp crayfish in the biological data set provided by multiple organizations. The text discussing invasive species as a potential stressor has been modified to address this possible concern.

USEPA reviewed data for organophosphorus pesticides in the Malibu Creek watershed from the Brown and Bay (2005) report. The Los Angeles County West Vector and Vector-Borne Disease Control District's website (http://www.lawestvector.org/mosquito_control.htm) indicates that the District does not use mosquitofish (*Gambusia affinis*) in streams. Instead, they treat streams with *Bacillus thuringiensis* var. *israelensis* (Bti) or methoprene. The text in section 7.6 has been modified to address the District's vector-control agents.

Response to Comment 1-D94

USEPA clarified the conclusions of the Luce (2003) study. Luce did establish a strong relationship between algal cover and nutrients. Below we provide the relevant conclusions from Luce's (2003) study:

"Multiple regressions of periphyton cover with nutrients, canopy cover and substrate size indicated nutrient concentrations were most often related to periphyton cover, with canopy the next most important factor after nutrients. Nutrient concentrations in the water and percent cover of periphyton were lower at reference sites than at impacted sites. The diversity and sensitivity of the benthic macroinvertebrate (BMI) community were lower at sites impacted by urban runoff…" (p. ix)

"The impacted sites had higher nitrate concentrations than the reference sites… , Periphyton cover was also higher at impacted sites than at reference sites, in both dry and wet seasons…All the reference sites had lower mean periphyton cover than all the impacted sites in both dry and wet seasons, except for reference site R9, which had periphyton cover comparable to some of the impacted sites." (pp. 21-23)

"Conductivity, embeddedness and canopy cover were the factors most commonly related to BMI metrics" and "Nutrients were not important in general." (pp. 54 and 60). However, "unimpacted reference sites had greater species richness and higher proportions of sensitive taxa." These reference sites also had lower nutrient concentrations and lower periphyton cover. Thus, BMI measures are

inversely correlated with both nutrient concentrations and periphyton cover in Luce's data; however, other measures provided stronger correlations. These results do not necessarily indicate that nutrients and periphyton are not important to evaluating overall benthic macroinvertebrate condition. We note that the measures of benthic macroinvertebrates and nutrients represent different timescales. Benthic macroinvertebrates are considered an integrator of multiple variables and a water quality indicator covering a longer time period as opposed to nutrient measurements, which represent the condition collected at a snapshot in time. Consequently, conducting correlation analysis of these two measures may not be appropriate because of the different timesteps inherent in the measures. Instead, it is more informative to evaluate interlinked relevant variables, such as periphyton, sediment, etc."

In addition, USEPA has conducted further data analysis and found good correlation between average total inorganic N concentration and average mat algae cover. The following figure now appears in Section 8.3:

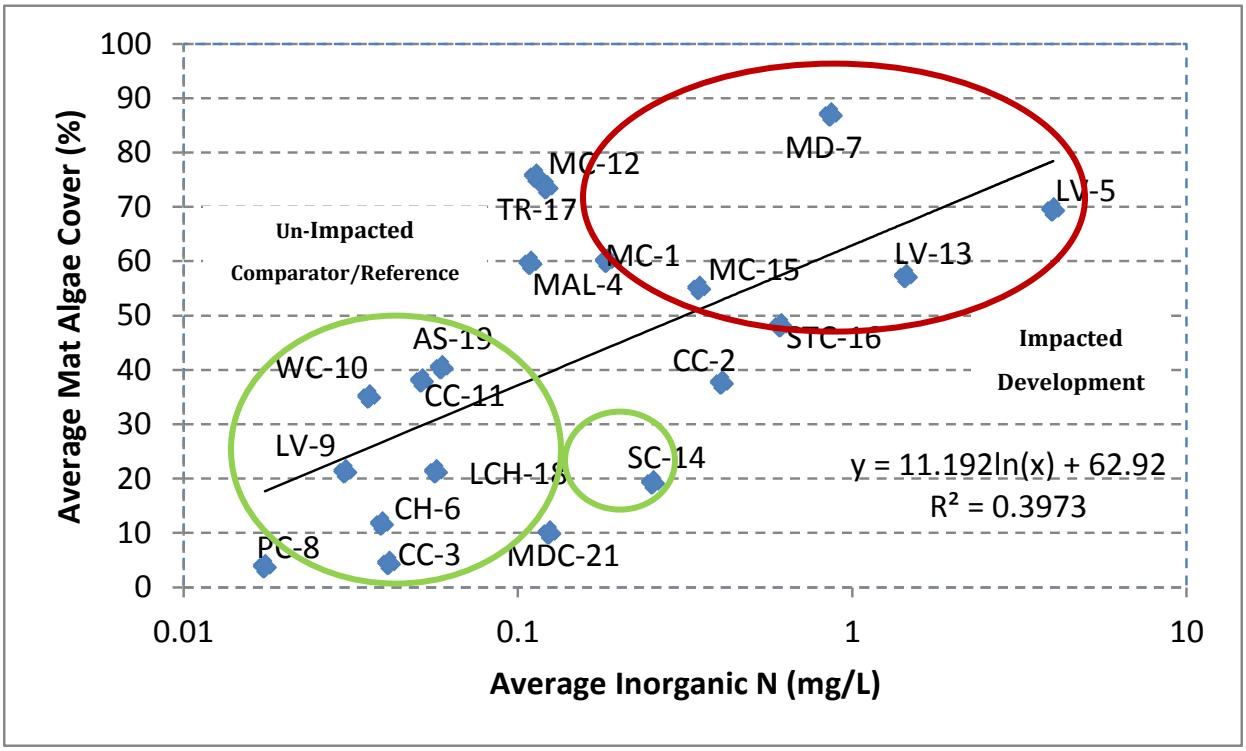

Figure 8-25. Correlation between Average Mat Algae Coverage and Average Inorganic Nitrogen Concentrations in HtB Stream Team Data during the summer growing season ((April 15 – November 15). Green circle shows the clusters of the un-impacted and comparator/reference sites. Red circle shows the cluster of the impacted sites

USEPA further disagrees with the commenter's interpretation of Stein and Yoon's (2007) study on water quality and loads from natural catchments in Southern California Streams. Please see Response to Comment 1-D87 for a detailed discussion.

Impacts resulting from excess nutrients and algal growth are complex and frequently cannot be clearly demonstrated with a simple linear regression between two factors. Sufficient additional evidence, from the Malibu Creek watershed supports the linkage between excessive algal growth and impacts to the benthic macroinvertebrate community; this includes multiple lines of evidence and statistical methods of

analyses. USEPA has expanded the text in sections 8 and 9 to more clearly illustrate the conclusions drawn regarding algal growth.

Response to Comment 1-D95

USEPA agrees that some algal growth can benefit benthic macroinvertebrate communities by providing a food source and, in the case of macroalgae, suitable habitat for some benthic macroinvertebrates. However, excessive algal growth presents far more potential impacts than benefits. The text on page 9-4 has been modified to address the fact that moderate algal growth may benefit benthic macroinvertebrate communities.

The comment correctly points out that the TMDL does not consider the potential thermal insulation benefit of instream algal cover for steelhead trout. Since this TMDL is directed at impacts on benthic macroinvertebrates, the discussion of impacts and benefits to steelhead trout falls outside the scope of the document.

Response to Comment 1-D96

USEPA finds that further complicating the diagram would not be informative. As a result, only the most important of the recommendations contained in this comment have been included:

- Arrow from Natural Geology to Organic Toxics: Not included as the intent of "organic toxics" is to represent pesticide/herbicide affects that are not associated with Natural Geology.
- Arrow from Natural Geology to Elevated Nutrients has been added.
- Arrow from Natural Geology to Elevated TSS and Turbidity has not been added as the intent of the latter box was to address elevation relative to natural conditions.
- Ionic Strength has not been added as a proximate stressor as it is presumed to be approximately covered under the Elevated TDS box.
- Non-perennial Flow has not been added as a proximate stressor because, to the extent that it is not natural, it is covered under Altered Hydrology. However, an arrow has been added from Flow Regime to Excess Algal Growth.
- Pesticide Treatments has not been added as a proximate stressor because it is covered under the Organic Toxics box.

Response to Comment 1-D97

USEPA disagrees with the comment and finds that the comment inaccurately states the information. The 2003 Nutrient TMDL for Malibu Creek Watershed stated that "excess algal growth does not appear to affect DO concentrations in the creek." This statement was made in the absence of diurnal monitoring data and refers to evidence from daytime grab samples. Algal mats are expected to have an effect on diurnal DO, resulting in excess DO during sunlit period of photosynthesis and depressed DO during overnight respiration. This effect is observed in the continuous DO monitoring from Lunch Pool.

Response to Comment 1-D98

The text under A4 states "occasional water column toxicity has been reported" and that stormwater "often has elevated toxicant concentrations." USEPA finds there is no conflict between these statements. Please also see Response to Comments 1-D54 and 1-D89.

Response to Comment 1-D99

USEPA agrees that elevated salt concentration or "ionic strength" may be a contributor to potential toxicity in Malibu Creek. The TMDL includes an expanded discussion.

It is important to note that the body of evidence demonstrates that ionic strength alone is not sufficient to result in impaired benthic macroinvertebrate assemblages. Specifically, both SC-IBI and pMMI bioscores show relatively good condition at stations CH-6 and LV-9, which are stations with the highest specific conductivity values; these sites provide valuable information because they are located in the Monterey/Modelo Formation, upstream of development and other potential anthropogenic stressors, and yet demonstrate comparatively good water quality and biological condition.

Response to Comment 1-D100

USEPA included the comment as requested earlier. The text on pages 9-6 and 9-7 discussing altered hydrology has been modified to incorporate changes made to Section 6 in Response to Comments 1-D13 through 1-D21, specifically to clarify the sources of year-round flow in Malibu Creek and to Malibu Lagoon. Additionally, the discussion of Altered Hydrology has been expanded to ensure agreement with any changes made in Section 6.

Response to Comment 1-D101

The comment says that "this section misses the most substantial channel alteration in the Malibu Creek main stem – 120-foot Rindge Dam." The TMDL states "The major alterations to the channel of Malibu Creek and its tributaries have been the creation of several lakes or impoundments." Discussion of the potential effects of dams and/or lakes is provided in the final TMDL. USEPA did not find it necessary, for purposes of this TMDL, to discuss Rindge Dam in detail.

Response to Comment 1-D102

We thank the JPA for providing watershed-specific information on fire management and fire frequency and have included the additional information in the TMDL.

Response to Comment 1-D103

USEPA considered the comments offered on the causal pathway summary and accepted several suggestions:

a. Reduced habitat quality from excess algal growth is now noted as potentially exacerbated by the modified exposure of natural geology in the watershed (B7).

b. Reduced DO is now linked to altered hydrology leading to stagnant conditions (B1).

c. Elevated salt concentrations is now listed as a potential cause of toxicity

Item (d) in the comment is a quote from the CADDIS guidance that does not require a specific response.

Response to Comment 1-D104

USEPA finds that sedimentation and excess nutrients leading to excess algal growth and reduced habitat quality are the two proximate pollutant stressors of greatest concern for this TMDL. Therefore, we address the questions regarding temporality for these two stressors.

With respect to sedimentation, Ambrose and Orme (2000) present a detailed history of the development around Malibu Creek and Lagoon. According to their report, the watershed was dominated by ranching between the 1860s and 1920s, increasing erosion rates. Additionally, the Topanga-Las Virgenes Resources Conservation District (1989) estimated an average rate of sedimentation in Malibu Lagoon of 10 cm/yr in 1983—nearly ten times the rate that would have occurred in pre-European settlement periods. The TMDL does not indicate the relative contribution of sediment to the Lagoon from Malibu Creek, but Malibu Creek is expected to contribute the largest proportion of sediment load to the Lagoon.

Algal coverage has also increased over time. Plotting algal cover between 1999 and 2011 as a moving average shows increases in floating and mat algal coverage at MC-1, and mat algal coverage at MC-12 over time. Multiple sources have estimated the seepage of septic tanks into Malibu Lagoon, including an estimated rate of 500 acre-feet per year (Topanga-Las Virgenes Resources Conservation District 1995) and a more recent estimate that recharge from onsite wastewater disposal systems in the Malibu Civic Center area contributes about 300 acre-ft/yr (McDonald Morrissey 2010). Estimated existing nutrient loads are presented in Section 5.2.2.

Please also see Response to Comments 1-D32 with regards to DO and perenniality.

Response to Comment 1-D105

The rapid filling of the Rindge Dam pool by 1949 does NOT demonstrate *excess* sedimentation. Instead, this primarily shows that sedimentation rates are naturally high in this watershed. Some corrections are made in the TMDL, however, our assessment of flow and results of the IHA demonstrate that changes in the flow regime have significantly increased sedimentation in the watershed. In fact, the naturally high sedimentation rates shown by the filling of the Rindge Dam pool helps demonstrate the high sensitivity of the Malibu Creek Watershed to increased runoff from urban impervious surfaces.

Response to Comment 1-D106

USEPA disagrees with the comment that the TMDL uses Heal the Bay's Stream Walk data to support a finding of sedimentation impairment. The comment is also incorrect when it states that Heal the Bay's GIS data show no fine sediment alteration in the entire length of the Malibu Creek main stem. According to Table 2-3 in Sikich (2013, p. 43), Heal the Bay reports that 3.8 of 9.8 mapped miles of the Malibu Creek main stem (39%) is impacted by excess fine sediments. Sikich et al (2013) also reports that 62% of the 987 streambank modifications that were mapped were degraded or failing altogether. Failure of these modifications can be expected to result in increased erosion and sedimentation. USEPA cannot identify the source of the commenter's claim that bank modifications constitute 16% of the length of the creek.

Response to Comment 1-D107

USEPA disagrees with the comment. USEPA obtained and reviewed all available annual bioassessment reports from both LVMWD and LA County. The final TMDL includes a description of the data sources assessed (Appendix A) and an inventory of reports reviewed (Appendix E).

The 2005 MCWMP report is cited specifically in this section to reference a relevant quote from the report. The commenter is aware of USEPA's assessment and discussion of physical habitat data from a variety of sources, as discussed in this TMDL.

Response to Comment 1-D108

In the final TMDL document, USEPA clarified the evidence on the impairment due to sedimentation, including additional analysis of the existing data and presenting the data considered in our earlier assessment. Other studies and source data sets are referenced and presented, where applicable. Finally, the CSCI bioassessment scoring tools are also evaluated in relationship to sedimentation and indicators of sedimentation. Please see Sections 7, 8 and 9 of the TMDL for more detailed discussion on sedimentation.

Response to Comment 1-D109

Suggested change has been made to the referenced paragraph and subsequent table.

Response to Comment 1-D110

Please see Response to Comments 1-D48 and 1-D85.

Response to Comment 1-D111

USEPA disagrees with the comment. USEPA concluded that seasonality is an important consideration and thus, the TMDL presented the data in Malibu Creek seasonally. Please see our Response to Comments 1-D2, 1-D41, and 1-D49.

USEPA agrees that concentrations below Tapia are much lower during the non-discharge season. However, the revised version of Table 7-6 now shows that concentrations of nitrate-N at MC-12 (upstream of Tapia) are substantially lower than the concentrations downstream of Tapia during both the discharge and non-discharge seasons. This is in contrast to the statements made by the commenter.

Response to Comment 1-D112

USEPA presented additional analyses to explain and describe the naturally complex linkage between benthic community condition and nutrient stressors. We also worked with SCCWRP on beta testing their reference models for the California State Condition Index, which provided additional lines of evidence to describe the observed impairment conditions and explain the primary pollutant stressor variables that can be addressed.

USEPA disagrees with the comment that excess algal growth is not related to nitrogen concentrations. First, it is well established and discussed in earlier comments and in the TMDL, that algal growth is controlled by a variety of factors including nutrient concentrations, light availability, scour and grazing, water velocity, and other factors. Elevated nutrient concentrations are a necessary, but not sufficient basis for excess algal growth. Second, while inorganic nitrogen concentrations are lower at MC-12 and MC-1 they are still elevated compared to reference sites and likely exceed the concentration needed to significantly limit algal growth. Third, inorganic nitrogen by itself is not always an adequate measure of the nitrogen available to support algal growth because of the rapid uptake by algal biomass; in addition,

correlations of algal density to total nitrogen are often stronger than correlations to inorganic N (see Comment 1-D85).

Please see Response to Comment 1-D86. The conclusions from Stein and Yoon (2007) are taken out of context and do not support a broad conclusion that algal density is unrelated to nutrient concentrations.

Response to Comment 1-D113

USEPA disagrees with the comment. Please our Response to Comments 1-D2, 1-D41, and 1-D49. A discussion of seasonal averages is provided in Section 7 of the TMDL.

Furthermore, elevated nutrients during the winter season are likely to result in elevated residual concentrations in the summer. Analysis on a seasonal basis confirms that nitrogen concentrations in the listed reaches of lower Malibu Creek are elevated in both the summer and winter (see Response to Comment 1-D111).

Response to Comment 1-D114

The referenced statement refers to the nitrate N target at MC-1, not the watershed as a whole. Monitoring at MC-1 since 2005 shows limited excursions of the discharge season target and limited excursions of the non-discharge season target. Please see Tables 7.7 to 7.9 for details. The sentence is revised to "Although the 2003 Nitrogen TMDL limits appear to have been largely achieved at the downstream station MC-1, the algal density targets have not."

Response to Comment 1-D115

The referenced text is presented as an observation of correlation; USEPA does not attribute a causal relationship in the context of that paragraph.

Response to Comment 1-D116

USEPA accepts the comments that gas exchange may be suppressed at some places and times in Malibu Creek. To improve clarity, USEPA removed the referenced paragraph. Furthermore, the TMDL also further explains that generally acceptable pH and DO levels do not preclude adverse impacts on biota when associated with eutrophication.

Response to Comment 1-D117

The commenter offers no counter-evidence to refute the finding that "median IBI scores greater than 30 only occur at sites with average nitrate-N concentrations less than 1 mg/L." The fact that sites with lower average nitrate concentrations do not achieve a median SC-IBI score of 30 does not contradict evidence of the role of nutrient enrichment in impacting biological condition (i.e., bioscores); these sites may be affected by other stressors.

Please also see Responses to Comments 1-D72 through 1-D76.

Response to Comment 1-D118

USEPA disagrees with the comment. The commenter misstates the referenced statements; the TMDL does not assert that nitrate itself directly impairs macroinvertebrate health in Malibu Creek. Our analysis found a correlation between inorganic nitrogen concentration and benthic macroinvertebrates. Please also see Response to Comment 1-D86, 1-D111, and 1-D112. As discussed previously, the findings of Stein and Yoon are misinterpreted in the comments.

Response to Comment 1-D119

USEPA disagrees with the comment. Specifically, USEPA disagrees that cumulative impacts from the Tapia discharge should be dismissed (see Response to Comment 1-D120). Please also see Response to Comment 1-D112.

Response to Comment 1-D120

USEPA disagrees with the comment. Nutrient concentrations during the non-discharge season downstream of Tapia remain elevated relative to the upstream station MC-12 (see Response to Comment 1-D111). This is a potentially significant factor because it has implications for the watershed's ability to achieve targets through the control of current sources.

The majority of nutrients released by Tapia may likely be flushed to the lagoon and ocean. However, there are a number of reasons to suspect that there are some effects that persist into non-discharge periods, including

- Storage of nutrients in the hyporheic zone and shallow alluvial groundwater,
- Uptake by algal mats that persist from the discharge into the non-discharge season,
- Uptake by rooted vegetation that is subsequently returned to the stream as leaf fall.

These potential contributors are important considerations when evaluating the total nutrient balance in the stream, and should not be entirely dismissed. In particular, it is important to consider the cumulative impacts over time even by other less defined contributors. We note that nutrient loading into Malibu Lagoon would result in storage of nutrients in the low gradient, depositional areas, which could seriously impact the very sensitive estuarine habitat.

The observation that the time series evaluation "showed no summer season increases over time" is not relevant to this discussion point.

Response to Comment 1-D121

USEPA disagrees with the comment. The commenter's assertion that nutrient levels are not linked to algal cover is contrary to basic principles of plant physiology. Please see Response to Comment 1-D112 for further discussion.

Response to Comment 1-D122

Please see Response to Comments 1-D54, 1-D55, 1-D72, and 1-D99.

Item (b): USEPA agrees that high ionic concentrations draining the Monterey/Modelo Formation headwaters *may* have the potential to extirpate species that have not adapted to these conditions. However, the long-standing presence of naturally-elevated ion concentrations resulting from the underlying geology would likely have resulted in changes to community structure prior to the watershed's

development. Please see Response to Comments 1-D7b and 1-D99. The predictive MMI (pMMI) model utilizes several measures of ionic concentration in rock, which can be expected to correlate with background ionic concentration in surface water. The pMMI therefore predicts site-specific metrics based on the background geology observed in the Malibu Creek watershed. Using this new method, reference sites in the Malibu Creek watershed attain acceptable pMMI and CSCI scores, typically close to 1. Site LV-9, in the Monterey/Modelo Formation, also achieves near reference conditions for the pMMI and CSCI scores in most years.

Regarding the citations contained in this comment, USEPA agrees that salinity gradients may have an effect on macroinvertebrate community structure and survival. However, none of these references addresses macroinvertebrate communities in Southern California. To ensure the TMDL considers, as much as possible, watershed and region specific data and studies, these references were not included in the TMDL.

Response to Comment 1-D123

USEPA is familiar with the CADDIS guidance on ionic strength, included in the TMDL, and agrees that ionic strength can be associated with sub-lethal impacts on macroinvertebrate communities.

However, USEPA finds the following statement incorrect, that "the draft TMDL author's reliance on toxicity test results in discounting impacts from high ionic strength ignores strong counterarguments found in USEPA's own guidance documents". See also Response to Comments 1-D54 and 1-D122.

Response to Comment 1-D124

The Draft TMDL's paraphrasing of Luce's (2003) findings is not intended to imply that orthophosphate is a significant contributor to ionic strength. Instead, Luce's study pointed out the co-occurrence of elevated phosphorus and high conductivity pointed; she inconclusively stated that this may be due to a geological source. The reference to phosphorus is removed to prevent misunderstanding.

The TMDL does not imply that elevated sulfate concentrations are due to urban runoff.

Response to Comment 1-D125

Please see Response to Comment 1-D54.

Response to Comment 1-D126

The TMDL completed an assessment of the impaired condition to date based on the available data in the Watershed. USEPA acknowledges additional comparator/reference sites would be valuable to have, but may be challenging to find. In fact, the State of California found it difficult to identify a large number of reference sites, particularly in areas near development.

However, the TMDL identified several largely undisturbed reference sites within the Malibu Creek watershed characterized by conductivity in excess of 3,000 µS/cm (notably CH-6 and LV-9). These comparator/reference sites provided valuable information and appropriately represented the site-specific characteristics observed in Malibu Creek Watershed.

The fact that site CH-6 is able to obtain unimpaired SC-IBI scores in almost all samples suggests that ionic strength is not the sole, if at all, cause of impairment in the watershed; we note that Malibu main stem sites exhibited much lower conductivity levels and yet, reported poor to very poor bioscores.

USEPA rejects the conclusion that the lack of reference sites is "affecting virtually all of its findings on both the evidence for impairment and its conclusions on probable major stressors." Furthermore, USEPA recognizes conductivity as one of many plausible stressors that may contribute to reduced bioscores in the Malibu Creek watershed. Please see also our Responses to Comments 1-D5 and Comment 1-D99 [?] .

Response to Comment 1-D127

Please see Response Comment 1-D65.

Response to Comment 1-D128

USEPA agrees with the comment that the SC-IBI is not sensitive to dominance by the New Zealand mud snail. USEPA disagrees with the second part of the comment which speculates that SC-IBI may have other unspecified weaknesses for application to Malibu Creek. Our analysis of the CSCI scoring tool's O/E and pMMI methods for Southern California help to address these concerns. Please see Response to Comment 1-D93.

Response to Comment 1-D129

Comment noted. Changes to the TMDL have been made in response to the other referenced comments.

Response to Comment 1-D130

Comment noted. USEPA added clarification to the status of flows from Malibou Lake to Malibu Lagoon.

Response to Comment 1-D131

Referring to Comment 1-D106 of this Comment Letter, this TMDL addressed sedimentation due to a sedimentation listing in the CWA 303(d) Impaired Waterbody Listing for the Los Angeles Region. The listing and evidence of sedimentation are based on data and information collected previously, and based on our evaluation and modeling completed under the Indicators of Hydrologic Alteration (IHA) analysis. Please see Section 2 under Basis of Listing and Section 6 under IHA of the TMDL for more detailed discussion.

Response to Comment 1-D132

The sentence in question has been altered to read "reference sites are likely not impacted by *increased sedimentation relative to natural conditions* where the riparian buffer is intact and there has been little change in impervious cover."

Response to Comment 1-D133

Please see Response to Comment above 1-G10. We disagree with the commenter's conclusion of Sikich et al.'s reported data and assessment. The Sikich et al. draft (2012) and final (2013) report showed quantitative measures of channel alteration, including miles of streams disturbed by various indicators of physical habitat impacts (e.g., erosion, stream modification, etc.).

Response to Comment 1-D134

The text has been changed to state that "LVMWD (2011) suggests that total N concentrations in the watershed are naturally elevated in the watershed due to the Monterey/Modelo formation." See also Response to Comment 1-D50.

Response to Comment 1-D135

Comment noted. The text has been changed to state that orthophosphate concentrations in the main stem are significantly higher than concentrations at reference sites outside of the Monterey/Modelo Formation.

Response to Comment 1-D136

USEPA is not rebutting LVMWD's finding that PO_4-P is elevated in the Monterey/Modelo Formation headwaters. Instead, this section explores the potential additional contribution from urban stormwater. We removed the statement that inorganic P concentrations are higher in Monterey/Modelo Formation sites downstream of development because this is not true in all cases. Variability between Monterey/Modelo Formation undisturbed sites is noted and may be due to local differences in ionic composition of the rock, or channel bank stability and erosion rates.

Response to Comment 1-D137

Please see Response to Comments 1-D54 and 1-D122.

Response to Comment 1-D138

Based on revisions and additional data received during the comment period, we have revised the Strength of Evidence scoring.

a. The comment states that it "is uncertain what degree of algae growth or habitat availability there was in the pre-development era." While it is true that no data are available for the pre-development era, plotting algal cover between 1999 and 2011 as a moving average shows increases in floating and mat algal coverage at MC-1, and mat algal coverage at MC-12 over time.
b. USEPA disagrees with the comment that the biological evidence is "not strongly supportive." In fact, evidence for the biological gradient is strong. Both nutrient concentrations and mat algal coverage are higher in Malibu Creek than at reference sites, and nutrient concentrations correlate with increased mat algal growth during the growing season and with decreased biological scores.
c. USEPA disagrees with the statement that there is "no evidence showing that algal cover or biomass has any correlation with macroinvertebrate measures," and has added further analysis to the text to better demonstrate the relationships between nutrients, algal cover, and macroinvertebrate measures.
d. USEPA has included additional data and analysis for the strength of evidence evaluation for excess algal growth causing reduced habitat quality and benthic macroinvertebrate impairment."

Please see Section 9 of the TMDL for more detailed discussion.

Response to Comment 1-D139

USEPA considered data by Heal the Bay, which includes both mat algae coverage and floating algae coverage.

Response to Comment 1-D140

USEPA provided biological threshold action levels in this TMDL. The recommendation regarding final Statewide Biological Objectives policy is included in Section 11 of the TMDL.

Response to Comment 1-D141

Please see Response to Comment 4-1 below.

Response to Comment 1-D142

Please see Response to Comment 1-D140 above.

Response to Comment 1-D143

The recommendation regarding final Statewide Nutrient Numeric Endpoint Objectives policy is included in Section 11 of the TMDL.

Response to Comment 1-D144

USEPA considered the use of nine reference sites, but following additional information on each site, we reduced the comparator/reference sites based on the following criteria: located in unimpacted area; representative of site-specific characteristics of the Watershed; have consistent data sets from which to evaluate and compare the data. For a detailed discussion, please see Section 7 and 8 of the TMDL.

Response to Comment 1-D145

Comment noted. Please see Response to Comment 1-D7.

Response to Comment 1-D146

The draft NNE Framework states that targets should not be set less than natural background. This TMDL did not use the NNE to set targets or allocations. Since the State Board is currently still developing the NNE Framework, this TMDL considered the relevant NNE information as part of the assessment effort and responded to stakeholder requests to consider the NNE Tool.

Response to Comment 1-D147

USEPA considered the comments on phosphorus limits and consequently are clarifying the in-stream nutrient concentration target limits and those limits that would be applied to the dischargers.

Response to Comment 1-D148

Comment noted.

Response to Comment 1-D149

USEPA obtained data from the National Park Service and included it in our assessment in the final TMDL.

Response to Comment 1-D150

Comment noted. USEPA provided more clarification of the waste load allocations for Tapia WWTP. Specifically, the wasteload allocations include the in-stream nutrient limits which are expected to be achieved in the receiving water. Furthermore, USEPA also expanded details on the assimilative capacity of the point source effluent discharge and provided more guidance on the interpretation of the in-stream limits to a permit discharge limit.

Response to Comment 1-D151

Comment noted and alternative option is added to the recommendations.

Response to Comment 1-D152

Comment noted and recommendations are included.

Response to Comment 1-D153

Comment noted and recommendations are included.

Response to Comment 1-D154

Comment noted and recommendations for expanded algae monitoring is included.

Response to Comment 1-D155

USEPA incorporated modified O/E, MMI and the combined CSCI scores and analyses in the final TMDL.

Response to Comments on the Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments

December 12, 2012 Public Notice

July 2, 2013

RESPONSE TO COMMENTS

This document includes USEPA's response to comments submitted in response to the December 12, 2012 Public Notice of the Draft Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments. The comment letter submitted is provided on USEPA Region 9's website with highlighted comment notations added to the original letter at the end of each comment to identify the comment number (e.g., USEPA is responding to the specific comment immediately above the numbered "Comment" in red bold). Any change that is made to the TMDL in response to the comments is indicated in the response. If no change is noted in the response, then no change was deemed necessary in the TMDL. Please see (http://www.epa.gov/region9/water/tmdl/progress.html) for individual comment letters.

2. Santa Monica Bay Restoration Commission

Response to Comment 2-1

See Response to Comment 5-3 below.

Response to Comment 2-2

Comment noted. USEPA recalculated the averages of the comparator/reference sites which are located in unimpacted regions or downstream of undeveloped areas. The recalculated means resulted in a slight modification to 0.65 mg/L TN for the summer period. To account for the variability of wet weather events and other natural sources during these wet weather events, we set 1.0 mg/L TN for the winter period. Furthermore, this winter loading capacity is supported by ranges observed at comparator/reference sites.

Response to Comment 2-3

See Response to Comment 5-3 below. Based on the submitted information, the benthic community diversity goal to maintain minimum species diversity was modified to 40. USEPA believes that 15 years is an appropriate timeframe in which to expect the restoration of the benthic community diversity, particularly due to the recent restoration efforts in Malibu Lagoon. We expect that the full effect of the restoration efforts will take time due to the variability of climate, precipitation and other natural events.

Response to Comment 2-4

Comment noted and correction is included in the TMDL.

Response to Comment 2-5

USEPA is establishing these TMDLs by identifying the appropriate loading capacity, sources, and wasteload and load allocations. The State has the implementation authority of the TMDL. USEPA recommends the commenter consult with the Los Angeles Regional Board during the development phase of the Implementation Plan to address the relevant issues related to the removal of Rindge Dam. See also Response to Comment 5-1 below.

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3. Surfrider Foundation

Response to Comment 3-1

Comment noted. See Response to Comments 8-1 and 8-2 below.

Response to Comment 3-2

Comment noted. USEPA understands that general plans and efforts are in development to remove Rindge Dam in the future. In the event that Rindge Dam is removed, USEPA recommends the state to evaluate the potential influence this may have on Malibu Creek Watershed. If appropriate, the State may need to reconsider the TMDL and consider any potential effects on the benthic macroinvertebrate community following the removal of the Dam.

Response to Comment 3-3

See Response to Comment 8-6 below.

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4. CASA & Tri-TAC

Response to Comment 4-1

We disagree with the commenter's statement that technical experts have "resoundingly rejected" the use of SC-IBI scoring tool (Personal Communication, Ken Schiff). USEPA has been in discussion and consultation with the SWCRB Biological Objectives Science Team throughout the development of this TMDL. We understood from the Science Team that SC-IBI is another appropriate tool to assess biological condition (Personal Communication, Ken Schiff). The Index of Biological Integrity is a scoring tool that assessed the unique nature of the southern California region, where the Monterey/Modelo Formation is present in many regions of southern Californian coastal watersheds. In fact, scientists and resource managers continue to use the IBI as an effective means of assessing the benthic macroinvertebrate condition in many parts of the nation. We agree that additional reference sites specific for the Malibu Creek Watershed could be included. In an effort to ensure the most up to date information and analysis are provided, USEPA conducted substantial efforts to update the TMDL by including the California Stream Condition Index (CSCI): CSCI, O/E, and pMMI bioscores. These bioscores provide additional lines of evidence and consider the local characteristics of Malibu Creek Watershed, including elevation, gradient, precipitation, and geology. The results from these CSCI bioscores are comparable to the SC-IBI and demonstrate the impairment of benthic macroinvertebrate community in the Malibu Creek main stem and tributaries. Furthermore, we examined two reference sites in adjacent coastal subwatersheds, with comparable elevation and gradient as those in the Malibu Creek main stem. These results also demonstrate the impaired condition of the main stem and the main tributaries.

This TMDL did not rule out the invasive species, New Zealand mudsnails (NZM). We included an assessment of this invasive species in the Watershed. Based on the general scientific knowledge, we find this invasive species as potentially causing harm to the benthic macroinvertebrate community in Malibu Creek Watershed. However, we did not observe or find direct evidence of the NZM causing an impact to the benthic macroinvertebrate community in the Watershed. We agree that the SC-IBI may not be specifically capturing the negative impact of the NZM, however, this does not necessarily suggest that the

SC-IBI is flawed as a tool for evaluating overall condition. The IBI focuses on identifying the functions of the macroinvertebrates and evaluating whether these functions are different than what is expected from a benthic macroinvertebrate community that is not impacted by anthropogenic activities. For example, it specifically identifies species that are pollution tolerant and pollution sensitive. It is may be the case that the habitat taken over by the invasive species was habitat already occupied by pollution tolerant species prior to NZM introduction. This is evidenced by the fact that prior to 2006 (when NZM were observed in Malibu Creek Watershed), the IBI scores were already poor, reflecting the observed impact to the benthic community in the Watershed. With that said, USEPA recommends further detailed study of invasive species, such as NZM, in the Malibu Creek Watershed, which could further examine the specific and direct impact of the NZM.

USEPA completed a detailed Stressor Identification, examined multiple lines of evidence, including multiple biological condition scoring tools, with consideration of the gradient, geology, and precipitation in Malibu Creek Watershed, and analyzed all relevant variables (e.g., physical habitat, water quality, etc.). With this body of evidence and the consideration of the consistency of the data over a period of 15-20 years, it would be unreasonable to dismiss the data. USEPA based its determination on the preponderance of the information evaluated and assessed to date, which includes the CSCI, O/E and pMMI scoring tools recommended by the State and the commenter.

Response to Comment 4-2

USEPA completed a Stressor Identification that followed the principals of CADDIS (USEPA 200b) for this TMDL. USEPA conducted a detailed and structured examination of the potential stressors to identify candidate causes of impairment.

Based on recommendations from stakeholder comments, USEPA conducted additional analyses on existing data and new information received during the public comment period. This TMDL must identify the critical water quality related pollutant stressors that are impacting the beneficial uses in Malibu Creek and Lagoon. Based on the results of the Stressor Identification, available data, and weight of evidence, this TMDL identified the pollutants responsible for impacts to the benthic macroinvertebrate community. The Stressor Identification also identified other causes and/or stressors (e.g., invasive species, wildfires, channel alteration, etc.) that may be impacting the benthic macroinvertebrate community. However, our evaluation of the multiple lines of evidence and primary causes of the sources demonstrates that the dominant pollutant stressors are sedimentation and nutrients/algae. Some of the other causes are interlinked and related to the identified dominant stressors (Please see Section 9 of the TMDL for a more detailed discussion).

Our discussion with the SWRCB Science Team and USEPA ORD -- who assisted with the pilot study in southern California – and participation on the State Biological Objectives Regulatory and Stakeholder Committee workshops, illustrated CADDIS as an informative tool for assessing condition and identifying critical causes.

USEPA evaluated sites from source data sets and included the sites that are comparator/reference based on the descriptions provided in the source data reports. We included site MC-12 in our data analyses and used it to compare against MC-15. In contrast to the comment, we observed differences in nutrient concentrations between the two sites.

USEPA evaluated the slope and gradient of all sites in the Watershed and considered this in our evaluation. We did not find consistent results as proposed by the commenter. Comparator/reference sites in an adjacent coastal watershed located at the same slope and gradient as sites in Malibu Creek showed SC-IBI scores of 40 or better. In addition, the CSCI scores showed similar results. Specifically, pMMI bioscores, which accounted for local watershed characteristics, such as geology, precipitation, gradient, etc., were comparable to the observed SC-IBI scores.

USEPA acknowledges that other potential chemical stressors may impact benthic macroinvertebrates. However, the Stressor Identification assessed the available data and did not find evidence of direct impacts from these other potential chemical stressors. We recommend additional monitoring and investigation due to the limited data available during our assessment.

This TMDL computed multiple-year means and medians, in addition, to annual means and medians as recommended by the commenter. We support a causal assessment that is conducted with stakeholders and recommend the inclusion of this effort to the Los Angeles Regional Board during the development of the Implementation Plan.

Response to Comment 4-3

The 2003 Nutrient TMDL for Malibu Creek Watershed addressed nutrient compounds that "exceed the water quality objectives (WQOs) for ***nuisance*** effects such as algae, odors, and scum (RWQCB, 1996)" (USEPA 2003). Specifically, the 2003 Nutrient TMDL addressed depressed dissolved oxygen and excess nutrient loads that resulted in "nuisance" impacts to recreational uses, including the negative visual and odorous presence of scum and algae.

This TMDL is addressing impacts to benthic macroinvertebrates. These listed impairments are linked to different beneficial uses, including aquatic life, WARM, COLD, WILD, and RARE. As such, the TMDL evaluates the stressors, causes and sources impacting the benthic macroinvertebrates. The 2003 Nutrient TMDL did not address the beneficial use impairment linked to benthic macroinvertebrates. For these reasons, and because the 2003 Nutrient TMDL wasteload allocations have been achieved in many instances, lower in-stream loading capacities are established to protect benthic macroinvertebrate and community. See also Response to Comment 6-2 below.

Response to Comment 4-4

In this TMDL, USEPA is including biological threshold action levels to address the impaired biological condition. This TMDL requires pollutant load reductions and ambient monitoring to effectively determine if the impairment conditions are corrected. The biological thresholds include the benthic algal coverage target and the 5-10% probability-based threshold for the CSCI bioscores. Excursions of these threshold actions levels will trigger in-stream monitoring and additional activities to reduce nutrient pollutant loads to the Watershed. These biological threshold action levels are not wasteload allocations, but action levels to inform the monitoring program requirements, assist with the assessment of performance towards meeting the TMDLs and water quality objectives, and ensure protection of beneficial uses.

Response to Comment 4-5

The DraftTMDL established total nitrogen and total phosphorus (TN, TP) in-stream loading capacities. In response to the confusion over the proposed loading capacities in the Draft TMDL (December 12, 2013), USEPA clarified the numeric limits for in-stream loading capacities and discharge-specific wasteload allocations. For discharge-specific wasteload allocations, the concentration-based TN and TP are different and higher based on the relative contribution and assimilative capacity of each source. The TN and TP discharge specific wasteload allocations are consistent with the limits proposed by the commenter.

Sufficient evidence was not provided to demonstrate that the proposed TN and TP cannot be attained. Furthermore, the evidence and other examples show that the TN and TP limits (i.e., 4 mg/L TN and 0.1

mg/L TP), as proposed by the commenter and established in this TMDL, can be achieved at the same treatment plant (USEPA 2008).

Response to Comment 4-6

The State placed Malibu Creek on its Section 303(d) list for "benthic macroinvertebrate bioassessments" because bioassessment data showed there to be a diminished numbers of species or other metrics, compared to reference sites, associated with a pollutant. (Final California 2010 Integrated Report (303(d) List/305(b) Report, Supporting Information, Decision ID 17209). The State's listing referred specifically to data showing exceedances of water quality objectives by total nitrogen and total phosphorus.

The memorandum opinion in Virginia Dept. of Transportation v. EPA, cited by the commenter, invalidated a TMDL for the rate of stormwater flow that USEPA established to address "benthic impairments." USEPA had used stormwater flow for that TMDL because it was an effective "surrogate" measure for regulating the sediment that impaired the benthic organisms. The District Court for Eastern District of Virginia invalidated the TMDL on the ground that stormwater flow is not a "pollutant," as defined by 33 U.S.C. § 1313(d)(1)(C). The Court and the parties agreed that sediment is a pollutant and therefore USEPA had the authority to establish a TMDL for sediment. The Malibu Creek and Lagoon TMDLs do not conflict with this decision because they are established for recognized pollutants. In addition, the present TMDLs are not used as surrogates for other pollutant parameters.

Response to Comments on the Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments

December 12, 2012 Public Notice

July 2, 2013

RESPONSE TO COMMENTS

This document includes USEPA's response to comments submitted in response to the December 12, 2012 Public Notice of the Draft Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments. The comment letter submitted is provided on USEPA Region 9's website with highlighted comment notations added to the original letter at the end of each comment to identify the comment number (e.g., USEPA is responding to the specific comment immediately above the numbered "Comment" in red bold). Any change that is made to the TMDL in response to the comments is indicated in the response. If no change is noted in the response, then no change was deemed necessary in the TMDL. Please see (http://www.epa.gov/region9/water/tmdl/progress.html) for individual comment letters.

5. California Department of Parks and Recreation Angeles District

Response to Comment 5-1

USEPA was informed of the Watershed's plan to remove Rindge Dam (please see Response to Comment 3-2). We strongly support the restoration of habitat and natural sediment processes. USEPA's TMDL provides only the technical assessment, numeric targets and wasteload and load allocations; it does not include an implementation plan because the State has the authority to develop the implementation plan, including specific measures and milestones, for the TMDL. As such, we recommend the commenter provide appropriate implementation recommendations to the Los Angeles Regional Water Quality Control Board during the development of the implementation plan for this TMDL.

Response to Comment 5-2

Comment noted. USEPA recommends the commenter provide the appropriate implementation recommendations to the Los Angeles Regional Water Quality Control Board during the development of the implementation plan for this TMDL.

Response to Comment 5-3

USEPA followed the ranking score as presented in Ode et al. (2005). We determined that a median value of at least a minimum of 40 should be followed. In addition, based on the range of SC-IBI scores observed from our comparator/reference sites, this threshold is appropriate. This sets a minimum threshold and does not preclude higher SC-IBI scores.

Response to Comment 5-4

Comment noted. Based on the multiple comments on the target species richness for Malibu Lagoon, USEPA is setting a target minimum species richness of 40, to be achieved within 15 years. A primary consideration for this adjustment is the large-scale restoration of Malibu Lagoon completed in summer 2012, and the observed multi-fold increase of species richness following large-scale restoration efforts in other coastal lagoon systems in southern California.

Response to Comment 5-5

USEPA agrees with the commenter that the completion of the implementation plan for this TMDL should be a high priority for the State. In this TMDL, we strongly recommendto the State that an implementation plan be completed as soon as possible. We also understand from discussions with the Los Angeles Regional Water Quality Control Board that efforts will be underway to develop the implementation plan soon after the TMDL is established (Personal Communication, Sam Unger).

Response to Comment 5-6

Comment noted. We have included in the TMDL that Malibu Lagoon is critical habitat for the Western Snowy Plover.

Response to Comment 5-7

The Los Angeles Regional Water Quality Control Board's Basin Plan, Chapter 2: "Beneficial Uses", did not identify BIOL as a beneficial use for Malibu Lagoon. Please see web link for the report: http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/Beneficial_Uses/ch2/Revised%20Beneficial%20Use%20Tables.pdf

Response to Comment 5-8

Comment noted.

Response to Comment 5-9

Comment noted.

Response to Comments on the Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments

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RESPONSE TO COMMENTS

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6. County of Ventura and Ventura County Watershed Protection District

Response to Comment 6-1

Based on the updated jurisdiction information submitted, USEPA removed the sediment WLA for Ventura County MS4s. However, we are aware that the lakes and dams in Malibu Creek Watershed maintain spillways where overflows of water may contain sediment that could be transported downstream to Malibu Creek. We strongly recommend monitoring directly downstream of these spillways to ensure that these lakes and dams are not a source of sediment.

Response to Comment 6-2

Based on the updated jurisdiction information submitted, USEPA removed nutrient WLAs for Ventura County MS4s. The 2003 Nutrient TMDL wasteload allocations are still applicable. However, we are aware that the lakes and dams in Malibu Creek Watershed maintain spillways where overflows of water with nutrient loads, which have accumulated in the impoundments, could be transported downstream to Malibu Creek. Based on studies showing accumulated nutrient loads in impoundments as a potential source of nutrients to downstream waterbodies, we are setting a load allocation just downstream of the lakes and dams. For a response to comments on the technical nature of the TMDL, please see the detailed discussion provided in Section 7, 8 and 9 of the TMDL.

Response to Comment 6-3

USEPA disagrees that the targets for the benthic macroinvertebrate impairment are inconsistent with the direction of the State Water Resources Control Board's Biological Objectives for the State of California. As part of the effort to ensure that the most current methodologies are incorporated, USEPA computed the SC-IBI, CSCI, O/E, and pMMI bioscores for Malibu Creek Watershed's benthic macroinvertebrates. This TMDL evaluated available comparator/reference sites located in unimpacted areas with many different watershed characteristics. The evaluation was based on comparing sites that are downstream of

developed or impacted areas with those sites located in unimpacted and upstream of development activities. Multiple indices were computed and evaluated to provide a robust assessment of the benthic macroinvertebrate condition. For discussion on the selection of reference sites, please see Response to Comment 1-D5. For a more detailed discussion of all the different comparator/reference sites evaluated, please see sections 7 and 8 of the TMDL.

See our Response to Comments 7-2 and 8-2 below regarding the Monterey/Modelo Formation.

This TMDL established wasteload and load allocations for nutrients and sediment, which are pollutants causing impacts to the benthic macroinvertebrate community. Wasteload allocations were not established for benthic macroinvertebrates. Biological threshold action levels were set to inform the monitoring requirements and determine if the water quality objectives are achieved (Please see Response to Comment 4-4 for more discussion).

Response to Comment 6-4

Comment noted. USEPA made corrections where appropriate and identified the parks and forest lands and other non MS4 related activities.

Response to Comment 6-5

This TMDL is applicable to the Malibu Creek main stem and the tributaries directly draining into Malibu Creek; these include Stokes Creek, Las Virgenes Creek and Cold Creek. The in-stream loading capacities are applicable to these identified waterbodies.

Response to Comment 6-6

Comment noted. The final TMDL clarifies language for in-stream loading capacities, discharge-specific wasteload allocations and load allocations. Please see Response to Comment 6-4 with regards to the biological targets.

Response to Comment 6-7

Comment noted. Please see Response to Comment 6-1 and 6-2.

Response to Comment 6-8

This TMDL addresses impairments to the benthic macroinvertebrates and related benthic community variables, and identified algae, sediment and nutrients as critical stressors. The 2003 Nutrient TMDL for Malibu Creek Watershed addressed nutrient compounds that "exceed the water quality objectives (WQOs) for ***nuisance*** effects such as algae, odors, and scum (RWQCB, 1996)" (USEPA 2003); these impacted recreational uses, including the negative visual and odorous presence of scum and algae. The beneficial use impacts considered for this current TMDL (i.e., WILD, RARE, SPAWN, etc) are different and more sensitive than the ones addressed by the 2003 Nutrient TMDL (Please see section 3 for a description of the beneficial uses covered by this TMDL).

We noted that the 2003 Nutrient TMDL for Malibu Creek Watershed identified allocations for "TN(NO3/NO2)". This could have resulted in some confusion. However, in our evaluation we considered all the different species of data available. USEPA agrees that different source data sets provided a mix of inorganic and total species nutrient concentrations (i.e., NO3/NO2, TN). In general, we

analyzed and provided the inorganic and total median and average values. These were compared among the different sites in Malibu Creek Watershed.

We disagree that it is inappropriate to assess the relationships between algal cover and total nitrogen, and between algal cover and inorganic nitrogen. Inorganic nitrogen is a component of total nitrogen and a critical part of the nitrogen fixing cycle in the system. Although the ratio between inorganic to total nitrogen may be variable, the assessment of the nutrient data and algal cover in the different forms provide important information about the condition of certain waterbodies in Malibu Creek Watershed. Furthermore, we were able to evaluate the results of Busse et al.'s data that evaluated algal cover and nutrient concentrations. We observed higher nutrient concentrations at impacted main stem sites compared with our comparator/reference sites. Comparably, mean mat algae coverage at the impacted main stem sites range between approximately 65% to approximately 90%, compared to means between 5% and 10% at reference sites. We agree that future monitoring and studies, such as acquiring nutrient and algal cover data from more sites can improve our understanding of the nutrient cycle.

Response to Comment 6-9

Luce (2003) did establish a strong relationship between algal cover and nutrients. Please see our Responses to Comments 1-D94 and 6-12 for more detailed discussion.

USEPA acknowledges that high ionic strength (elevated specific conductivity) water originating from the Monterey/Modelo Formation may be one of many stressors affecting the benthic community in Malibu Creek. However, our multiple bioscores (i.e., CSCI, O/E, pMMI, SC-IBI) demonstrate that high scores associated with good- benthic macroinvertebrate community condition can occur within the unimpacted Monterey/Modelo Formation drainage. USEPA disagrees with the comment that the Monterey/Modelo Formation is the major factor causing impaired benthic macroinvertebrate community. Please see Response to Comments 1-D54 and 1-D65 for a more detailed discussion.

USEPA presents a Stressor Identification that discussed other stressors, including nutrients, that are important variables when evaluating the impacts to the benthic macroinvertebrate and community. The analysis assesses multiple stressors, anthropogenic and natural, that contribute to impaired benthic macroinvertebrate condition in the Malibu Creek watershed. As discussed in Response to Comment 1-D82, the 2003 Nutrient TMDL addressed impairments related to algae and visual indicators of eutrophication. This TMDL addresses impacts to the impaired benthic macroinvertebrates and benthic community, which are linked to different beneficial uses defined by the State.

For comments on the SC-IBI, O/E and CSCI, please see extensive Response to Comments 1-G1, 1-D7, 1-D64, and 4-1. The CSCI bioscores generally show consistent results as those observed with the SC-IBI analysis.

In response to confusion over the Stressor Identification, USEPA provides additional analysis and clarified extensively the individual stressors and causes of impairment in Malibu Creek Watershed that are interconnected to the benthic macroinvertebrate and community condition.

USEPA has been working closely with the State Board's Biological Objectives Science Team in the development of this TMDL. To support the State's effort, the development of this TMDL followed guidance from the Science Team. We note that the Science Team stated "Our evaluation of CADDIS for California was positive, and we recommend its use provided stakeholders recognize its limitations. In our four test cases, we identified a subset of candidate causes, albeit with varying degrees of confidence. Equally as important, we identified several unlikely candidate causes, enabling stakeholders to bypass non-issues and focus follow-up work on candidate causes of greatest importance. However, some candidate causes were left undiagnosed when insufficient, uncertain, or contradicting evidence emerged.

Subsequently, iterative steps in diagnosing and confirming candidate causes will likely result, especially where multiple stressors can result in cumulative impacts. It is clear that communication between regulated and regulatory staff will be a key to the success of any Causal Assessment, for which CADDIS is particularly well-suited."

USEPA agrees that pyrethroid pesticides could play a role in biotic impairment; however, insufficient data and evidence exist to show pyrethroid pesticides as a primary impact on the benthic community at this time. Until more robust and consistent data are available, these are addressed under the general heading of "Urban Runoff."

With regards to comments on the New Zealand Mudsnails, please see Responses to Comments 4-1 and 9-1. In general, there is insufficient evidence identifying the New Zealand Mudsnails as a primary impact. The dominance of the New Zealand mud snail in some parts of the watershed may be in part a result, rather than cause, of the degraded condition of native biota.

The TMDL does *not* state that the source of impairment in Malibu Lagoon is hydromodification. Instead, it states that the Regional Board identified the source of impairment in the lagoon as hydromodification. USEPA agrees that hydromodification is an important factor impacting the Lagoon due to filling and morphological changes historically. However, a major cause of impairment to the Lagoon is excess sediment load from the watershed. This TMDL identifies sediment as a primary pollutant impacting the benthic community in Malibu Creek and Lagoon.

With regards to percent algal cover, please see Response to Comment 1-D84. The following statement is incorrect: "…we understand from conversations with USEPA staff that percent cover data in Busse et al. (2003) was influential in the conclusion that percent cover targets are not being attained in the watershed since the 2003 Nutrient TMDL." Data collected *prior* to the 2003 Nutrient TMDL provides no information on events and observations *since* 2003. Busse et al.'s (2003) data are important because actual measurements of algal biomass as ash-free dry mass and as chlorophyll *a* density are provided; these demonstrated the presence of high concentrations throughout the watershed.

The statement on lack of correlation between algal coverage and contemporaneous measures of inorganic nutrient concentrations does not contradict the linkage between nutrients and algal density. Instead, it demonstrates that (1) measurements of inorganic nutrients by itself are likely insufficient to predict eutrophication responses where algal mats can rapidly cycle inorganic nutrients, and (2) other factors, such as scour or drying, can often limit algal coverage. Furthermore, the relationship between nutrients and algal growth is well established in the literature. Please see Response to Comment 1-D85.

USEPA finds comments regarding the lack of strong correlation between algal cover and contemporaneous nutrient concentrations as misdirected. In general, nutrients will only be limiting on algal growth, and thus show a strong correlation to algal density, when nutrients are limiting on algal growth potential. Under current conditions, Malibu Creek exhibits high nutrient concentrations with nitrogen and phosphorus present at concentrations well in excess of algal growth requirements. Under such conditions a correlation is not expected because nutrient levels are already too high, and other physical factors, such as light availability, drying, and scour, can act on the excessive nutrient load and trigger algal density growth. Furthermore, time step (e.g., hours, days, weeks) is another important variable that is not captured by the instantaneous nutrient and algal coverage measurements. For instance, algal cover may be low (even though the growth rate is high) if algae have been removed by scouring/sloughing or by grazing; meanwhile the instantaneous observations of inorganic nutrient concentrations is not representative of the average exposure concentration over time.

USEPA agrees that ash free dry mass (or ash free dry weight, AFDW) measurements can be useful and a higher chlorophyll *a* to AFDW ratio is expected under shaded conditions. Unfortunately, AFDW measurements are only available for Malibu Creek from Busse et al. (2003).

Response to Comment 6-10

The comment states that the "draft NNE document" was not available for review. USEPA provided the Draft NNE study on Malibu Creek Watershed as an Appendix in the Draft TMDL. The final TMDL includes the Draft NNE study as Appendix F. The commenter appears to misinterpret the uses of the NNE Benthic Biomass Predictor spreadsheet tool. The spreadsheet tool is not intended to be used as a basis for determining whether impairment exists. The determination of impairment is based directly on observed algal density. The spreadsheet tool provides an initial scoping analysis of average nutrient concentrations that may be needed to attain a pre-specified algal density target, such as 150 mg/m^2 maximum chlorophyll *a*. The results from the Draft NNE study on Malibu Creek Watershed is cited as supporting information during the development of the TMDL.

Response to Comment 6-11

USEPA disagrees with the comment. The quote referenced in this comment is incomplete and taken out of context. The TMDL identified a central tendency of total nitrogen for the summer period of between 0.52 to 0.67 mg/L for reference sites ***outside the Modelo Formation.*** The lower end of the range is the average of Busse's data for Cold Creek and Palo Comado Creek and the upper end is the result observed at Cold Creek. The TMDL identified a total nitrogen reference concentration of 1.30 mg/L within the Modelo Formation. The source of these values is more explicitly presented in the TMDL. Inorganic nutrients from the following comparator/reference sites are included: CC3, CC11, PC8, LCH18, SC14, AS19 (outside the Modelo Formation), CH6 and LV9 (draining the Modelo Formation).

The results for phosphorus concentrations are revised after it was determined that Heal the Bay was reporting mass as HPO_4, not mass as P (see comment 1-D44). The following reference concentrations are recalculated: PO_4-P is <0.05 mg/L outside the Modelo Formation and <0.18 mg/L within the Modelo Formation. USEPA set the instream loading capacity at 0.2 mg/L; we rounded up the PO_4-P concentration based on the assumption that most phosphorus would be present in inorganic forms in areas of significant phosphorus surplus.

Response to Comment 6-12

USEPA evaluated the critical conditions observed in Malibu Creek main stem and the tributaries. We determined that there was a seasonal difference with regards to benthic macroinvertebrate community conditions, flow, nutrient concentrations, algal growth and sedimentation. In addition, pollutant loading behavior and sources vary with seasons. This seasonality is comparable to the findings in the 2003 Nutrient TMDL for Malibu Creek Watershed and in adjacent coastal watersheds (e.g., Calleguas Creek Watershed). Luce (2003) showed a difference in algal coverage between spring and fall; correlation analysis indicated a consistent relationship between inorganic nitrogen and algal cover in the fall. Furthermore, this TMDL is addressing the impacts to the benthic macroinvertebrate community, which requires the support of a more sensitive beneficial use.

For a detailed discussion of the impacts to the benthic macroinvertebrates from impaired water quality, physical habitat modification, and other stressors, please see Section 9.

Overall, USEPA is addressing the impacts to the benthic macroinvertebrates in the Malibu Creek main stem and Malibu Lagoon. In evaluating the impaired conditions and the various stressors and causes of impacts to the biological community, the TMDL must assess the geographical extent of the impact. Due to the direct hydrological connection between Malibu Creek and Malibu Lagoon, upstream flow and pollutants have a direct impact on the receiving waterbody, Malibu Lagoon. USEPA disagrees with the comment that expected natural conditions for the Malibu Creek should not necessarily be extended to Malibu Lagoon, due to the presence of breaching. Due to the two waterbodies' direct hydrological

connection, it is critical to ensure that the beneficial uses of both the Creek and Lagoon are protected. In order for Malibu Lagoon to maintain its ability to support aquatic life and rare and endangered species, upstream Creek conditions must be maintained for all seasons.

USEPA considered the nature of sediment transport, urban flow, and nutrient loading upstream of a dam or lake and the link to the Malibu Creek main stem and Malibu Lagoon. Evaluation of additional data and evidence indicate a difference between the upstream and downstream hydrology of an impoundment when it comes to pollutant loading and its impact to the benthic macroinvertebrate. As such, USEPA made adjustments to account for this difference. Please see Section 10 for a detailed discussion.

In this TMDL, USEPA provided support for the in-stream loading capacity levels by using the standard and nationally recognized Reference Waterbody Approach (USEPA 2000a; 2000b; 2003). This is an accepted approach to determining appropriate reference conditions that are representative of the local watershed.

USEPA disagrees with the comment that the NNE Tool was used as the basis for setting wet weather allocations. As part of USEPA's comprehensive evaluation of all available data, and stakeholder requests to consider the NNE Tool development efforts, this TMDL included the NNE case study for Malibu Creek Watershed. The study was conducted as part of the State's assessment of the total nitrogen and total phosphorus levels needed to support a healthy benthic community.

USEPA conducted further analysis and clarified the in-stream loading capacities and the discharge specific wasteload allocations for the various identified point sources. (Please see Section 10 for a detailed discussion).

Response to Comment 6-13

USEPA clarified the difference between in-stream loading capacity and the discharge specific wasteload allocations. Based on the operational details we obtained from the LVMWD, and performance of other wastewater treatment plants (USEPA 2008), the Tapia WRF will be capable of achieving its assigned WLAs without the need for significant new capital investments.

Response to Comment 6-14

Please see Response to Comment 4-6.

Response to Comment 6-15

USEPA has been in continuous discussion with SWRCB State Bio-Objectives Science Team to support the state's effort and to include the CSCI calculations, when the model became available. This TMDL includes the CSCI and SC-IBI bioscores; the Malibu Creek Watershed CSCI bioscores factored in the local watershed characteristics including gradient, geology, precipitation, etc. USEPA views these as multiple lines of evidence. We understood from the Science Team that they did not state that the "SC-IBI is not appropriate for setting biologically based objectives" (Personal Communication, Ken Schiff). The Science Team's objective was to develop a consistent statewide biological index that can be comparable across regions; prior to the development of the CSCI, there were multiple regionally specific IBI's developed for California including North Coast IBI, Eastern Sierra IBI, Central Valley IBI, and SC-IBI. Developing a statewide CSCI does not necessarily negate the SC-IBI as a tool or another line of evidence. Each of these biological indices provides different types of information about the benthic community (e.g., species loss, community function).

The California Surface Water Monitoring Ambient Program Wadeable Stream Method for Bioassessment (SWRCB 2007) was used to collect all the benthic macroinvertebrate data in Malibu Creek Watershed. This is the same wadeable stream method used during the monitoring of the Californian reference sites for the development of the CSCI; these methods are applicable in wadeable streams and did not differentiate between non-perennial or perennial streams.

With regards to the biological objectives thresholds, our discussion with the Science Team provided updated information. This TMDL is setting a biological threshold action level between 5-10% that is consistent with current discussion with the regulators and the stakeholders. The recommendations section of this TMDL also includes a paragraph that describes the current development status of the Statewide Bio-Objectives. When the state adopts final biological thresholds, these will supersede the numeric biological threshold established in this TMDL.

Response to Comment 6-16

USEPA disagrees with the commenter that the comparator/reference sites are inappropriate for Malibu Creek Watershed. These comparator/reference sites are in Malibu Creek Watershed and cover the range of local characteristics sites, such as coastal zones, gradient, Monterey/Modelo Formation, slope, etc. These sites are appropriate for the purposes of this TMDL because they demonstrate the range of natural conditions observed in Malibu Creek Watershed; these comparator/reference sites are located in undeveloped areas, unimpacted areas, upstream of developed areas and/or non-adjacent to anthropogenic activities. We should note that the sites in the adjacent subwatersheds, Lachusa and Solstice, are located in Malibu Creek Watershed and are of comparable gradients. In addition, the Solstice station drains pockets of the Monterey/Modelo Formation. The advantage of these sites is the lack of urban activities nearby, and they can serve as one of the many representative ranges of natural conditions observed in Malibu Creek Watershed. The comparator/reference sites evaluated are representative of water quality from non-urban, urban development, and Monterey/Modelo Formation with/without urban development areas.

Following additional analyses and evaluation of the CSCI results, the Draft TMDL's statement, "SC-IBI category rankings are not necessarily representative of the unique physical and geological situation of Malibu Creek", may not be appropriate. The multiple lines of evidence demonstrate that scores above 40 are achievable and generally correlate with our comparator/reference sites located in unimpacted areas of the watershed. As discussed above, additional evidence showed that the Monterey/Modelo Formation is located in pockets throughout the Watershed; many sites are located in or drain the marine geological formations.

USEPA disagrees with the commenter that the predictors used in the CSCI model were not representative of the ranges observed in Malibu Creek Watershed. Further examination showed that the ranges observed for the multiple predictors of local watershed characteristics approximate those observed in the Malibu Creek Watershed. Furthermore, the Monterey/Modelo Formation is not unique to Malibu Creek Watershed, but found in many regions of California, including the Monterey County, Kern County, Santa Barbara County, Ventura County and Orange County. Thus, the population of reference sites (>1600 evaluated for the CSCI) are appropriate for use in Malibu Creek Watershed. The O/E model presented in the Draft TMDL was updated and corrected. The current CSCI models used were not available at the time USEPA public noticed the Draft TMDL in December 2012; however, we presented the O/E model in the Draft TMDL to show USEPA's intent to match the Statewide Bio-Objectives development efforts. The California CSCI model computed in the TMDL considered the factors that are influential on BMI community structure and metrics, including elevation range, stream gradient, temperature, soil permeability, hydraulic conductivity, and watershed area.

Response to Comment 6-17

Comment noted. USEPA made corrections to the jurisdictions and boundaries covered by the cities.

Response to Comment 6-18

USEPA clarified the waterbodies addressed in the TMDL. This TMDL covers the Malibu Creek main stem and the tributaries downstream of Malibou Lake that drains directly into Malibu Creek; these include Las Virgenes Creek, Cold Creek, and Stokes Creek. USEPA considered the sources of impairments causing impacts to the benthic macroinvertebrate community and found clear hydrological connection between the tributaries and Malibu Creek, and observed the potential for sources upstream of the Creek to be transported. In addition, USEPA conducted presentations and attended numerous Malibu Creek Watershed Management Council Stakeholder meetings in Malibu Creek Watershed (between March 2011 and October 2012). At these meetings, many stakeholders requested USEPA to evaluate all possible sources, including those tributaries upstream of Malibu Creek. In response to stakeholder concern and submitted information from upstream sources, USEPA conducted a comprehensive assessment and found that sources upstream of Malibu Creek are of critical concern. This final TMDL also identified the responsible parties for the sources.

Response to Comment 6-19

Please see Response to Comment 4-4.

Response to Comment 6-20

This TMDL sets in-stream loading capacities, discharge specific waste load allocations and load allocations for nitrogen and phosphorus. The in-stream loading capacities are receiving water limits and represent the capacity of the stream beyond which impairments to the benthic macroinvertebrate community is expected. Due to the various characteristics of the point sources and the seasonality of Malibu Creek, USEPA defined the discharge-specific wasteload allocations to clarify regulatory requirements and the associated responsible entities.

Response to Comment 6-21

USEPA have observed that the cumulative construction activities, as those experienced in Malibu Creek Watershed, along with other developmental activities, have likely led to the loss of native species, increasing urban runoff, and excessive nutrients. We have observed all of these occurrences in Malibu Creek Watershed. To provide more clarify, we included additional references.

Response to Comment 6-22

Comment noted and correction is included in the TMDL.

Response to Comment 6-23

Comment noted and correction is included in the TMDL. . The correct version cited is the 2008-2010 CWA 303(d) list. Please see the weblink:
http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/303d_list.shtml

Response to Comment 6-24

USEPA based the species diversity benthic community threshold on reference and baseline information from comparable coastal estuaries in Southern California. In the absence of baseline data for Malibu Lagoon, but evidence of long-term impact in the Lagoon, it is scientifically and technically appropriate to determine the minimum expected Lagoon conditions that would protect the designated beneficial uses. Furthermore, the analysis of the southern California coastal estuaries are comparable in Mediterranean climate, precipitation, coastal locations, and vegetation and habitat type; for two of the coastal estuaries, additional studies evaluated the effect of restoration actions and the expected species diversity recovery. For these reasons, USEPA set a minimum benthic community species diversity threshold at 40. This is set as a biological threshold action level. Please see section 10 for more discussion.

Response to Comment 6-25

Please see Response to Comment 6-24.

Response to Comment 6-26

The statement was removed from page 3-2 and 10-2.

Response to Comment 6-27

Please see Response to Comments 6-12 and 6-16.

Response to Comment 6-28

Considerable evidence and studies on coastal estuaries have demonstrated that a healthy and ecologically vibrant benthic community typically maintains large taxa diversity, upwards of 100-200 species in some cases. In addition, monitoring of the benthic community in Malibu Lagoon by other investigators has shown that Malibu Lagoon's benthic species diversity is scarce compared to what would be expected in a healthy benthic community (Ambrose et al. 1995; Ambrose and Orme 2000). Please also see Response to Comment 6-24.

Response to Comment 6-29

Comment noted. USEPA received additional GIS coverage for the Ventura County stormwater system.

Response to Comment 6-30

The analysis shown in Table 6-4 is for the LACDPW F-130 gage, where continuous flow is observed during the post-impact period. Months with average flow of zero shown in Table 6-2 are for the short period of record at the USGS 11105510 gage; Table 6-2 does not show any zero flow months at the F-130 gage. IHA change analysis could only be conducted at the F-130 gage due to its long period of record. The title of Table 6-4 is modified to clarify the reference to the F-130 gage.

Response to Comment 6-31

USEPA agrees with this suggestion. The column header "Applicable Criteria" has been changed to "Target."

Response to Comment 6-32

Table 7-4 and the accompanying text in the TMDL present the available data on turbidity. Conclusions are not made regarding impairment. We note this data set from Heal the Bay Stream Team includes samples from storm events when elevated turbidity would be expected. Observations of high turbidity levels were reported during storm events monitored by USEPA TSS-Turbidity sampling effort.

Response to Comment 6-33

A more complete summary of nutrient concentrations including LVMWD data, among others, are presented in the TMDL.

Response to Comment 6-34

USEPA disagrees with this comment. The TMDL must comprehensively evaluate all available data. It would be inappropriate for USEPA to exclude data and not consider valuable information from evaluating inorganic and total nutrient concentrations. Both of these forms of nutrient data are relevant and provide important information regarding the nutrient conditions in Malibu Creek Watershed.

Response to Comment 6-35

USEPA evaluated all the available and relevant data for this TMDL. These included the total nitrogen and the inorganic species. Please see Response to Comment 6-8.

Response to Comment 6-36

USEPA disagrees with this comment. However, we note that there was some confusion in the presentation of the data in the Draft TMDL. For the final TMDL, we clarified the data and provided additional analyses previously completed to demonstrate our finding.

Response to Comment 6-37

Comment noted. We included the comment in Section 11 detailing USEPA's recommendations for this TMDL.

Response to Comment 6-38

This comment references a memorandum prepared by Geosyntec Consultants for the County of Ventura. The memorandum provides information on BMP performance and concludes that "there is no apparent single solution available to consistently meet the numeric targets established within the TMDL for both TP and TN", such that "consistent MS4 compliance with the low TMDL numeric targets at all outfalls during both dry and wet weather is considered technically infeasible."

Please see Response to Comment 4-5.

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December 12, 2012 Public Notice

July 2, 2013

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7. City of Agoura Hills

Response to Comment 7-1

USEPA determined the appropriate minimum biological thresholds required to protect beneficial uses based on our evaluation of the impaired and unimpacted conditions in Malibu Creek Watershed. From this comprehensive assessment and scientific knowledge of similar coastal watersheds in Southern California, USEPA determined that long-term, excessive algae presence or coverage negatively impact the benthic macroinvertebrate and its community. USEPA is meeting the regulatory requirements of Clean Water Act 303(d) by establishing levels that will lead to protection of beneficial uses for waterbodies identified as impaired by the State. Please see Response to Comment 14-1.

Response to Comment 7-2

USEPA agrees with the commenter. As a result, this TMDL evaluated all available data collected in Malibu Creek Watershed. Our analysis included an evaluation of the Monterey Modelo/Formation (i.e., brackish nature of the Watershed) and its effects on water quality and the benthic macroinvertebrate community. We isolated the predictor variables specific to Malibu Creek Watershed, including multiple parameters related to the geology, and computed specific California Stream Condition Index (CSCI) bioscores for Malibu Creek Watershed. The analysis considered the most recent scientific methods and near 20 years of available water quality, physical habitat, and benthic community data specific to Malibu Creek Watershed. This resulted in review and analysis of over 120 separate data sets and studies completed for Malibu Creek Watershed to date. See also Response to Comment 19-2.

Response to Comment 7-3

The timing of the public notice and comment period was a result of the schedule for establishment of TMDLs in the Los Angeles region required by an amended consent decree between USEPA and environmental plaintiffs. The amended consent decree required USEPA to approve or issue the final

TMDLs on the schedule by May 24, 2013, and the Malibu Creek and Lagoon TMDLs are the last of these TMDLs to be completed. After the close of the comment period, the environmental plaintiffs agreed to extend the deadline to July 2, 2013, in part because of the large number of comments received on the draft TMDLs. Based on the many detailed comments received, it appears that most commenters were able to review and comment on the draft TMDL within the timeframe.

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8. Heal the Bay

Response to Comment 8-1

Comment noted. USEPA considered all available data and completed a comprehensive analysis of the appropriate nitrogen and phosphorus concentrations representative of the unimpaired conditions in the Malibu Creek Watershed. The comment also included discussion of some data analyses; our findings (presented in Section 8.3) are in general agreement with these analyses.

Response to Comment 8-2

USEPA agrees the mix of anthropogenic related sources of nutrients should be compared with nutrient sources from Monterey/Modelo Formation, and the associated benthic macroinvertebrate condition should be evaluated. In our assessment, USEPA completed these comparisons and observed that the portions of the streams within the Monterey/Modelo Formation, in the absence of direct or adjacent development related activities, showed elevated phosphorus levels. These marine geologic sources of elevated phosphorus levels occur under natural conditions. The benthic macroinvertebrate community inhabiting the Creek and tributaries experience these geologic conditions in absence of non-natural activities and modifications to the watershed. This difference was also a consideration during our assessment.

USEPA conducted a scientific assessment of the available data and established appropriate in-stream loading capacities and discharge specific wasteload allocations that support the designated beneficial uses. For the specific actions and measures, the State has the authority to develop an implementation plan for the TMDL.

Response to Comment 8-3

Comment noted. USEPA did not set a numeric target for invasive species because of limited data, spatially and temporally, and some initial identified uncertainties in the available data.

In response to the request for setting a higher SC-IBI score, please our Response to Comment 5-3. In addition, the State is currently developing the California Stream Condition Index which will provide numeric bioscores based on two indices and a robust population of reference sites collected for the California.

In response to the request for higher species diversity target for Malibu Lagoon, please see Response to Comment 5-4. This final TMDL set a species diversity target of 40 for Malibu Lagoon.

Response to Comment 8-4

Comment noted.

Response to Comment 8-5

USEPA's assessment showed that the high natural uplift rates of the Santa Monica Mountains (see Section 4.4) can lead to an excess supply of sediment to the tributaries of Malibu Creek. We examined the ability of flows to move sediment mass between the current period and the period prior to extensive development to assess the impact of anthropogenic related sediment loading. Our analysis showed that a reduction of 38 percent in channel sediment transport would be sufficient to supporting pre-development conditions, as defined by the model analysis.

USEPA agrees that construction projects are potential contributors of sediment. As such, future general and construction stormwater permits should include the relevant monitoring and limits presented in the TMDL.

Response to Comment 8-6

Comment noted. In the Recommendation section of the TMDL, we provided additional recommendations regarding the OWTS.

Response to Comment 8-7

Comment noted. The Los Angeles Regional Board, in its capacity as the State implementation authority, will determine the appropriate timeframe for meeting the wasteload allocations when it develops the final implementation plan and during the re-issuance of each permit.

Response to Comment 8-8

See Response to Comment 8-3.

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9. County of Los Angeles and Los Angeles County Flood Control District

Response to Comment 9-1

USEPA agrees that wildfires are important in the Malibu Creek Watershed. We did not assert "that wildfires are not a significant contributing factor to benthic community impairments in Malibu Creek and Lagoon." Wildfires are a natural part of this landscape and an integral part of the long-term life history of all aquatic organisms. This TMDL focuses on human related activities and their impacts on the waterbodies, such as when human modifications increase total runoff and reduce channel stability that enhances adverse effects of fire. The goal of this TMDL is to address biological impairment, as identified on the CWA 303(d) Impaired Waters List, and restore the benthic community.

The TMDL states that "Fire is a recurrent and important factor of the landscape in southern California that can cause important temporary changes in runoff and sediment loading;" and that fire impacts "can affect benthic macroinvertebrates and physical habitat." Literature is referenced in the TMDL describing the potential severe impacts of fire on benthic communities. The evidence, however, is insufficient to establish a strong temporal relationship between the anthropogenic influenced fire events and impaired bioscores. For example, the major wildfire of 2007 did not result in lower SC-IBI bioscores at stations impacted by the fire compared to those not impacted. In fact, some stations impacted by fire (such as reference station SC-14) continued to exhibit fair or better SC-IBI scores.

For these reasons, fire was eliminated as a *primary* cause of impairment. Although USEPA agrees that the New Zealand mudsnail is also likely "a potential contributor to impairment", we did not find the New Zealand mudsnail to be a *primary* cause of observed impairment. The evidence to data is insufficient and the mudsnail is not a primary stressor because Malibu Creek was listed for biological impairment prior to appearance of the invasive mudsnails in 2006. USEPA encourages continued efforts to control the New Zealand mudsnail in the Watershed.

Response to Comment 9-2

The in-stream nutrient loading capacity is based on average total nitrogen and phosphorus concentrations observed for multiple comparator/reference sites in Malibu Creek Watershed. In addition, these sites are upstream of anthropogenic activities and considered the most representative natural conditions in the Watershed. Since the in-stream capacity is based on existing and average of data points, USEPA finds the in-stream capacity to be appropriate for Malibu Creek Watershed.

The NNE framework, applied in the Malibu Creek Watershed, resulted in low total nitrogen and phosphorus concentrations. The in-stream loading capacities established are higher than the calculated NNE targets, which some may consider the natural background concentrations. USEPA is basing its determination of the in-stream loading capacity on the expected experience or observations of the unimpacted conditions in the Watershed (i.e., Reference Approach Method). Thus, the established in-stream concentrations are not less than the background concentrations.

The TMDL sets discharge specific concentration-based wasteload allocations. During the implementation of the wasteload allocations, the State may consider mass-based discharge specific wasteload allocations. This TMDL provides the estimates for mass-based wasteload allocations as an example.

It is critical that the benthic algal coverage targets are included along with the wasteload and load allocations. The nutrient allocations, by themselves, are not sufficient to provide a complete assessment of the benthic community condition. As the commenter stated, the concentration and mass-based allocations are snapshots in time of the condition in the water column. It is equally important to evaluate a second line of evidence to determine the effectiveness of the implementation measures, which are set to achieve the water quality goals and the protection of the beneficial uses for this TMDL. The benthic algal coverage targets are maintained as biological threshold action levels in this TMDL.

Response to Comment 9-3

USEPA disagrees with the comment. The CWA 303(d) Impaired Waters List for California identified Malibu Creek as impaired due to sedimentation and impacted benthic macroinvertebrate community. Our evaluation identified Malibu Creek and several tributaries directly upstream of Malibu Creek with less optimal physical habitat scores. The State of the Malibu Watershed Report (Sikich et al. 2013) provided evidence of serious sedimentation and erosive conditions in many sections of the Creek and tributaries (e.g., 21.29 miles of 68 surveyed stream miles were impaired by excess fine sediments). USEPA modeled the sediment transport capacity in the Malibu Creek Watershed to determine how sediment would be transported under certain flow conditions. These results provide evidence that sedimentation is a critical impairment in many parts of the watershed's stream system. Furthermore, eroded sections of the stream would directly modify the benthic macroinvertebrate community. Please see Section 9 of the TMDL for detailed discussion. The Stressor Identification demonstrates that channel alteration and modified flow causes greater transport of sediment, resulting in excess sedimentation to Malibu Creek and Malibu Lagoon, which supports habitat for many rare and endangered species.

The evidence of sedimentation and its impairment on the benthic community is supported by our assessment of the data to date. Many locations have been identified with excess deposition of fines and/or stream bank instability. These indicators of sedimentation demonstrate that impacts are due to both accumulation of bedded sediment in the creek and high-concentration pulses of sediment moving through the stream network during high flow events. These sediment loadings are associated with substrate instability, as evidenced by the large variations observed in physical habitat data across years. The TMDL also states that physical habitat measures of sedimentation are not solely impacting the benthic community. USEPA's assessment found that anthropogenic changes in sediment transport capacity lead to large sediment loads transported and contribute to the impairment of natural biology.

USEPA does not assert that more sediment loading comes from urban discharges than from undeveloped areas. Although USEPA acknowledges that urban impervious surfaces may contribute stormwater with low concentrations of solids, these impervious surfaces result in unnaturally high flows that transport sediment loads flowing off of urban lands or creating high flow energy that erodes in-stream channel areas, which then result in habitat instability and excess sediment accumulation in the lagoon.

USEPA disagrees with the comment that "the TMDL may inadvertently exacerbate hydromodification by further decreasing the amount of sediment in MS4 discharges, which makes the water more "sediment-hungry" and more erosive." The TMDL should not exacerbate hydromodification because the sediment load allocation is set to address the excess sediment and transport of eroded sediment from natural habitat due to MS4 discharges. The sediment model accounted for impervious flow and not flow from natural conditions. USEPA does not believe that these sediment load allocations will result in decreasing the natural sediment amount.

Response to Comment 9-4

Comment noted. The parks and forested lands were included as part of the load allocations (see revised Figure 4-1).

Response to Comment 9-5

The comment misstates the selection of comparator/reference sites in this study. The coastal sites on Lachusa and Solstice Creek are comparable to lower Malibu Creek main stem sites in terms of elevation and climate. Sites CH-6 on Cheseboro Creek in the upper watershed and LV-9 on Las Virgenes Creek are included as a comparator/reference site because they appropriately represent conditions experienced in the drainage of the Monterey/Modelo Formation. These sites appropriately represent the mix of marine and non-marine sediments in Malibu Creek Watershed. Please see Response to Comment 6-16.

Response to Comment 9-6

USEPA agrees that brackish water originating in the marine-derived Monterey/Modelo Formation also influences downstream sites. Since the main stem of Malibu Creek receives flow from both marine and non-marine geology, and exhibits specific conductivity values in the range between those observed in marine and non-marine sites, it is appropriate and scientifically sound to compare across all the sites in the Watershed.

USEPA disagrees with the suggestion that "the shaded area for the Modelo Formation in Figures 8-9 and 8-10 should be revised to include MC-1, MC-12, MC-15, and TR-17." The shaded area shows only sites that mostly or wholly drain the Modelo Formation and tend to have specific conductivity values greater than 3,000 µS/cm. The three main stem "MC" sites fall in the mid-range for conductivity and are thus not representative of the Modelo Formation alone. Station TR-17 does not drain the Modelo Formation at all and has specific conductivity that is similar to the reference sites that lie outside of the watershed. The cited figures are modified for clarity to show that the shaded area for "reference sites" is highlighting the non-marine reference sites only.

Response to Comment 9-7

The waterbodies addressed by this TMDL include Malibu Creek main stem and the main tributaries draining into the main stem: Las Virgenes Creek, Cold Creek, and Stokes Creek. The main tributaries are

included because of their direct hydrological connection and source of impairment to the Malibu Creek main stem.

Response to Comment 9-8

Comment noted. Based on the current efforts to date on the development of the Statewide Biological Objectives, this TMDL presented the 5% and 10% thresholds as the basis for evaluation of the existing data. USEPA included a CSCI 5-10% biological threshold action level to provide necessary monitoring guidance and assurance that the benthic community is protected. USEPA provides recommendations stating that the adopted Statewide Biological Objectives final numeric threshold should supersede those in this TMDL when the Statewide guidance goes final. Please also see Response to Comment 4-4.

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10. City of Hidden Hills

Response to Comment 10-1

USEPA believes that implementation of the TMDL will reduce (but not eliminate) algae to levels that are protective of beneficial uses of Malibu Creek. See Response to Comments 4-3, 6-12, 7-1, and 14-1.

Response to Comment 10-2

See Response to Comment 7-2.

Response to Comment 10-3

See Response to Comment 7-3.

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11. City of Malibu

Response to Comment 11-1

USEPA appreciates the comment. We recognize the City's efforts to date and the extensive restoration actions completed in summer 2012. At this point, USEPA does not believe it is appropriate to remove Malibu Lagoon from this TMDL because actions taken to date are not completed (e.g., centralized wastewater treatment plant, etc.) and final restored conditions have not been demonstrated. However, this TMDL only sets loading capacities, wasteload and load allocations for Malibu Creek and the tributaries downstream of Malibou Lake. To ascertain and quantitatively demonstrate progress, this TMDL sets a biological threshold action level for Malibu Lagoon to ensure planning and monitoring programs protect the beneficial uses in Malibu Lagoon.

Response to Comment 11-2

USEPA disagrees with the comment. Please see Response to Comment 9-3.

Response to Comment 11-3

USEPA selected the Solstice Creek site, SC-14, as a comparator/reference site based on its location in an unimpacted (i.e., no development or other anthropogenic activities upstream of adjacent) area of the watershed. Subsequent evaluation of the bioscores for this site reveals it to be among the highest quality benthic macroinvertebrate communities analyzed in the TMDL. Additionally, USEPA selected an upstream site on Las Virgenes Creek, LV-9, as another comparator/reference site within the Monterey/Modelo Formation because it is located in an unimpacted region without upstream or adjacent development or other anthropogenic activities. LV-9's bioscores reflect good conditions compared with other sites in the Monterey/Modelo Formation with development in their catchments.

USEPA disagrees with the comment that data after 2003 were not included or assessed. USEPA collected all available nutrient data for the Malibu Creek Watershed. USEPA, on numerous occasions, requested submittal of supporting data and information regarding the impairments identified in this TMDL. Many different nutrient data sets after 2003 were analyzed and included in our determination for this TMDL. See Response to Comment 1-1.

USEPA disagrees that the "draft TMDL also reached conclusions without considering which stressors are the predominate factors that cause low IBI scores or lower than expected numbers on inventories." In fact, USEPA considered a multitude of proximate stressors, analyzed their relationships with bioscores, and compared stressor data between reference and impaired sites. The detailed evaluation appears in Chapter 9, "Linkage Analyses."

Response to Comment 11-4

Comment noted.

Response to Comment 11-5

USEPA included the technical conclusions and limits that are found in the Regional Board's technical support document, "Nitrogen Mass Loading for Malibu Lagoon and Review Summary of Previous Studies on Mass Loadings from OWDS to the Lagoon" (Lai, 2009). USEPA consulted with the Los Angeles Regional Board and provided the requirements outlined in the Basin Plan Amendment for Malibu OWDS Prohibition at Civic Center Area: (http://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/Malibu/MalibuOWDS/Notification%20of%20Effective%20Date%2001-28-2011.pdf)

Consequently, the load allocations are expressed as a concentration-based limit.

Response to Comment 11-6

Comment noted.

Response to Comment 11-7

USEPA must include an allocation in the TMDL for all significant identified sources. USEPA re-evaluated all data, including data submitted after the public comment period following the Draft TMDL, and appropriately clarified the OWDS source in our Stressor Identification.

Response to Comment 11-8

USEPA disagrees with the comment that the OWDS allocation should be removed from the TMDL. The TMDL is a technical assessment of background information, all available data, sources and appropriate limits and wasteload and load allocations that are necessary to ensure protection of the confirmed impairment and the designated beneficial uses.

Response to Comment 11-9

USEPA provided additional clarification of the recent restoration efforts in Malibu Lagoon.

USEPA disagrees with the comment that looking to other comparable coastal estuaries in southern California is inappropriate. In particular, the referenced coastal estuaries have also undergone similar anthropogenic impacts, and restoration efforts have demonstrated significant improvement. USEPA expects similar results for Malibu Lagoon following the extensive restoration effort in summer 2012. Please also see Response to Comment 11-1 above.

Response to Comment 11-10

Please see Response to Comments 6-16 and 9-5.

Response to Comment 11-11

Comment noted. The TMDL includes appropriate reference and load allocations for park and forest lands.

Response to Comment 11-12

USEPA did not use the Index of Biological Integrity (IBI) scores to document the current biological integrity of Malibu Lagoon. The SC-IBI is not appropriate for application to lagoons, and is not used to assess biological integrity within the lagoon in the TMDL. Since an estuarine biotic index has yet to be developed for Malibu Lagoon, only taxa counts and taxa richness scores are evaluated.

We thank the commenter for pointing out the 2012 study "Sources of Fecal Indicator Bacteria and Nutrients to Malibu Lagoon and Near Shore Ocean Water, Malibu, California." Findings from this effort are now discussed in Sections 5.2.2 and 8.2 of the TMDL report.

Response to Comment 11-13

USEPA disagrees that a UAA should be completed prior to implementation of the TMDL. Clean Water Act 303(d) states that TMDLs should be completed as soon as reasonable. USEPA is required by the Heal the Bay Consent Decree to complete the Malibu Creek and Lagoon TMDLS by the extended deadline of July 2, 2013.

For the comment on State Biological Objectives, please see Response to Comment 6-15.

For the comment on feasible treatment technology, please see Response to Comment 4-5.

Response to Comment 11-14

Please see Response to Comments 11-1 and 9-3.

USEPA reviewed the CSCI models and applied each bioscoring method to the benthic macroinvertebrate data in Malibu Creek Watershed. USEPA has conducted detailed analysis of the CSCI models (i.e., O/E; pMMI) and has consulted with the State Board's Biological Objectives Science Team to evaluate the results. USEPA believes that sufficient data and analyses, including application of multiple lines of evidence, have been completed, and thus, should not delay the establishmenmt of this TMDL. Please see our Response to Comment 27-1.

With regards to ongoing efforts by USGS to develop SPARROW models for California, peer-reviewed and published results from this effort have not been provided to date. We also note that SPARROW is not a mechanistic model, but, as stated in the full version of its acronym, "Spatially Referenced

Regressions On Watershed Attributes." The method provides estimates of annual average nutrient loads based on readily available watershed characteristics, such as percent urban development, fertilizer use rates, precipitation, etc. These results are applicable to the entire state of California as a whole, and do not provide the site and region specific information for Malibu Creek Watershed. In fact, the average prediction errors on annual mean loads tend to be large, with one standard deviation ranges of ± 21 to 69 percent for TN and ±46 to 96 percent for TP models developed for other parts of the country.[4] While SPARROW is useful for broad-scale estimates of nutrient loading, calibrated site-specific models typically provide greater accuracy.

Consequently, USEPA finds it inappropriate to wait for completion of SPARROW models to evaluate nutrient loading to Malibu Creek. Current data records and analytical tools provide strong empirical evidence of elevated nutrient concentrations within the Creek and Lagoon.

[4] Preston, S.D., R.B. Alexander, G.E. Schwarz, and C.G. Crawford. 2011. Factors affecting stream nutrient loads: A synthesis of regional SPARROW model results from the continental United States. *Journal of the American Water Resources Association,* 47(5): 891-915.

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12. City of Thousand Oaks

Response to Comment 12-1

See Response to Comment 6-1.

Response to Comment 12-2

See Response to Comments 6-2, 6-3, 6-8, and 6-12.

Response to Comment 12-3

See Response to Comments 4-4, 6-3, 6-15, and 6-16.

Response to Comment 12-4

Comment noted. USEPA made corrections where appropriate and identified the parks and forest lands and other non MS4 related activities (see Section 5.2.4 and Section 10.2.3). See also Response to Comment 6-4.

Response to Comment 12-5

See Response to Comment 6-5.

Response to Comment 12-6

See Response to Comment 6-6.

Response to Comment 12-7

See Response to Comment 6-7.

Response to Comment 12-8

See Response to Comment 6-8.

Response to Comment 12-9

See Response to Comment 6-9.

Response to Comment 12-10

See Response to Comment 6-10.

Response to Comment 12-11

See Response to Comment 6-11.

Response to Comment 12-12

See Response to Comment 6-12.

Response to Comment 12-13

See Response to Comment 6-13.

Response to Comment 12-14

See Response to Comment 6-14.

Response to Comment 12-15

See Response to Comment 6-15.

Response to Comment 12-16

See Response to Comment 6-16.

Response to Comment 12-17

See Response to Comment 6-17.

Response to Comment 12-18

See Response to Comment 6-18.

Response to Comment 12-19

See Response to Comment 6-19.

Response to Comment 12-20

See Response to Comment 6-20.

Response to Comment 12-21

See Response to Comment 6-21.

Response to Comment 12-22

See Response to Comment 6-22.

Response to Comment 12-23

See Response to Comment 6-23.

Response to Comment 12-24

See Response to Comment 6-24.

Response to Comment 12-25

See Response to Comment 6-25.

Response to Comment 12-26

See Response to Comment 6-26.

Response to Comment 12-27

See Response to Comment 6-27.

Response to Comment 12-28

See Response to Comment 6-28.

Response to Comment 12-29

See Response to Comment 6-29.

Response to Comment 12-30

See Response to Comment 6-30.

Response to Comment 12-31

See Response to Comment 6-31.

Response to Comment 12-32

See Response to Comment 6-32.

Response to Comment 12-33

See Response to Comment 6-33.

Response to Comment 12-34

See Response to Comment 6-34.

Response to Comment 12-35

See Response to Comment 6-35.

Response to Comment 12-36

See Response to Comment 6-36.

Response to Comment 12-37

See Response to Comment 6-37.

Response to Comment 12-38

See Response to Comment 6-28.

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13. City of Westlake Village (P. Klessing)

Response to Comment 13-1

USEPA appreciates the watershed community's effort towards water quality improvement. In response to stakeholder's comments, USEPA has carefully considered the wasteload and load allocations necessary to protect water quality and aquatic life. As such, we expanded the discussion in the TMDL of the impairment observed in the Malibu Creek Watershed as a whole and the multiple point and non-point sources that need to be addressed.

Please see Response to Comment 1-2 for a more discussion on cost.

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14. City of Westlake Village (R. Taylor)

Response to Comment 14-1

The 2003 Nutrient TMDL for Malibu Creek Watershed addressed nutrient compounds that "exceed the water quality objectives (WQOs) for ***nuisance*** effects such as algae, odors, and scum (RWQCB, 1996)" (USEPA 2003). Specifically, the 2003 Nutrient TMDL addressed depressed dissolved oxygen and excess nutrient loads that resulted in "nuisance" impacts to recreational uses, including the negative visual and odorous presence of scum and algae. These were based on the much more limited information available at that time. The 2003 Nutrient TMDL did not address the beneficial use impairment linked to benthic macroinvertebrates. This TMDL is addressing impacts to the benthic macroinvertebrates in Malibu Creek and benthic community in Malibu Lagoon. For these reasons, and because the 2003 Nutrient TMDL wasteload allocations have been achieved in many instances, lower in-stream limits are established to protect the benthic biota, which are critical organisms supporting the bird and fish population and their habitat in the Watershed.

Furthermore, more extensive data and information are now available. USEPA must evaluate all available information during the development of a TMDL. Due to the different protection goals and greater data, USEPA expects that the current TMDLs, when fully implemented, will result in [a significant reduction] of algal cover, nutrient and sediment loading. This will improve the health of benthic macroinvertebrate communities and other dependent aquatic and wildlife in Malibu Creek and Lagoon. USEPA notes that it has identified nutrients and sedimentation as primary stressors for benthic macroinvertebrates, but that there are other secondary stressors which affect the health of benthic communities. Malibu Creek is a complex ecosystem, and with many other variables affecting the quality of habitat and health of aquatic organisms (e.g., altered hydrology, fire impacts, toxic pollutants, and invasive species), it is important that the State consider other authorities that are available to address the watershed impairments. The combination of all activities, including the implementation of this TMDL, will result in the successful restoration of these waters.

Finally, USEPA is not aware of any information suggesting that infrastructure improvements undertaken to meet existing discharge requirements would need to be torn out and replaced with different improvements to meet future discharge requirements.

Response to Comment 14-2

See Response to Comment 7-2.

Response to Comment 14-3

See Response to Comment 7-3.

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15. Clairidge Homeowners Association of Calabasas

Response to Comment 15-1

See Response to Comment 19-1.

Response to Comment 15-2

See Response to Comment 18-1.

Response to Comment 15-3

See Response to Comment 19-3.

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16. Community Association of Saratoga Hills

Response to Comment 16-1

See Response to Comment 19-2.

Response to Comment 16-2

See Response to Comment 18-1. The efforts completed by the JPA, primarily those leading to meeting the prohibition, have resulted in quantifiable improvements in water quality. The nitrate+nitrite, ammonia and phosphate concentrations have decreased consistently over the years, particularly during the summer prohibition period, when the Tapia WRF does not discharge into Malibu Creek. The efforts have also resulted in large-scale reuse of treated water in the Watershed, which has provided a tremendous water supply benefit and long-term water purchase savings for the Watershed.

Response to Comment 16-3

See Response to Comment 19-3.

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17. City of Calabasas

Response to Comment 17-1

See Response to Comment 14-1.

Response to Comment 17-2

See Response to Comment 7-2.

Response to Comment 17-3

See Response to Comment 7-3.

Response to Comment 17-4

USEPA agrees that it is important to consider the various requirements collectively. The referenced Los Angeles Regional MS4 Permit includes the existing State adopted and USEPA established TMDLs that were completed before December 2012. However, this TMDL is not included in the Los Angeles MS4 Regional Permit because the MS4 permit was adopted prior to the establishment of this TMDL. The commenter can provide implementation recommendations to the Los Angeles Regional Water Quality Control Board during the development of the implementation plan for this TMDL.

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18. Creekside Calabasas Park HOA

Response to Comment 18-1

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See Response to Comment 1-1.

Response to Comment 18-2

See Response to Comment 19-1.

Response to Comment 18-3

See Response to Comment 19-3.

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19. Bryan Reeder

Response to Comment 19-1

The timing of the public notice and comment period was a result of the schedule for establishment of TMDLs in the Los Angeles region required by the Heal the Bay Consent Decree . The amended consent decree required EPA to approve or issue the final TMDLs on the schedule by May 24, 2013, and the Malibu Creek and Lagoon TMDLs are the last of these TMDLs to be completed. After the close of the comment period, the environmental plaintiffs agreed to extend the deadline to July 2, 2013, in part because of the large number of comments received on the draft TMDLs. Based on the many detailed comments received, it appears that most commenters were able to review and comment on the draft TMDL within the timeframe.

Response to Comment 19-2

USEPA considered all available data from within the Malibu Creek Watershed. This TMDL acknowledges the brackish nature of the Watershed and does not apply freshwater standards. USEPA conducted an intensive evaluation of the particular characteristics of the Monterey/Modelo Formation and its potential impact on the water quality of Malibu Creek, benthic macroinvertebrates and the relevant benthic community variables (See Sections 8 and 9 of the TMDL for more detailed discussion). Our evaluation finds that portions of the Malibu Creek Watershed impacted by marine sediments of the Modelo/Monterey Formation show elevation of phosphorus levels, that portions of the Watershed located in the Monterey/Modelo Formation which are not affected by anthropogenic activities, exhibited, on average, “good” benthic macroinvertebrate conditions and low nitrogen and phosphorus concentrations, relative to impacted sites. USEPA found that it is the not mere presence of this geologic formation that

impacts the benthic community, but alterations and additions of pollutants that cause impairment to the benthic community.

Response to Comment 19-3

USEPA evaluated all available data sources, including those from NGOs, government agencies, cities, and municipalities. During analysis, we included all data that had consistent and recurring data points so that we could determine observable trends. The largest and longest data records were provided by the Heal the Bay Stream Team, Las Virgenes Municipal Water District, and larger technical reports by some cities (e.g., City of Calabasas) (Please see Section 7 and 8 for references to the extent of the source data sets). When evaluating these data sets, we also examined the methodology, collection standards, lab testing and QA/QC of the reported data. Fortunately, nearly all the data collection for water quality, benthic macroinvertebrates, and physical habitat followed the State's Surface Water Ambient Monitoring Program methodology. This allowed USEPA to compare the data sets collected by different entities. Furthermore, the benthic macroinvertebrate and physical habitat data collection and lab analyses were completed or directed by scientists from California Department of Fish and Game (CDFG). We understand that this portion of Heal the Bay's Stream Team data collection were often subcontracted or included the presence of CDFG (Personal Communication, Jim Harrington, CDFG). These data sets and the analysis have undergone strict scientific assessment and rigorous analysis, by other technical parties, i.e., the bioscores were reviewed, computed or directed, in part, by the Southern California Coastal Water Research Project scientists.

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20. Alan and Terry Utter

Response to Comment 20-1

See Response to Comment 19-1.

Response to Comment 20-2

See Response to Comment 19-2.

Response to Comment 20-3

See Response to Comment 19-3.

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21. Evelyne Combes

Response to Comment 21-1

See Response to Comment 19-1.

Response to Comment 21-2

See Response to Comment 19-2.

Response to Comment 21-3

See Response to Comment 19-3.

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22. Hans Sowa

Response to Comment 22-1

See Response to Comment 19-2.

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23. Stakeholders Implementing TMDLs in the Calleguas Creek Watershed

Response to Comment 23-1

Please see Response to Comment 4-1.

Response to Comment 23-2

Please see Response to Comments 1-G1 and 1-D7.

Response to Comment 23-3

Please see Response to Comments 4-4 and 9-8.

Response to Comment 23-4

Please see Response to Comments 4-3, 4-6, and 6-3.

Response to Comment 23-5

Please see Response to Comments 6-8 and 6-9.

Response to Comment 23-6

Please see Response to Comments 4-5.

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24. Chester and Joan Yabitsu

Response to Comment 24-1

The 2003 Nutrient TMDL for Malibu Creek Watershed addressed nutrient compounds that "exceed the water quality objectives (WQOs) for ***nuisance*** effects such as algae, odors, and scum (RWQCB, 1996)" (USEPA 2003). Specifically, the 2003 Nutrient TMDL addressed depressed dissolved oxygen and excess nutrient loads that resulted in "nuisance" impacts to recreational uses, including the negative visual and odorous presence of scum and algae. This TMDL addresses impairments to the benthic macroinvertebrates and relevant benthic community variables, which includes algae, sediment and nutrients.

We understood that the Las Virgenes-Triunfo Joint Powers Authority's $10 million investment covered facility upgrades to address the State's discharge prohibition for the summer period construction of denitrification capacity at the Tapia plant, as well as compliance with permit requirements that were derived from the 2003 Nutrient TMDL. Please see Responses to Comments 14-1 and 18-1.

Response to Comment 24-2

See Response to Comment 19-1.

Response to Comment 24-3

See Response to Comment 19-2.

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25. Jeff Miller, Homeowner

Response to Comment 25-1

See Response to Comment 19-1.

Response to Comment 25-2

See Response to Comment 19-2.

Response to Comment 25-3

See Response to Comment 19-3.

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26. Jess Ruf

Response to Comment 26-1

See Response to Comment 19-1.

Response to Comment 26-2

See Response to Comment 19-2.

Response to Comment 26-3

See Response to Comment 19-3.

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27. Joan Lavine

Response to Comment 27-1

USEPA cannot impose a moratorium on issuance of TMDLs, nor does USEPA believe that there is a reason to delay establishment of these TMDLs. Water quality sampling and testing has been conducted by several entities for a number of years. See Response to Comment 1-1. USEPA has reviewed the test methodologies and found them to be appropriate. Most of the data collected followed the State Water Resources Control Boards Surface Water Ambient Monitoring Program Methodologies for water quality and bioassessment monitoring and Quality Assurance Plan (http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml). Data older than five years remain relevant and are valuable for tracking long-term water quality trends in the watershed. TMDLs do not create restrictions on property rights or business or governmental operations, or prohibit any activities.

Response to Comment 27-2

USEPA is uncertain of the commenter's concern with regards to these TMDLs, which are established to address sedimentation and impairments on the benthic macroinvertebrate community in Malibu Creek and Lagoon and the watershed's main tributaries. The commenter refers to human sourced fecal material and appears to be addressing bacteria contaminants, which this TMDL is not addressing.

Response to Comment 27-3

Representing USEPA R9, Dr. Cindy Lin responded to the question asked by the commenter at the January 14, 2013 workshop at the USEPA Southern CA office. Dr. Cindy Lin answered the question in summary and stated that the details of the sampling efforts, including dates, locations, and data, were provided in the December 2012 Draft TMDL. The final TMDL includes the same information.

Response to Comment 27-4

USEPA is not aware of the events described in this comment. Whether or not they occurred does not affect the development of these TMDLs.

Response to Comment 27-5

The Clean Water Act identifies the USEPA and the State Water Board as the appropriate regulating entities to establish TMDLs and NPDES permits.

Response to Comment 27-6

A TMDL is not a discharge limitation, but instead identifies the quantity of a pollutant that may be introduced into a receiving water without exceeding applicable water quality standards, taking into account seasonal variations and a margin of safety. 33 U.S.C. § 1313(d)(1)(C). The Malibu Creek TMDLs recognize that there are multiple source of pollutants. The Los Angeles Co. Flood Control District decision does not appear to impose limitations on the establishment of these TMDLs.

Response to Comment 27-7

As explained in the Final TMDL, USEPA extensively evaluated the sources of nitrogen, phosphorus and sediment in the Malibu Creek watershed, and found both natural and anthropogenic sources of these pollutants. USEPA also found that in portions of the watershed which are mostly affected by natural sources, the benthic macroinvertebrate communities were healthy. The TMDLs do not determine which property owners (or other persons) are required to have NPDES permits.

Response to Comment 27-8

USEPA cannot impose a moratorium on issuance of TMDLs or NPDES permits. These TMDLs are based on a thorough evaluation of the extensive water quality studies that have been conducted within the Malibu Creek watershed. Therefore, we believe that this request has been addressed.

Response to Comment 27-9

USEPA expects that the implementation of these TMDLs will have a positive impact because they will improve water quality in Malibu Creek and Lagoon.

Response to Comment 27-10

The requested actions are not within the scope of the TMDL process. The Heal the Bay consent decree can only be modified by the court. Existing NPDES permits will remain in effect until they expire, or are otherwise modified, revoked and reissued, or terminated for cause. After the State approves an implementation plan for these TMDLs, any actions on NPDES permits for sources discharging to waters within the Malibu Creek watershed would be expected to contain discharge limitations based, in part, on these TMDLs, to the extent that they are applicable to the permitted discharges.

Response to Comment 27-11

USEPA provided notice that was reasonably calculated to reach interested parties by electronic mail to the Malibu Creek Watershed stakeholders (e.g., LVMWD; City of Malibu, City of Los Angeles County, County of Ventura and other cities in the Watershed), publication on the USEPA Region 9, website, and the State Water Resources Control Board's Lyris list serve, in accordance with USEPA's usual public notice procedures.

Response to Comment 27-12

USEPA senior staff transmitted an electronic copy of the consent decree to the commenter on January 25, 2013 by providing the weblink of the Calleguas Creek Watershed website where a copy of the consent decree is available, and on January 28, 2013 by providing an attachment of the pdf file.

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28. Joe and Debbie Chilco

Response to Comment 28-1

USEPA extended the public comment period to January 28, 2013 and provided a total of 47 days for comment period. See also Response to Comment 19-1.

Response to Comment 28-2

See Response to Comment 19-2.

Response to Comment 28-3

See Response to Comment 19-3.

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29. John M. and Sue Nan Douglass

Response to Comment 29-1

See Response to Comment 19-1.

Response to Comment 29-2

See Response to Comment 19-2.

Response to Comment 29-3

See Response to Comment 19-3.

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30. John Tommy Rosas, Tongva Ancestral Territorial Tribal Nation

Response to Comment 30-1

Comment noted. After the close of the comment period, the plaintiffs in the Heal the Bay Consent Decree agreed to extend the deadline to July 2, 2013. We recommend this issue be presented to the Los Angeles Regional board during the development of the Implementation Plan for this TMDL.

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31. Howard S. Kerner

Response to Comment 31-1

Some commenters questioned the applicability of the SC-IBI for Malibu Creek Watershed. To address this, USEPA computed the additional bioscores, CSCI, pMMI, and O/E, developed by the State Water Resources Control Board's Science Team to establish a statewide policy for biological objectives. The results show that when Malibu Creek Watershed's geologic characteristics, i.e., geologic predictor variables, are specifically factored in, the bioscores provide comparable results and conclusions as those observed with the SC-IBI bioscores. The Monterey/Modelo Formation, by itself, does not lead to lower benthic community condition, which indicates that other anthropogenic sources are causing the impairment. Please also see Response to Comment 7-2.

Response to Comment 31-2

Please see Response to Comment 19-1.

Response to Comment 31-3

USEPA is somewhat uncertain about the nature of the comment. It appears the comment is asking about how insects have an impact on larger creatures in Malibu Creek area. The aquatic insects, in all of their life history stages (e.g., adult, larvae, etc.) are a critical indicator of biological condition and water quality in in these waterbodies. Benthic macroinvertebrates are an important indicator of waterbody quality and used nationally as an established part of state and local entities' water quality program.

Response to Comment 31-4

For successful implementation of TMDLs, USEPA points to the adjacent Calleguas Creek Watershed where TMDLs have been adopted and implemented by the state. Since the implementation of the TMDL, improvements in monitoring and assessment have been observed. We also point to the Big Bear Lake Nutrient TMDL adopted by the Santa Ana Regional Board. This TMDL resulted in controls of in-lake nutrient loads and water quality improvement.

Response to Comment 31-5

The technical assessment and established wasteload and load allocations, when implemented, will result in water quality improvement and support of aquatic life, which is an important beneficial use for the public, as defined by the State. Please see also our Response to Comment 19-3.

Response to Comment 31-6

Comment noted.

Response to Comment 31-7

Comment noted. Thank you for your interest and comments.

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32. Southshore Property Owners Association

Response to Comment 32-1

See Response to Comment 19-2.

Response to Comment 32-2

See Response to Comment 18-1.

Response to Comment 32-3

See Response to Comment 19-3.

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33. Renaissance of Westlake Homeowners Association

Response to Comment 33-1

See Response to Comment 18-1.

Response to Comment 33-2

See Response to Comment 19-1.

Response to Comment 33-3

See Response to Comment 19-2.

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34. Las Virgenes Unified School District

Response to Comment 34-1

See Response to Comment 18-1.

Response to Comment 34-2

The 2003 Nutrient TMDLs were developed to protect the beneficial uses of recreation, including the negative and visual and odorous presence of scum and algae, based on the more limited information available at that time. The current TMDLs were developed to address impairments to benthic macroinvertebrates, and were based on a significant amount of additional data and analyses from more recent studies (see Sections 6, 7, 8 and Appendices A and E for more information). Excess algal growth, sedimentation and nutrient loading from various watershed sources can have a direct deleterious impact on habitat suitability for benthic macroinvertebrates. The more extensive information now available indicates that the 2003 Nutrient TMDLs did not control algae to the extent necessary to protect aquatic life and that nitrogen, phosphorus and sediment are still the key pollutants causing impairment of the benthic macroinvertebrate communities in Malibu Creek.

Please see Response to Comments 24-1.

Response to Comment 34-3

The science is addressed in depth in the TMDL. USEPA considered all of the available information and data, including those from NGOs, government agencies, cities, and municipalities. USEPA recognizes that there may be costs associated with meeting the newer standards, however, USEPA does not have information which suggests that wastewater treatment costs will be extraordinarily large. The wasteload allocations are set at levels that the Tapia WRF appears capable of meeting through improvements to the performance of the ***existing*** infrastructure. The JPA did not provide USEPA with information which

indicates that upgrades to reverse osmosis will be necessary. USEPA is not aware of any information suggesting that infrastructure improvements undertaken to meet existing discharge requirements would need to be torn out and replaced with different improvements to meet future discharge requirements. Please see Responses to Comments 19-3 and 1-1.

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35. Louise Donahue

Response to Comment 35-1

See Response to Comment 19-1.

Response to Comment 35-2

See Response to Comment 19-2.

Response to Comment 35-3

See Response to Comment 19-3.

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36. Malibou Lake Mountain Club

Response to Comment 36-1

See Response to Comment 19-1.

Response to Comment 36-2

See Response to Comment 19-2.

Response to Comment 36-3

See Response to Comment 19-3.

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37. Malibu Surfing Association

Response to Comment 37-1

See Response to Comments 8-1 and 8-2.

Response to Comment 37-2

Comment noted. USEPA has included the commenter's recommendation in Section 11 of the TMDL. See also Response to Comment 5-1.

Response to Comment 37-3

Comment noted. USEPA has included the commenter's recommendation in Section 11 of the TMDL. See also Response to Comment 8-6.

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38. Marcia Hanscom

Response to Comment 38-1

This TMDL addresses sedimentation and impairments to the benthic macroinvertebrates in Malibu Creek and tributaries. This TMDL does not address bacteria.

Response to Comment 38-2

Comment noted.

Response to Comment 38-3

USEPA recognizes the importance of the Monterey/Modelo Formation and extensively discussed its influence on water quality in the draft TMDL. The final TMDL expands the discussion based on additional information provided by, in part, by Dr. Orton. Please refer to Response to Comments 1-D8, 1-D12, 1-D39, 1-D43, and 1-D45, among others, for detailed discussion.

Response to Comment 38-4

Information on Malibu Lagoon Restoration and Enhancement Project, prepared by Dr. Travis Longcore was submitted to USEPA during the public comment period. Directed by the California Department of Parks and Recreation and the Santa Monica Bay Restoration Commission, the Malibu Lagoon Restoration and Enhancement Project is intended to increase circulation and improve dissolved oxygen conditions within the Malibu Lagoon. Dr. Longcore asserts the project is misguided, that Malibu Lagoon is naturally closed at most times, and that "Malibu Lagoon was historically and will in future tend to be brackish and prone to sedimentation and low dissolved oxygen."

USEPA disagrees with these comments. Malibu Lagoon naturally opens to the ocean on an intermittent basis, without a fully tidal salt marsh. This is presented in Section 6.3 of the TMDL.

. Malibu Lagoon has experienced significant morphological changes due to intentional filling and encroachment by buildings and parking lots (confirmed by Dr. Longcore), in addition to hydrologic regime changes in response to upstream development; these activities resulted in delivery of greater amounts of sediment into a smaller available footprint. Therefore, USEPA found, as have other studies (Ambrose and Orme 2000), that sedimentation is a significant potential stressor to the biological community at Malibu Lagoon.

This TMDL addresses impaired benthic community in Malibu Lagoon. The objectives of the TMDL are consistent with Dr. Longcore's recommendation "to promote native biodiversity at Malibu Lagoon." Based on USEPA's analysis, this may require controlling sedimentation and nutrient loading to better support healthy and diverse benthic community and habitat. USEPA does not suggest that the sediment TMDL will require converting Malibu Lagoon to a fully tidal salt marsh by use of dredged channels.

In general, USEPA supports the State's effort to restore Malibu Lagoon via the Restoration and Enhancement Project.

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39. Matthew Violette, Las Virgenes Park HOA

Response to Comment 39-1

See Response to Comment 19-1.

Response to Comment 39-2

See Response to Comment 18-1.

Response to Comment 39-3

See Response to Comment 19-3.

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40. Patricia McPherson

Response to Comment 40-1

See Response to Comment 38-1.

Response to Comment 40-2

See Response to Comment 38-2.

Response to Comment 40-3

See Response to Comment 38-3.

Response to Comment 40-4

See Response to Comment 38-4.

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41. Calabasas Highlands Homeowners Association

Response to Comment 41-1

See Response to Comment 19-1.

Response to Comment 41-2

See Response to Comment 18-1.

Response to Comment 41-3

See Response to Comment 19-3.

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42. Wendi Warner

Response to Comment 42-1

This TMDL addresses sedimentation and impairments to the benthic macroinvertebrates in Malibu Creek and tributaries. This TMDL does not address bacteria.

Response to Comment 42-2

Please see Response to Comment 42-1.

Response to Comment 42-3

Please see Response to Comment 42-1.

Response to Comment 42-4

Comment noted.

Response to Comment 42-5

Comment noted.

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43. Susan R. Ellis

Response to Comment 43-1

See Response to Comment 19-1.

Response to Comment 43-2

See Response to Comment 19-2.

Response to Comment 43-3

See Response to Comment 18-1.

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44. The Lakes At Lakeview Villas Homeowners Association

Response to Comment 44-1

See Response to Comment 18-1.

Response to Comment 44-2

See Response to Comment 19-1.

Response to Comment 44-3

See Response to Comment 19-3.

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45. First Neighborhood Property Owners Association

Response to Comment 45-1

See Response to Comment 18-1.

Response to Comment 45-2

See Response to Comment 19-1.

Response to Comment 45-3

See Response to Comment 19-2.

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46. Upper Terrace Homeowners' Association

Response to Comment 46-1

See Response to Comment 19-1.

Response to Comment 46-2

See Response to Comments 1-2 and 34-3.

Response to Comment 46-3

See Response to Comment 19-2.

Response to Comment 46-4

See Response to Comment 18-1.

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47. Las Virgenes Park Homeowners Association

Response to Comment 47-1

See Response to Comment 19-1.

Response to Comment 47-2

See Response to Comment 19-2.

Response to Comment 47-3

See Response to Comment 19-3.

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July 2, 2013

RESPONSE TO COMMENTS

This document includes USEPA's response to comments submitted in response to the December 12, 2012 Public Notice of the Draft Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to address Benthic Community Impairments. The comment letter submitted is provided on USEPA Region 9's website with highlighted comment notations added to the original letter at the end of each comment to identify the comment number (e.g., USEPA is responding to the specific comment immediately above the numbered "Comment" in red bold). Any change that is made to the TMDL in response to the comments is indicated in the response. If no change is noted in the response, then no change was deemed necessary in the TMDL. Please see (http://www.epa.gov/region9/water/tmdl/progress.html) for individual comment letters.

48. Wagon Road Ranchos

Response to Comment 48-1

See Response to Comment 18-1.

Response to Comment 48-2

See Response to Comment 19-1.

Response to Comment 48-3

See Response to Comment 19-2.