Total Maximum Daily Loads for Indicator Bacteria Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Technical Report

Appendix N

Responses to Public Comments

California Regional Water Quality Control Board
San Diego Region

June 11, 2008

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N.1 Introduction

This appendix to the Technical Report provides responses to public comments received on the draft documents for the project *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*. Draft documents distributed for public review and comment included the draft Technical Report, Tentative Resolution No. R9-2008-0027, and a draft Basin Plan Amendment. The draft documents were made available to the public for formal review and comment on February 22, 2008.

The California Regional Water Quality Control Board, San Diego Region (Regional Board) received written comments in letters and oral testimony given during the public hearing on April 9, 2008 from interested persons on the proposed TMDL. Individuals from the public that provided comments in writing and/or as testimony during the public hearing are listed in section N.2. Responses to comments and questions by members of the Regional Board during the April 9, 2008 public hearing are provided in section N.3. Responses to oral comments and testimony by members of the public during the April 9, 2008 public hearing are provided in section N.4. Written responses to written comments submitted by the public in advance of the April 9, 2008 public hearing are provided in section N.5.

N.2 List of Persons Submitting Comments and Testimony

- San Diego Coastkeeper
- City of Dana Point
- County of Orange
- US Environmental Protection Agency

N.3 Responses to Comments from Regional Board Members

Providing Written Responses to Comments from Stakeholders

Comment: During the April 9, 2008 Board meeting, Board members King and Ritschel expressed concern that the Regional Board was not responding to comments from the stakeholders in a timely manner.

> **Response**: Throughout the development of this TMDL, the Regional Board has responded to the questions and concerns of the stakeholders as soon as possible.
>
> When this project was initiated in 2004, a stakeholder advisory group (SAG) was formed to facilitate communication with stakeholders during the development of the TMDL. The SAG members included representatives from the municipalities, non-governmental organizations, and environmental interest groups. The SAG was involved in this project for several years before the TMDL was formally released to the public for review in February 2008 and given several opportunities to provide comments and feedback throughout the process. In December 2004, a technical memorandum (memo) was sent to all the SAG members informing them of the data

sets that were being used for the development of the models to be used for estimating bacteria loads from the watersheds and in the receiving water (please see Exhibit 1 at the end of this appendix). The memo also requested the SAG members to provide available data to fill identified data gaps or update the data sets listed in the memo, otherwise the gaps would be addressed with "technical assumptions based on literature or regional data analysis."

On May 23, 2005, a meeting was held with the SAG members to present the technical approach and provide the SAG members an opportunity to provide feedback and comments on the preliminary draft technical report, dated April 19, 2005, that was to be sent for scientific peer review. A second SAG meeting was held on June 30, 2005 to respond to the comments provided by the SAG members.

During the June 30, 2005 meeting, the Regional Board verbally addressed and responded to all the written and oral comments provided by the SAG members. At the meeting, the SAG members were informed that any SAG member interested in more detailed responses to comments submitted could set up an appointment or teleconference with the Regional Board. The SAG members were informed that written responses to the June 2005 comments would not be provided; however, SAG members could re-submit comments during the formal comment period to receive written responses if they were not satisfied with the oral responses. This was reiterated in the June 30, 2005 meeting notes, which were sent to all the SAG members soon after the meeting. At the June 30, 2005 meeting, SAG members were also informed that they had another opportunity to provide additional data that could be used to improve the models. Several SAG members provided additional data after the meeting.

Between July 2005 and December 2007, the draft technical report underwent scientific peer review and several revisions based on SAG member comments, on developments resulting from Bacteria TMDL Project I for Beaches and Creeks, and on the removal or delisting of several shoreline segments from the Clean Water Act section 303(d) List of Water Quality Limited Segments (303(d) List). In January 2008, the draft Technical Report was provided to the SAG members for their review and comment prior to releasing it to the public for formal public review and comment. A SAG meeting was held with the stakeholders on February 14, 2008 to discuss their comments. Those attending the SAG meeting were told that they should provide written comments during the formal public review process if they would like to receive written responses. At the time of the February 14, 2008 meeting, the SAG members had been involved with the development of this TMDL for over 3 years.

The draft Technical Report was formally released for public review and comment on February 22, 2008. At this time, the public (including the SAG members) were given an opportunity to formally provide written comments on the draft Technical Report. The public was given 48 days to review the documents before the April 9, 2008 public hearing. Written comments were requested to be submitted by April 3, 2008, six days before the April 9, 2008 Board meeting and public hearing, in order for those comments to be provided to the Board members before the meeting. The

purpose of the April 9, 2008 public hearing was only to hear comments and testimony on the proposed TMDL Basin Plan amendment, and no Board action was expected or taken.

As discussed above, comments that were submitted by the SAG members during the project development were responded to verbally, prior to the formal public comment period. As of April 9, 2008, all the formal public comments and testimony in advance of the public hearing have been submitted. These written responses were prepared for all written comments submitted during the formal public review and comment period to date (see section N.5) and the oral comments and testimony provided during the April 9, 2008 meeting (see section N.4). Throughout this process responses to comments from the stakeholders and the public were provided in a timely manner.

Accounting for Illegal Discharges in TMDL

Comment: During the April 9, 2008 Board meeting, Board members Wright, King and Rayfield expressed an interest in explicitly addressing illegal discharges (e.g., from boats and/or wastewater treatment plants) in the TMDL.

Response: There is an apparent concern that illegal discharges of sewage from boats and wastewater treatment plants are not being addressed or accounted for in the development of the TMDL. While illegal sewage discharges from boats and wastewater treatment plants are likely occurring, these discharges are not authorized or allowed.

The Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay and the unauthorized discharge of treated or untreated sewage to waters of the state. Adoption of a TMDL cannot include a WLA specifically for illegal discharges. This could potentially be interpreted as an authorization for these types of illegal discharges.

However, this TMDL does take illegal discharges into account in two ways:

As discussed in section 8 of the Technical Report, a TMDL is equal to the sum of the wasteloads allocation (WLAs) plus the sum of the load allocations (LAs) plus a margin of safety (TMDL = $\sum$ WLAs + $\sum$ LAs + MOS), where WLAs are portions of the TMDL that are assigned to point sources, and LAs are assigned to nonpoint sources.

When allocating portions of the TMDL to the known sources of bacteria, portions of the TMDL are assigned to allowable sources or uncontrollable sources. Discharges of sewage from boats and spills from wastewater treatment plants are neither legal nor uncontrollable. Assignment of a zero WLA or LA is the most stringent allocation possible and the only allocation that can be assigned to an illegal discharge in the context of a TMDL. So, in the case of the TMDLs for Shelter Island Shoreline Park and Baby Beach, the WLAs for illegal discharges from boats and wastewater treatment plants were set to zero (e.g., $WLA_{Boats} = 0$

and $WLA_{WWTP} = 0$). Bacteria that might originate from homeless persons is also illegal, so the LA for illegal discharges from homeless person was set to zero (e.g., $LA_{Homeless} = 0$). Therefore, the TMDL does account for bacteria originating from boats and wastewater treatment plants by assigning them a WLA of zero.

1. The TMDL includes an LA for natural and background sources. According to the text in section 8.2 of the Technical Report, the LA for natural and background sources includes "direct inputs from birds, terrestrial and aquatic animals, or *other unidentified sources* [emphasis added] within the receiving waters."

   Other unidentified sources could potentially include bacteria load contributions originating from illegal discharges from boats or wastewater treatment plants. Due to lack of data and resources, sources of "natural and background" bacteria were not quantified. In any case, identifying and quantifying the sources would not change how the TMDL would be allocated. However, potential contributions from boats and wastewater treatment plants could be considered accounted for in the LA for natural and background sources.

In the development of these TMDLs, illegal discharges from boats and wastewater treatment plants were identified as potential point sources of bacteria and assigned WLAs of zero. To the extent that illegal discharges from boats and wastewater treatment plants are occurring in reality, actions must be taken to reduce those discharges to zero. Actions may be taken by marina and harbor operators, the muncipalities, and/or the Regional Board to enforce the regulations that prohibit these types of illegal discharge.

The Technical Report has been revised to provide more information about how illegal discharges were specifically accounted for in the TMDL. Additionally, the Implementation Plan in the Technical Report has been revised to include additional discussion about what actions may be taken to address and eliminate these illegal discharges.

Value of Zero Wasteload Reduction Requirements to Comply with WLAs/TMDLs

Comment: During the April 9, 2008 Board meeting, Board members King and Rayfield questioned the value of developing a TMDL that has zero wasteload reductions required. Developing a TMDL for a waterbody that has a zero wasteload reduction seems to be a misuse of staff time and resources when other impaired waterbodies should have had higher priority.

Response: When the Bacteria TMDL projects were first initiated in 2003, addressing the recreational beneficial uses of the waterbodies that were listed as impaired by indicator bacteria was a high priority for the TMDL Program. At the time, the water quality data indicated that there were frequent exceedances of the indicator bacteria water quality objectives that support the recreational water contact (REC-1) beneficial uses in many waterbodies. Many beaches up and down the coast of the San Diego Region were frequently closed or had warning signs posted

because of elevated bacteria levels. The Regional Board gave direction to develop TMDLs for the bacteria-impaired waterbodies in the Region.

Before the models were developed and completed, the calculation of a zero wasteload reduction for MS4 discharges was not anticipated. In 2003 and 2004, available data indicated that there were elevated bacteria levels in these receiving waters warranting the listing of these waterbodies on the 2002 303(d) List. In most cases, elevated bacteria levels are associated with anthropogenic activities, and urban runoff is often suspected as one of the primary sources contributing to the impairments.

For Baby Beach, zero wasteload reductions were calculated for MS4 discharges for total coliform and fecal coliform bacteria under the wet weather TMDLs. For Shelter Island Shoreline Park, zero wasteload reductions were calculated for MS4 discharges for total coliform, fecal coliform, and *Enterococcus* bacteria under wet weather and dry weather conditions. These zero wasteload reductions mean that the discharges from the MS4s are not expected to cause an exceedance in water quality objectives for the given indicator bacteria and hydrologic regime (i.e., wet weather or dry weather). However, the loads from the MS4s must be the same or less than what was estimated in the load calculations and assigned as WLAs in the TMDLs. Any exceedances in water quality objectives caused by wasteloads originating from the MS4s will mean that the MS4 discharges are no longer in compliance with the WLAs and TMDLs.

The current available data, at least for Shelter Island Shoreline Park, appear to justify the zero wasteload reduction requirements. Based on the watershed loads estimated by the models and the calculated TMDLs under wet and dry weather, no wasteload reductions are required for Shelter Island Shoreline Park under the critical conditions. This is reasonable considering the watershed area that was modeled consists entirely of park/recreation land use and is a very small area relative to the size of the receiving water.

Additionally, the water quality data collected at Shelter Island Shoreline Park since 2003 have shown a strong trend of improved bacteria levels. Prior to 2003, the San Diego Unified Port District suspected illegal sewage discharges from one or more boats moored directly off the Shelter Island Shoreline Park shoreline. The San Diego Unified Port District conducted surveillance to identify any boats that might be discharging illegally. No boats were identified by the surveillance program. However, since the conclusion of that program, indicator bacteria REC-1 water quality objectives have been met consistently. Furthermore, the San Diego Unified Port District has implemented several BMPs such as street sweeping and covering garbage cans to reduce bacteria loading at Shelter Island Shoreline Park. Therefore, assuming there are no longer any illegal boat discharges, the MS4 does not appear to be causing elevated bacteria levels in the receiving water. The modeling approach and its results appear to have correctly predicted the current outcome. Therefore, Shelter Island Shoreline Park MS4 discharges do not appear to cause elevated bacteria levels and a zero wasteload reduction for MS4 discharges appear to be correct.

A TMDL project that presents zero wasteload reductions may appear as if a TMDL was not required or that limited resources were not spent wisely. These waterbodies, however, have historically had elevated bacteria levels, and measures were needed to correct the problem. This project and process has resulted in significant and measureable improvements in water quality. Originally, this project included 6 bacteria-impaired shoreline segments in Dana Point Harbor and San Diego Bay. Since these waterbodies were listed in 2002 and the bacteria TMDL projects were initiated in 2003, the municipalities have actively implemented several measures and collected data to begin the process for complying with the TMDLs, resulting in the removal or delisting of 4 of the original 6 impaired shorelines from the 303(d) List. For the remaining 2 shorelines, Baby Beach and Shelter Island Shoreline Park, the efforts of the municipalities have resulted in significant improvements in water quality.

N.4 Responses to Oral Public Comments and Testimony

Members of the public were given an opportunity to provide oral comments and testimony during the April 9, 2008 public hearing. Only oral comments that were not duplicated in written comments are presented in this section.

Oral Comment 1
(*US Environmental Protection Agency*)
During the April 9, 2008 Board meeting, the US Environmental Protection Agency requested that the Implementation Plan be revised to include more details about monitoring, actions that would be taken for unexpected loadings, and differences in implementation with Bacteria TMDL Project I for Beaches and Creeks.

Response: The Implementation Plan in the Technical Report has been revised to include more details and discussion about the monitoring that may be expected and actions that may be taken by the Regional Board to address illegal discharges or other unexpected loadings, and a discussion about the differences in implementation between this TMDL project and Bacteria TMDL Project I for Beaches and Creeks.

Oral Comment 2
(*County of Orange*)
During the April 9, 2008 Board meeting, the County of Orange suggested that the Implementation Plan include more recognition of the efforts taken by the County of Orange and City of Dana Point in addressing the elevated bacteria levels at Baby Beach.

Response: The Regional Board requested the County of Orange and City of Dana Point to provide recommendations for revising the Technical Report and Implementation Plan text to better acknowledge the efforts previously implemented and currently being implemented. The text of the Implementation Plan, as well as

other parts of the Technical Report, were revised to incorporate recommended revisions provided by the County of Orange and City of Dana Point determined to be appropriate.

Oral Comment 3

(*County of Orange*)

During the April 9, 2008 Board meeting, the County of Orange expressed concern that adoption of the TMDLs would open the County of Orange to third party lawsuits.

Response: The development of TMDLs is required under federal law, pursuant to Clean Water Act section 303(d). TMDL implementation plans are required under state law. State law requires that a TMDL include an implementation plan since a TMDL supplements, interprets, and/or refines existing water quality objectives.

According to Water Code section 13050(j), Basin Plans must have a program of implementation to achieve water quality objectives. According to Water Code section 13242, the implementation plan must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the water quality objectives. Assuming that the dischargers comply with the WLAs and LAs in the TMDLs within the schedule of compliance provided in the Implementation Plan and continue to do so, they will not be subject to third party lawsuits.

If the dischargers cannot comply with the WLAs and LAs in the TMDLs within the schedule of compliance provided in the Implementation Plan, not only will they be subject to third party lawsuits, they will also be subject to enforcement action by the Regional Board. Failure by the dischargers to comply with the WLAs and LAs and failure by the Regional Board to enforce compliance with the TMDLs would also open the Regional Board to third party lawsuits.

Oral Comment 4

(*City of Dana Point*)

During the April 9, 2008 Board meeting, the City of Dana Point pointed out that there was no discussion of the planned Reference System and Antidegradation Approach / Natural Sources Exclusion Approach (RSAA/NSEA) Basin Plan amendment. The City suggested that the Technical Report should include a reference to this Basin Plan amendment.

Response: If all anthropogenic sources of bacteria are controlled and natural and background sources appear to be the sole source of continued impairment, the NSEA may be applied. A discussion of the RSAA/NSEA Basin Plan amendment was included in the Implementation Plan in the Technical Report and its potential applicability for these TMDLs.

N.5 Responses to Written Public Comments

Written comments were submitted by San Diego Coastkeeper and County of Orange. The comment letters were not reproduced in this document. Written comments are provided verbatim from the letters. Several of these comments were also presented as oral comments and testimony during the April 9, 2008 public hearing. The comments are numbered sequentially below. Under each comment number is the source of the comment and the date of the comment.

Written Comment 1
(*San Diego Coastkeeper letter, dated March 28, 2008*)
Reasoning for Zero Existing Wasteload and Wasteload Allocation for SISP Dry Weather is Unclear
We are uncertain, after reading the Technical Report and the Appendices why the existing wasteload and wasteload allocation for SISP dry weather is zero. The Technical Report states that the model used to calculate bacteria loads from urban runoff did not correctly predict observed loads. As a result, a back-calculation of the allowable loading from nonpoint sources, accounting for allowable dry weather urban runoff loads predicted by the model, was performed. (Technical Report, p. 44-45) However, the justification for such analysis is not given. It is unclear why a model that is inadequate for predicting dry weather urban runoff loads should be relied upon. As stated in the Technical Report, further studies should be conducted to identify and quantify sources that may be contributing to bacteria loads. Attributing all existing bacteria loads to natural sources seems unjustified without further analysis or supporting data. (*Id*. at. 45)

Response: A zero existing wasteload means that the model predicts that no bacteria load is expected under critical conditions. A zero wasteload allocation (WLA) means that no part of the TMDL has been allocated to that particular point source.

In the case of Shelter Island Shoreline Park, the dry weather model predicts that no bacteria load is expected from the watershed under the critical dry weather conditions. This is reasonable considering the watershed area that is modeled consists entirely of park/recreation land use. This land use is not expected to have dry weather nuisance flows associated with human activities, such as over-irrigation or car washing, like residential, commercial or industrial land uses.

If no load is expected from the watershed under dry weather conditions, then there was no basis to assign any part of the dry weather TMDL as a WLA to the MS4. Therefore, the WLA for MS4s is zero in the dry weather TMDLs for Shelter Island Shoreline Park.

Written Comment 2

(*San Diego Coastkeeper letter, dated March 28, 2008*)

Clarification for the Lack of Consideration of Illicit Discharges from Boats in Determining Wasteloads

Because illicit discharges from boats in both SISP and Baby Beach are illegal, they are not quantified in the TMDL. However, the Technical Report acknowledges that such discharges are a potential source of bacteria in receiving waters. (*Id*. at 27) As a significant potential threat, such discharges may not be easily quantified, but it is unclear why they should be wholly discounted. Likewise, sewage spills from wastewater treatment plants should be taken into account. Though sewage spills and illicit discharges from boats should not occur, in reality they do. Coastkeeper suggests incorporating such sources into an explicit margin of safety in order to capture them within the TMDL. In addition, more information about the predicted loading potential from sewage spills and illicit discharges from boats would be helpful in determining how to account for such sources.

Response: The responses for comments from Regional Board members in section N.3 also address this comment.

Written Comment 3

(*San Diego Coastkeeper letter, dated March 28, 2008*)

Unclear why a TMDL that Results in a Zero Percent Decrease is Useful

Coastkeeper would like clarification for the reasoning behind the adoption of the SISP wasteload reductions. All reductions attributable to SISP are zero under the proposed TMDL. Further, incorporation of the TMDL into the NPDES permit will likely be preceded by the removal of SISP from the Clean Water Act 303(d) list, according to the Technical Report. (*Id*. at 66) Therefore, we ask that clarification for adoption of such reductions on the suggested timeline be given.

Response: A zero percent load reduction to meet the WLA for MS4s means that the model predicts that the bacteria loads are not expected to cause an exceedance in the water quality objectives (WQOs) that will support the water contact recreation (REC-1) beneficial use in the receiving water. A zero wasteload reduction does not mean that the municipalities responsible for discharges from MS4s are not required to meet the WLA. If the bacteria load from the Shelter Island Shoreline Park watershed does in fact cause an exceedance of REC-1 WQOs in the receiving water, those loads would require a reduction to comply with the WLA assigned to the MS4. Based on data provided by the San Diego Unified Port District, the water quality appears to have improved significantly since the 2003. If the trend continues, continued collection of water samples should provide enough data to support the delisting of Shelter Island Shoreline Park from the Clean Water Act section 303(d) List of Water Quality Limited Segments (303(d) List).

However, if the water quality begins to degrade, or the data collected do not support delisting Shelter Island Shoreline Park by 2012, the Regional Board may issue an investigative order as authorized under Water Code sections 13267 and 13383 to

require the municipalities to identify the sources of bacteria that are causing the continued exceedances in REC-1 WQOs and recommend and implement measures to eliminate those exceedances. The Implementation Plan in the Technical Report has been revised to provide more information about what actions may be taken to address failures to meet the REC-1 WQOs within the given compliance schedules.

Written Comment 4

(*County of Orange letter, dated April 3, 2008*)

We have attached our prior comments dated June 2, 2005. It should be noted that no response to these comments has been forthcoming.

Response: Responses to these comments were provided verbally during the June 30, 2005 meeting with the Stakeholder Advisory Group (SAG), which was attended by the County of Orange.

The June 2, 2005 comments were submitted after the County of Orange reviewed the April 19, 2005 preliminary draft of the Technical Report that was only provided to members of the SAG. The purpose of the review was to receive input to revise the preliminary draft Technical Report prior to the submittal to the scientific peer reviewers. The SAG members were informed that verbal responses to their comments would be provided at the June 30, 2005 SAG meeting.

During that June 30, 2005 SAG meeting, verbal responses were provided to the June 2005 written comments submitted for the preliminary draft Technical Report. The SAG members were informed at the meeting that any SAG member interested in more detailed responses to comments submitted could set up an appointment or teleconference. The SAG members were also informed that written responses to the June 2005 comments would not be provided; however, SAG members could re-submit comments during the formal comment period to receive written responses. This was reiterated in the June 30, 2005 meeting notes, which were sent to all the SAG members soon after the meeting.

Given the length of time between the June 30, 2005 SAG meeting and the release of the February 22, 2008 draft Technical Report, the County of Orange may not recollect the verbal responses that were provided. Because the June 2, 2005 comments were submitted during the public comment period with the formal April 3, 2008 comments, written responses are provided in this document.

Written Comment 5

(*County of Orange letter, Attachment A, Comment 1, dated April 3, 2008*)

Executive Summary, Page 1, Third Paragraph: The TMDLs established in this technical report relate to water quality objectives for REC-1 and REC-2 beneficial uses not shellfish harvesting. As noted in the third paragraph, SHELL beneficial use will be addressed in a separate TMDL and/or standards action. To prevent confusion to the reader, references to shellfish harvesting beneficial uses should be removed from the document.

Response: The shellfish harvesting (SHELL) beneficial use reference was deleted from the Executive Summary. The SHELL beneficial use references in sections 1 and 2 of the Technical Report were not deleted because the SHELL beneficial use is pertinent to the discussions.

Written Comment 6

(*County of Orange letter, Attachment A, Comment 2, dated April 3, 2008*)
Section 1 Introduction, Page 5, Second Paragraph: The document states, "The bacteria loads from the watershed were used as inputs into a second model used to calculate the assimilative capacity of receiving waters at the impaired BB and SISP shorelines". This text should be revised to reflect that the bacteria loads were modeled based upon land use area and that the actual bacteria loads from the MS4 systems are not known.

Response: The sentence has been revised to state that the bacteria loads *calculated by the watershed model* were used as inputs into the receiving water model.

Written Comment 7

(*County of Orange letter, Attachment A, Comment 3, dated April 3, 2008*)
Section 1.1 Technical Approach, Page 7, Fifth Paragraph: The document states, "For these TMDLs, the receiving waters are the impaired shoreline segments of BB and SISP, and the watersheds are the areas of the watershed that drain directly to those receiving waters." This does not match with text in other parts of the document which define the watershed area for Baby Beach as 522.6 acres or the entire watershed for Dana Point Harbor and not just the watershed area to the impaired shoreline segment of Baby Beach.

Response: The sentence has been revised to state that the receiving waters are Dana Point Harbor and San Diego Bay, and the watersheds are areas of the watershed that are conservatively assumed to have a potential impact on the impaired shorelines of those receiving waters.

Written Comment 8

(*County of Orange letter, Attachment A, Comment 4, dated April 3, 2008*)
Section 2.1 Project Area Description, Page 11, Second Paragraph: The document states, "Impairment of these shorelines is likely due to local sources of bacteria such as human, domestic animals and urban runoff." This statement does not appear to be correct based upon 2003 studies and conflicts with the text in Section 5.1.1 Natural Sources, Page 26, Third Paragraph, which states that for both wet and dry weather fecal bacteria deposited from waterfowl may be the primary source or a relatively significant source of impacts to the shorelines.

Response: There is no conflict between the statements from section 2.1 and section 5.1.1. Natural and background sources (including fecal bacteria deposited by waterfowl) are a significant source of bacteria. Natural and background sources

are not expected to cause exceedances in REC-1 WQOs. For Baby Beach, exceedances in REC-1 WQOs are not expected to occur based solely on natural and background sources without the bacteria loads from the watershed (i.e., MS4s), and assuming no illegal discharges are occurring within the immediate vicinity of the shorelines

According to the June 2003 State of the Beach Report for Baby Beach, "[t]he most significant contributor of bacteria [at Baby Beach] appeared to be the storm drains." The statement that, "Impairment of these shorelines is likely due to local sources of bacteria such as human, domestic animals and urban runoff" is supported by the June 2003 State of the Beach Report.

Written Comment 9

(*County of Orange letter, Attachment A, Comment 5, dated April 3, 2008*)

Section 2.1 Project Area Description, Page 11, Fourth Paragraph: The 522.6 acre watershed described in Table 2-1 includes drainages for all of Dana Point Harbor. This is an incorrect depiction of the drainages to the Baby Beach shoreline. A review of grading and development plans (Dana Point Headlands Project Hydrology Exhibit, Stantec Consultants, Inc. 2/15/2007, Ocean Institute BMP Evaluation Site Plan, RDMD 11/26/2002, Dana Point Harbor Parking Lot No. 2 Grading and Paving Plan, Koebig & Koebig, Inc. September 1971), for the area surrounding Baby Beach defines a drainage area of only 43.4 acres (see Attachment B). In addition, harbor water quality monitoring data and circulation studies indicate that bacteria impairment is confined to the Baby Beach shoreline and that limited circulation exists between the waters near to Baby Beach and the waters further in the harbor channel. The Baby Beach bacteria TMDLs were developed based upon modeling results driven by watershed size and land use. The use of a watershed area representative of the actual inputs that drain to the segment of impaired shoreline is imperative to accurate model TMDL development. The watershed area used in the model should be revised to reflect the actual drainage area to Baby Beach and the TMDLs should be revised accordingly.

Response: The circulation study referred to by the commenter took place over a 2-day period in September 2002. According to the March 2003 Circulation Study Report for Baby Beach, "it appears that there was limited circulation between the waters near to Baby Beach and the waters further in the channel." However, the report also states that the direction of flow at the harbor channel adjacent to Baby Beach (Station 8) "appeared to be strongly influenced by winds and tides with surface flows predominantly in the direction of the tidal flow." Additionally, the report states that wind and wave patterns can vary significantly throughout the year, particularly during seasonal shifts in weather patterns and additional studies would be required to evaluate currents under variable conditions.

All the areas of the watershed that drain into Dana Point Harbor were assumed to potentially have an influence on the bacteria levels along Baby Beach. This is the most conservative assumption and the most accurate way to represent the watershed inputs into the receiving water model.

Written Comment 10
(*County of Orange letter, Attachment A, Comment 6, dated April 3, 2008*)
Section 2.3 Impairment Overview, Page 15, Second Paragraph: The document states, "For this project, the most recent water quality data available at the time of the model development in 2004 were used to develop the models." Based upon the data sources listed in Appendix D only Baby Beach water quality data from 11/1996-10/2002 was used. Therefore, water quality data from 10/2002 to 2004 was not used and neither was the extensive data collected as part of the June 2003 State of Beach Report which included a data mining study, circulation study, and special bacteriological studies conducted at Baby Beach. The document should be revised to reflect what data was actually used for modeling. This comment also applies to document text in Section 4.1.1, Page 20, First Paragraph.

Response: Much of the data from the data mining study included in the June 2003 State of the Beach Report were also used in the model. The data mining study had tidal, rainfall and water quality data from January 1997 to April 2002. These data were collected from the same sources that were used for model development. The circulation study and special bacteriological studies, however, were both inconclusive and could not be used in the model development.

The data collection and model development were initiated in January 2004. The County of Orange was given an opportunity to provide additional data. A memo from the Regional Board was sent to the SAG members, dated December 10, 2004, listing the data sets that were used in the model and requesting additional data if available. The County of Orange was also given an opportunity to provide additional data in June 2005. The County of Orange made a reference to the June 2003 State of the Beach Report, but did not provide any of the raw data.

The data used to develop the watershed and receiving water models are as shown in Appendix D to the Technical Report. Because 2001 and 2002 had the most complete hydrology/hydraulics data, the water quality data collected in 2001 and 2002 were used to calibrate and validate the water quality model. Water quality data collected after 2002 would not have been used in the calibration or validation of the water quality model.

The model was set up, calibrated, and validated assuming that either there were no BMPs in place, or that the BMPs in place were not effective in controlling bacteria loads entering Dana Point Harbor. The use of 2001 and 2002 hydrologic and water quality data is appropriate because the water quality during this time period exhibited high frequencies of REC-1 WQO exceedances. Since Baby Beach was placed on the 2002 303(d) List the municipalities have implemented several structural and non-structural BMPs that have apparently resulted in measureable improvement in water quality at Baby Beach. To use the water quality data from after 2002 and after the effective BMPs had been implemented, the model would have to be set up, calibrated and validated with the new BMPs accounted for in the model. This might reduce the amount of existing bacteria load that may be entering

the receiving water, but it would not reduce the TMDLs for the receiving water which are calculated based on the REC-1 WQOs.

However, as discussed in section 2.3.1, water quality data collected from Baby Beach between January 2002 and December 2006 were evaluated to confirm that the impairment continues to exist. The water quality data from this time period appears to indicate that water quality has improved since 2002, but also confirms that Baby Beach remains impaired by indicator bacteria.

Written Comment 11

(*County of Orange letter, Attachment A, Comment 7, dated April 3, 2008*)
Section 3, Numeric Target Selection, Page 17: Similar to the Bacteria Impaired Waters – Project I Beaches and Creeks TMDL, this section of the document should be revised to include reference to the pending Reference System & Antidegradation Approach (RSAA) and Natural Sources Exclusion Approach (NSEA) Basin Plan Amendment (BPA) and explain its implications to the Baby Beach and Shelter Island Shoreline Park TMDLs. In particular, the NSEA seems appropriate to the situation at Baby Beach were studies point toward birds, sediment resuspension, and other natural sources as the likely source of impairment.

Response: Discussion of the Natural Sources Exclusion Approach (NSEA) would not be appropriate in section 3, which discusses the selection of numeric targets. The NSEA would only apply after evidence can be provided that all anthropogenic sources of bacteria have been controlled and the REC-1 WQOs are still being exceeded.

The Implementation Plan in the Technical Report has been revised to provide more information about the NSEA and when it may be applicable.

Written Comment 12

(*County of Orange letter, Attachment A, Comment 8, dated April 3, 2008*)
Section 4.1.2 Waterbody Characteristics, Page 20, Third Paragraph: The hydrology component of the model developed as part of the Bacteria TMDL Project I and now utilized as part of the San Diego Bay and Dana Point Harbor TMDLs involved a calibration using thirteen USGS gages throughout the San Diego Region for wet weather and a combination of gage data from a tributary to San Juan Creek and instantaneous flow measurements from stations in Aliso Creek and Mission Bay drainages for dry weather. The use of these data sources is inappropriate for determining loading and TMDLs for Baby Beach for the following reasons:

a) The thirteen USGS gage stations are located along much larger drainages (13,632 - 462,720 acres) that have different hydrology than the small storm drain system at Baby Beach (43.4 acres). Factors such as ground water input within a creek and longer wet weather sustained flows are not components of a small, concrete lined, underground MS4 system like the one found at Baby Beach. In addition, many of the USGS gage stations used have upstream reservoirs and lakes that may regulate or

partially regulate flow. This adds another layer of uncertainly to using this data to simulate flows in a small MS4 system.

b) The instantaneous flow data used from the Aliso Creek Watershed was only "estimated" flow. Caution should be taken in using this data because the methods used to determine flow (e.g. the floating leaf method) have inherent error. The fact that these flow approximations were used to develop a regional model and that these models were used to develop TMDLs is a concern.

To address these two issues a better description of the limitations of the flow data used to develop these models should be presented in the document. In addition, some recent flow data is available from the diversion system BMP in place for the Dana Point Headlands area which drains to the west end of Baby Beach. This data could be used to calibrate model derived dry weather flows to those actually observed within the Baby Beach drainage area.

Response: Ideally, calculation of bacteria loads from a watershed would be based entirely on actual site specific data. At the time the modeling approaches were developed in 2004, there were no flow or water quality data available for the storm drains discharging to Dana Point Harbor. The County of Orange was provided several opportunities to provide more site specific data, but never provided any data. Given the lack of site specific flow and water quality data for the storm drains discharging to Dana Point Harbor, a modeling approach was required.

As with any modeling approach, there is inherent uncertainty since no model can fully represent reality. The uncertainty in using a model is acknowledged in section 6 in the Technical Report.

Even though there is a degree of uncertainty in the models, the watershed modeling approaches used have been shown to be able to estimate/simulate flows and bacteria loads well for several different watershed sizes in the San Diego Region for Bacteria TMDL Project I, as well as in the Los Angeles and Santa Ana Regions. The degree of uncertainty appears low. The watershed modeling approaches used in this project are on the high end of complexity and used large data sets from across the San Diego Region in their development. The alternative to the modeling approaches used in this project would be to use simpler models with more assumptions that would result in even higher levels of uncertainty. Given the lack of site specific data and the availability of the regionally calibrated watershed models, the uncertainty that is in the modeling approaches used is less than the alternative of using other simpler modeling approaches with more assumptions.

Written Comment 13

(*County of Orange letter, Attachment A, Comment 9, dated April 3, 2008*)

Section 4.1.2 Waterbody Characteristics, Page 21, First Paragraph: More information should be provided regarding the resolution and the date of the bathymetry data used for Baby Beach. The USGS DRG 7.5 min quadrangle map for Dana Point provides some limited data on depth curves and depth sounding locations for coastal areas, but dates back to 1975 and does not provide detailed bathymetry. The use of this data to

create an accurate receiving water model for Dana Point Harbor does not seem appropriate. In addition, dredging is regularly performed in the harbor every 5-7 years to maintain navigable depths and widths making it uncertain whether the data used reflects the conditions during the time period of the water quality modeling data used. More accurate Dana Point Harbor bathymetry data is and has been available from the County and should be used to update the receiving water model.

Response: The bathymetry data used for the model was provided by the US Army Corps of Engineers (USACE) from 1999. The County of Orange was informed that this is the bathymetry data that would be used in the December 10, 2004 Regional Board memo to the SAG members. The County of Orange failed to object or raise concerns with the bathymetry data in their June 2, 2005 SAG comments. The County of Orange also did not raise any concerns during the February 14, 2008 SAG meeting, and did not provide any objections that the bathymetry data were not acceptable until its April 3, 2008 comment letter.

The 1999 bathymetry data came from a period very close in time to the 2001 and 2002 period of time for which the models were calibrated and validated. The bathymetry data used were adequate for model development. Appendix D has been revised to provide a more specific date and source of the bathymetric data used for Baby Beach.

Written Comment 14
(*County of Orange letter, Attachment A, Comment 10, dated April 3, 2008*)
Section 5 Source Analysis, Page 25, Second Paragraph, Last Line: Remove extra "s" after approaches.

Response: The text has been corrected as recommended. Typographical and grammatical errors throughout the document will be corrected as necessary.

Written Comment 15
(*County of Orange letter, Attachment A, Comment 11, dated April 3, 2008*)
Section 5.1 Nonpoint Sources, Page 25, Fourth Paragraph: Homeless encampments are not believed to be a source of impairment to Baby Beach by either the County or City of Dana Point. Additional justification and information should be provided to support the statement that encampments from homeless persons is a potential nonpoint source of bacteria at Baby Beach or the document should be revised removing homeless encampments as a potential source.

Response: The likelihood that encampments of homeless persons being a source of bacteria contributing to the impairment at Baby Beach is probably low. Open areas and areas open to the public, however, can be frequented by homeless or transient persons. Additionally, this project not only addresses Baby Beach, but includes Shelter Island Shoreline Park as well. Homeless and transient persons have been observed at Shelter Island Shoreline Park on several occasions. Thus,

homeless encampments are a potential source that cannot be completely ignored and shall remain in the source analysis.

Written Comment 16
(*County of Orange letter, Attachment A, Comment 12, dated April 3, 2008*)
Section 5.1.1 Natural Sources, Page 26, Fourth Paragraph: This section of the document does not identify wrack line or sediment regrowth as potential nonpoint sources of bacteria. As noted later in the document, (Section 10.7.2, Page 77, Paragraph 2) studies have found that bacteria multiply in the wrack line on the beach during low tide and this can cause exceedances during high tide when the wrack is inundated. The June 2003 State of the Beach Report for Baby Beach and continued studies by the Orange County Health Care Agency have also identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach. Descriptions of both these natural sources should be added to this section of the document.

Response: The last paragraph of section 5.1.1 states that other sources of bacteria in the water, such as aquatic plants and wildlife, may contribute to the bacteria levels within the receiving water during both wet and dry weather conditions. Wrack are aquatic plants.

Sediments may also be a potential source, which could be included in the natural sources. In the case of Baby Beach, the June 2003 State of the Beach Report stated that, "Transect studies extending from the west storm drain further confirmed that concentrations of indicator bacteria (particularly enterococci) in sediments and water samples were highest near the drain and decreased with distance from this apparent source area." This statement appears to indicate that the bacteria in the sediment is not naturally occurring, and originates from the storm drain.

Section 5.1.1 has been revised to include sediment as another potential natural source within the receiving water. If the impairment at Baby Beach is caused by re-growth and resuspension of bacteria near the shoreline, this would not be considered a natural source if the bacteria and sediments originated from the storm drain.

Written Comment 17
(*County of Orange letter, Attachment A, Comment 13, dated April 3, 2008*)
Section 5.1.2 Encampments (Homeless Persons), Page 26, Fifth Paragraph: See comment #11.

Response: Please see the response to previous comment 15.

Written Comment 18
(*County of Orange letter, Attachment A, Comment 14, dated April 3, 2008*)
Section 5.2.3 Municipal Separate Storm Sewer Systems (Urban Runoff), Pages 27 & 28, Last Paragraph: Please clarify if the "direct linkage" that has been established

between human illness and recreating near the outfalls of urban stormwater conveyance systems is applicable to the Baby Beach situation where there are no sewage inputs or whether the said study was conducted in areas where sewage inputs were quantified and therefore is not applicable to this area. The reference provided for this are issued permits not scientific studies.

Response: The appropriate reference has been made to be the article entitled "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff" (Haile et al, 1999). The article states that there was a direct correlation between swimming related illnesses and densities of indicator bacteria originating from heavy urban runoff discharged from storm drains.

Written Comment 19
(*County of Orange letter, Attachment A, Comment 15, dated April 3, 2008*)
Section 6.1.1.2 Source Contributions, Page 31, Fourth Paragraph: Correct typographical error "poosible".

Response: Please see the response to previous comment 14.

Written Comment 20
(*County of Orange letter, Attachment A, Comment 16, dated April 3, 2008*)
Section 7.2.3 Dry Weather Load Calculations, Page 43, Second Paragraph: The analysis of dry weather load calculations does not take into account that the west end and east end storm drains to Baby Beach were plugged with inflatable seals during the dry season from 1997-2002. The TMDL model utilized Baby Beach water quality data from 11/1996-10/2002 for calibration. This data was collected during the period the plugs were in place, therefore, its use for the calibration of watershed MS4 systems loading into Baby Beach is flawed. Dry weather load calculations should be adjusted to reflect site conditions (no MS4 inputs) during the modeling data period.

Response: According to the June 2003 State of the Beach Report, the plugs were only in place from about April 15 to October 15 of each year from 1997 to 2002. The dry weather model was for all dry weather days, including the dry weather periods from January 1 to April 14 and October 16 to December 31.

Additionally, according to the June 2003 State of the Beach Report, "Bacteria appear to be entering Baby Beach from the storm drains even while the plugs are in place, indicating plug leakage. The most significant contributor of bacteria appeared to be the storm drains." Clearly the plugs were not eliminating the flow from the storm drains during 2001 and 2002, which was the period of time used to calibrate and validate the model.

Written Comment 21
(*County of Orange letter, Attachment A, Comment 17, dated April 3, 2008*)
Section 7.2.5 Calculation of Existing Dry Weather Bacteria Loads and TMDLs, Page 45, Second Paragraph: If modeling indicates that watershed bacteria levels were too low to result in the observed bacteria levels and Baby Beach storm drains were plugged during the model utilized data period (Comment #16), then it would seem uncertain that the required MS4 wasteload reductions would result in meeting the assimilative capacities or WQOs at Baby Beach. As noted in Comment #16, the dry weather model should be adjusted to reflect the site conditions at the time of the water quality monitoring data used and the required dry weather load reductions should be revised accordingly.

Response: The bacteria loads from the watershed runoff models were generally too low to result in the observed bacteria levels in the receiving water, *if those were the only bacteria loads in the receiving waters*. The bacteria loads from the watershed runoff models in addition to bacteria loads from other sources or already within the receiving water would cause an exceedance of REC-1 WQO. The text of the Technical Report has been revised to clarify this point.

Written Comment 22
(*County of Orange letter, Attachment A, Comment 18, dated April 3, 2008*)
Section 8.2 Load Allocations, Page 49, Third Paragraph: Better spatial information is available for the coverage of MS4s in the Baby Beach drainage area. Attachment B depicts the Baby Beach drainage area and MS4 subdrainages within it based upon a review of area grading and development plans. As noted in Comment #5, the watershed area used in the model should be revised to reflect the actual drainage area to Baby Beach. A redistribution of WLAs assigned to MS4s should be calculated to account for natural areas not included within coverage of an MS4.

Response: Please see the response to previous comment 9, which explains how including all the subwatersheds draining into Dana Point Harbor for the receiving water model is appropriate.

The modeling approach used actually provides the MS4s for Baby Beach a larger WLA than what would result from using the smaller watershed area as recommended by the commenter. As noted by the commenter in previous comment 9, the water quality data indicate that the bacteria impairment is limited to the area near Baby Beach. The storm drains near Baby Beach may be the most significant source of bacteria, as reported in the June 2003 State of the Beach Report. That does not preclude the possibility that bacteria from other parts of Dana Point Harbor may also have an impact. In any case, the WLA that is assigned to the MS4s ultimately requires that the REC-1 WQOs are met at Baby Beach.

The Regional Board encourages the phased approach that is currently being taken to correct the problem, by trying to identify and control the main sources of bacteria contributing to the impairment. Control of bacteria loads originating from the storm drains near Baby Beach may be all that is needed to reduce the bacteria levels to

acceptable levels. If control of the bacteria originating from the storm drains near Baby Beach is not enough, control of other sources and other storm drains that may contribute to bacteria loads impacting Baby Beach may be required.

Written Comment 23
(*County of Orange letter, Attachment A, Comment 19, dated April 3, 2008*)
Section 9.4 Persons Responsible for Controllable Nonpoint Source Discharges, Page 60, Second Paragraph: See comment #11 regarding encampments of homeless persons.

Response: Please see the response to previous comment 15.

Written Comment 24
(*County of Orange letter, Attachment A, Comment 20, dated April 3, 2008*)
Section 10.3.1 Point Source Discharges, Page 63, Table 10-1: San Diego Water Board Order No. R-9-2008-0001 has not been adopted. The citation should be revised to reflect the current NPDES permit No. R-9-2002-0001.

Response: References to Order No. R9-2008-0001 were corrected to be R9-2002-0001 as recommended.

Written Comment 25
(*County of Orange letter, Attachment A, Comment 21, dated April 3, 2008*)
Section 10.4.1 Compliance Schedule, Page 65, Second Paragraph: For over ten years the OC Public Works Department (formally RDMD) and the Orange County Health Care Agency have conducted numerous studies and implemented a variety BMPs in an effort to reduce bacteria levels at Baby Beach. These efforts have included seasonal plugs in storm drains, increased street sweeping efforts, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of Baby Beach harbor area water, a dry weather flow diversion structure on the west end of the beach, catch basin filter treatment systems, and the disposal of bird fecal droppings from the exposed intertidal areas of the beach. The document should be revised to describe implemented BMPs and to change text indicating that a dry weather flow diversion structure is at the west end storm drain not the east end.

Response: The water quality data indicate that the bacteria levels have improved significantly since 2002, when the municipalities began implementing effective measures. A noticeable change can be seen in the water quality data beginning in mid-2005 when the dry weather flow diversion structure was installed. This confirms the June 2003 State of the Beach Report finding that the storm drains are the most significant source of bacteria. The dry weather diversion structure is likely reducing the dry weather bacteria loads significantly. The significant reduction of dry weather bacteria loads by the diversion structure confirms that the 82-96 percent Baby Beach dry weather wasteload reductions calculated for the MS4 is appropriate.

The Implementation Plan in the Technical Report has been revised to acknowledge the efforts that have been taken at Baby Beach. The text has also been revised to correct the location of the diversion structure.

Written Comment 26
(*County of Orange letter, Attachment A, Comment 22, dated April 3, 2008*)
Section 10.6 Specific Implementation Objectives, Page 75, Third Paragraph. See comment #20.

Response: Please see the response to previous comment 24.

Written Comment 27
(*County of Orange letter, Attachment A, Comment 23, dated April 3, 2008*)
Appendix B, Comment 13, Page B-14: We believe that Professor Holden's comment that, "the miniscule amounts to be removed from the watershed will likely do little to protect public health" defines an underlying problem with the developed TMDLs. Considering that during dry weather the Baby Beach storm drains were plugged during the period of data used for modeling it is difficult to give any validity to the dry weather MS4 TMDLs or the actual assimilative capacity of Dana Point Harbor. The Regional Board's response to professor Holden's comment should be revised to reflect the MS4 conditions during the period of modeling.

Response: In Appendix B to the Technical Report, a response to Professor Holden's comment was provided, which adequately addressed Dr. Holden's concerns. Please see the response to previous comment 20, which discussed the potential impact on the modeling approach by the plugged storm drains.

Written Comment 28
(*County of Orange letter, Attachment A, Comment 24, dated April 3, 2008*)
Appendix B, Overarching Questions, Page B-14: Professor Holden makes a significant comment that, "the development of TMDLs and the implementation of them against a backdrop of great uncertainty regarding their effectiveness to protect human health represents an unwise expenditure of public funds." Although there may currently be limited data evaluating the human health risks associated with bacteria from waterfowl (continuing epidemiological studies this summer at Doheny Beach may shed light on this), there is considerable data regarding the source of bacteria at Baby Beach which can improve the developed TMDLs to more correctly reflect site conditions. As noted previously, the Baby Beach storm drains were plugged during the period of data used for modeling. Therefore, we believe that this creates great uncertainty as to developed TMDL and whether it will do anything to protect public health beyond current ongoing efforts.

Response: In Appendix B to the Technical Report, a response to Professor Holden's comment was provided, which adequately addressed Dr. Holden's concerns.

Please see the response to previous comment 12 regarding the general topic of uncertainty that is involved in using any modeling approach, and the response to previous comment 20 to regarding the plugged storm drains.

Written Comment 29

(*County of Orange letter, Attachment A, Comment 25, dated April 3, 2008*)
Appendix B, Overarching Questions, Page B-26, Comment: Professor Barber makes a significant comment that, "there are many data gaps that required assumptions that will eventually need to be proven in order to justify the expected costs associated with the implementation plan." A "lack of data" is used repeatedly throughout the document as a reason for model assumptions. As noted previously, additional monitoring and study data which could improve these TMDL models is and has been available at Baby Beach. Considering the unknown implementation costs of these TMDLs and the fact that current data has not been used to improve the modeling, her comment clearly points to the need to update the modeling.

Response: In Appendix B to the Technical Report, a response to Professor Barber's comment was provided, which adequately addressed Dr. Barber's concerns.

The Regional Board disagrees that the model needs updating to calculate the TMDLs. The TMDLs are based on REC-1 WQOs. The fact that the bacteria levels in Dana Point Harbor near Baby Beach consistently exceeded REC-1 WQOs prior to 2003 means that there were bacteria loads contributing to and causing the exceedances, and that those bacteria loads were likely originating from the storm drains. This is supported by the findings reported in the June 2003 State of the Beach Report.

The Baby Beach dry weather wasteload reductions calculated to meet the MS4 WLA are supported by the improvement in the water quality after the dry weather diversion structure was installed. The dry weather diversion structure is very likely reducing the dry weather bacteria loads from the MS4 significantly (i.e., possibly up to 100 percent). Therefore, the results of the dry weather model used to calculate the existing loads and TMDLs appear to have been correct in estimating that 82 to 96 percent reduction in the bacteria wasteload from the MS4 would reduce the bacteria levels enough to meet the REC-1 WQOs.

Written Comment 30

(*County of Orange letter, Attachment A, Comment 26, dated April 3, 2008*)
Appendix F, Section F.3.3.2.2, Lateral boundary conditions, Page F-40, Fourth Paragraph: The document states, "Contributions from subwatersheds 2101 and 2102 were included as lateral boundary conditions for DPH." This seems to contradict other information in the document (Table 2-1 and Figure J-3) that describe and depict the

Baby Beach watersheds as being 522.6 acres and subwatersheds 2101, 2102, 2103, and 2104. If only subwatersheds 2101 and 2102 were used for modeling loading, this would include approximately 195.7 acres. This is still over four times larger than the 43.4 acres shown on area grading and development plans as draining directly to Baby Beach (see Comment #5).

Response: Please see the response to previous comment 9, which explains how including all the subwatersheds draining into Dana Point Harbor for the receiving water model is appropriate.

The original text incorrectly states that only contributions from subwatersheds 2101 and 2102 were included as lateral boundary conditions. Subwatersheds 2101 through 2104 are correctly depicted in Figure F-20 as lateral boundary conditions. The text in Appendix F to the Technical Report has been corrected.

Written Comment 31
(*County of Orange letter, Attachment A, Comment 27, dated April 3, 2008*)
Appendix J, Figure J-3, Dana Point Harbor – Baby Beach Watersheds, Page J-3: The map area highlighted as being "impaired waterbody" extends beyond the east end of Baby Beach and around into the west basin of the harbor. This is an incorrect depiction of the impaired area of the harbor. The map should be revised to reflect impaired area being confined to Baby Beach.

Response: According to the 2002 303(d) List, the length of the impaired shoreline at Baby Beach is 0.4 miles. Figure J-3 depicts 0.4 miles of impaired shoreline. If the County of Orange is requesting a revision to the 2008 303(d) List, a request should be made during this next 303(d) listing cycle.

Written Comment 32
(*County of Orange letter, Attachment C, Comment 1, dated June 2, 2005*)
Section 4.1 Data Inventory, page 11: The text should list the specific reports utilized that corresponds to each data source. From the current text it is difficult to determine if the extensive data collected in the June 2003 State of the Beach Report was included in the model. This project was funded through the Clean Beaches Initiative and includes a thorough data mining report, circulation study and special bacteriological studies conducted during the summer and fall of 2002. Without utilizing this data, it is doubtful that the model accurately approximates the bacterial influences at Baby Beach.

Response: The data sources were included in the Technical Report. Appendix D to the Technical Report, listing all the data sources and time periods, was prepared in response to this comment.

Written Comment 33
(*County of Orange letter, Attachment C, Comment 2, dated June 2, 2005*)
Section 5.1 Nonpoint Sources, Page 18: The text does not identify sediments as a potential nonpoint source of bacteria. The June 2003 State of the Beach Report and continued studies by the County of Orange Health Care Agency have identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach.

Response: Please see the response to previous comment 16.

Written Comment 34
(*County of Orange letter, Attachment C, Comment 3, dated June 2, 2005*)
Section 5.2.2.b Dry Weather Urban Runoff: The analysis of dry weather urban runoff does not take into account the fact that all storm drains leading to Baby Beach are plugged from May through September since 200X [sic], eliminating the influence of urban runoff during this season. Without incorporating this information, it is doubtful that the model accurately approximates the bacterial influences at Baby Beach.

Response: Please see the response to previous comment 20.

Written Comment 35
(*County of Orange letter, Attachment C, Comment 4, dated June 2, 2005*)
Section 6.1.1.d Constituents, Page 23: The text should define the term “state variable.”

Response: The text of the February 22, 2008 Technical Report includes the definition of “state variable.”

Written Comment 36
(*County of Orange letter, Attachment C, Comment 5, dated June 2, 2005*)
Section 6.2 Wet-weather Modeling Analysis, Page 24: The model does not address re-growth of bacteria within the system. The June 2003 State of the Beach Report and continued studies by the County of Orange Health Care Agency have identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach

Response: Bacteria re-growth is a complex process that must account for site-specific features of a watershed for estimation (e.g., temperature, organic material). Information for quantification of re-growth is not available. As a result, assumptions were required to provide consideration of potential re-growth in the models.

For the receiving water model, bacteria die-off and re-growth rates were not considered. There were no site-specific data available, and given that natural and background sources are a considerable portion of the potential bacteria loads in the receiving water, no net die-off rate was assumed. However, as discussed in the response to previous comment 16, if the impairment at Baby Beach is caused by re-

growth and resuspension of bacteria near the shoreline, this would not be considered a natural source if the bacteria and sediments originated from the storm drain.

Written Comment 37
(*County of Orange letter, Attachment C, Comment 6, dated June 2, 2005*)
Section 7.2.1 Identification of the Critical Dry-weather Condition, Page 31: The text should clarify whether the tidal regime chosen for both the wet-weather and dry-weather has actually occurred during those periods. It is unclear whether the chosen critical tidal regime would occur during both wet and dry season. The text should also include the rationale for what factors characterize a critical tidal condition.

Response: The critical tidal period is used only in the receiving water model and as a "worst case" assimilative capacity scenario. This "worst case" scenario could occur under wet weather or dry weather conditions. The same 30-day critical tidal period was used for both the wet weather and dry weather models and discussed in more detail the February 22, 2008 Technical Report. The critical tidal period is the period of time when the receiving water is expected to have the lowest assimilative capacity. The 30-day critical tidal period selected for calculating the TMDL and existing loads in the receiving water was from March 7 to April 7, 2001. The bacteria loads from the watershed models were used as an input into the receiving water model. The watershed model simulation dates did not necessarily correspond to the receiving water model simulation dates.

Written Comment 38
(*County of Orange letter, Attachment C, Comment 7, dated June 2, 2005*)
Appendix G, Introduction, Page 1, Second Paragraph: This discussion of near shore contributions of bacteria should include a discussion of bather shedding of bacteria. Nearshore contributions in some cases where there is high-density human use can be due to shedding from humans (especially infants and children). The name of the impaired waterbody in Dana Point Harbor (Baby Beach) suggests there is a high degree of use by children.

Response: The Technical Report has been revised to include bather shedding as a potential background source of bacteria in section 5 of the Technical Report (Source Analysis).

Written Comment 39
(*County of Orange letter, Attachment C, Comment 8, dated June 2, 2005*)
Appendix G, Introduction, Page 1, Third Paragraph: The modeling approach described does not capture the transformations bacteria undergo, i.e., dieoff due to exposure to ultraviolet radiation and saline conditions, and regrowth where conditions are favorable. These dynamics make a simple buildup and washoff model prone to higher degrees of

error and uncertainty. Some recent data suggest that regrowth of bacteria can happen fairly quickly.

Response: Please see the response to previous comment 12 in regard to the general topic of uncertainty associated with models, and the response to previous comment 36 in regards to bacteria die-off and re-growth rates.

Written Comment 40
(*County of Orange letter, Attachment C, Comment 9, dated June 2, 2005*)
Appendix G, Introduction, Page 1, Fifth Paragraph: Substantive concerns were raised about the degree to which these models were calibrated. For example, see comments 19-32 and 35-38 in the County's April 16, 2004 comment letter on TMDL Project 1.

Response: For TMDL and bacteria load calculation purposes, the models were adequately calibrated and validated. For example, the dry weather model predicted that reducing the bacteria loading from the MS4 to Baby Beach by 82 to 96 percent would restore the water quality. The Baby Beach municipalities installed the dry weather diversion structure on the west end of the beach in 2005, which is likely reducing the bacteria loads from the MS4 storm drains to Baby Beach by 80 percent or more during dry weather. The dry weather water quality data collected since the dry weather diversion structure was installed show significant improvement and appear to be meeting water quality objectives consistently. The degree to which these models were calibrated and validated were adequate for calculating TMDLs and identifying sources of bacteria that need control.

The April 16, 2004 comment letter referenced to by the commenter were submitted for a preliminary draft of the Technical Report for Bacteria TMDL Project I that was being prepared for scientific peer review. These comments were addressed when Bacteria TMDL Project I was adopted by the Regional Board in December 2007. Because these comments are not provided in the record, comments 19-32 and 35-38 from the April 16, 2004 comment letter on Bacteria TMDL Project I and responses within the context of this TMDL project are provided below:

Comment 19 - The statement about the dependence of bacteria concentrations on land use is essentially lacking in content, and therefore not useful in evaluating the modeling approach and results. The description of the watershed model in the Appendix refers to a SCCWRP study and a Regional Board publication, but presents no actual data on bacteria loads from different land uses. Because these data are so key to the model results, this paragraph, or the Appendix, should present the estimates of loads from specific land uses and discuss their implications. For example, there should be a logical relationship between the relative magnitude of loads from urbanized and open space land uses, the proportion of each watershed in open space, and the size of the background allowance for each watershed. In general, there is a lack of such internal consistency checks in the validation of the modeling assumptions.

Response to Comment 19 – Please see the response to comment 40 above and comment 41 below.

Comment 20 - The selection of the baseline year for modeling wet year loads is a critical one, yet there is no readily apparent explanation or justification for this choice. It would be useful to see model runs that show the sensitivity of the TMDL targets to different rainfall years. As it stands, the choice of this particular year seems arbitrary.

Response to Comment 20 – Additional discussion about the critical wet year is included in section 7.1.1 of the Technical Report. Also, please see the response to comment 40 above.

Comment 21 - It is inappropriate to state that something is "generally understood" in a document of this significance. This section attempts to causally link the observation of high bacteria levels at the shoreline to urban runoff by stating that dry weather flows are "generally understood" to result from urban runoff. This is not a valid statement. The document appears to argue, by inference, that all flow in the absence of rainfall must necessarily stem from urban runoff. Historical records of many streams in southern California indicate this assumption is not as broadly true as this paragraph makes it seem. In general, there are too many technically unsupported statements like this in the document. While it may be challenging, the TMDL targets should include an estimate and an allowance for dry weather base flow where appropriate. The USGS records could provide a starting point for this exercise.

Response to Comment 21 – Additional discussion about dry weather urban runoff is included in section 5.2.3.2 in the Technical Report. Also, please see the response to comment 40 above.

Comment 22 - This section, which describes the rationale for choosing between the steady-state and dynamic modeling approaches, is internally inconsistent. Steady-state models are described as best suited to streams dominated by point source inputs with impairment only under low-flow conditions. Dynamic models, in contrast, are more suited to streams affected by nonpoint sources or rainfall-driven flow and pollutant contributions. Preceding sections make it clear that the bacteria problem in watersheds in the San Diego Region occurs in both dry and wet weather and the document argues that bacteria loading is driven by the rainfall-mediated washoff of bacteria accumulated on land surfaces, a notably variable process. This would suggest that a steady-state model is not appropriate. However, on the basis of an unsupported assumption that the Region is "dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains," a steady-state modeling approach is chosen. There is no documentation given for this assumption about the behavior of nonpoint sources, nor is there any reference to more detail in an Appendix. In fact, available data show strong variability in flow and bacteria levels over the course of a day. The conclusion that the nonpoint sources can be treated as point sources is thus simply an assertion, and it seems that this decision may have been motivated instead by the availability of data. Given the rather significant management implications of the TMDL targets, which are based on

modeling results, this level of justification for a major technical decision is inadequate. The evidence for the "generally constant" behavior of nonpoint sources should be presented and the sensitivity of the modeling results to different technical approaches should be investigated.

Response to Comment 22 – The discussion about the applicability of a steady-state versus dynamic watershed modeling approach was completely revised, and is included in section 6.1.1.1 of the Technical Report.

Comment 23 - The assertion that "available data indicate that the main sources are dry- and wet-weather urban runoff" is not fully supported by the data and analyses presented. The data do show an association between impairment along the coast and proximity to the mouths of rivers and creeks. In addition, the data show that the frequency of exceedances is higher for creeks and streams whose watersheds contain urbanized land uses than the level seen at the reference watershed in Los Angeles County. However, that does not necessarily equate to a conclusion that the main sources of bacteria are urban runoff, particularly given the flawed "analysis" of the monitoring data off the mouth of San Mateo Creek during the dry season (see comment 11b). For example, no explanation is provided for how urban land uses, which make up only 8% of the area of impaired watersheds (Section 3.1), could be the major source of impairment. This would require that urban land uses produce significantly more bacteria load per unit area than does open space or agriculture, a simple consistency check that is not performed. Nor is there any evaluation of whether and to what extent the Los Angeles reference watershed is applicable to the San Diego Region. It may well be, but this document assumes that this should simply be taken on faith.

Response to Comment 23 – Please see the response to comment 40 above.

Comment 24 - Again, this section tangles a discussion of what is logically the most likely case with what is logistically feasible, and then selects the logistically most feasible choice and pretends it is also the most logically likely (see, for example, comment 21 the choice of a steady state modeling approach). Thus, following a warning (in the 1st paragraph) about the danger of omitting key state variables, the 2nd paragraph goes on to conclude that first-order die-off is the most important variable. This conclusion is based, not on any objective evidence, but simply on the lack of data on the relative importance of other factors. A more objective and thorough modeling approach would have included sensitivity analyses to estimate how large any of these other factors would have to be to substantially change the modeling results. Then, these estimates could be evaluated to determine if any are within the realm of possibility. This might be especially important for regrowth, which some data suggest might be important in determining ambient levels.

Response to Comment 24 – Please see the responses to comments 12 and 40 above.

Comment 25 - The definition of "critical point" is still unclear, even this far into the document. Neither this statement, nor previous ones, clarify how much mixing, if any, has occurred by the time the discharge from the creek, etc. has

reached the critical point. The language used, "the point where the creek/watershed or storm drain initially mixes with ocean water at the surf zone," could be interpreted to mean any one of the following:

a) where initial mixing begins but where the discharge water still maintains its original signature
b) where initial mixing is underway and where the discharge water has started to lose its original signature
c) where initial mixing has been completed and the discharge has lost its original signature.

Each of these definitions has a somewhat different implication for the level of reduction needed to meet the TMDL target, since the greater the degree of mixing the lesser the reduction needed to meet the target. The failure to adequately define, in physical process terms, the nature of the critical point, is significant. It may well be dealt with in the depths of the model algorithms, but this is not accessible to the reader of this document. In addition, despite the lengthy reference in this section to the Appendix, there is no mention of "critical point" in Appendix D, which deals with water quality modeling.

Nor is there any explanation or justification provided, from the policy perspective, for why this particular location was selected as the critical point. The entry point of a discharge, particularly a large one like a creek, into the ocean is not typically a place where recreational body contact use is concentrated. Due to the importance of the location of the critical point for the TMDL, it deserves more explanation.

Response to Comment 25 – This project does not use a watershed model and critical point to calculate the TMDL. The receiving water model is used to calculate the TMDL at the critical location, which is the length of the shoreline. Therefore, this comment is not applicable to this TMDL project.

Comment 26 - The introductory paragraph to this section reflects an incompletely developed conceptual model of background or natural sources of bacteria. The conceptual model implicit here and in other places in the document is that bacteria from natural sources enter receiving waters either directly (e.g., waterfowl) or as the result of runoff directly into receiving waters from open space. The possibility that bacteria from natural sources could enter MS4s is apparently not considered and/or accounted for. The only way the statements in the document can be understood to be logically consistent is as follows:

- Natural sources are uncontrollable.
- Sources from urban runoff associated with MS4s are controllable. Therefore, natural sources do not contribute to urban runoff in MS4s.

However, this does not account for observations that:

- Wildlife (e.g., rabbits, skunks, coyotes, birds) frequent developed areas and bacteria from their droppings enters the MS4 via runoff after rain

- MS4s in many locations drain combinations of urbanized and open space, for example, where development abuts open space and runoff from the open space flows onto streets and then into the MS4
- Portions of the MS4 (e.g., stormdrains and channels) are used as habitat by some species of wildlife.

Assuming that these sources are controllable simply because they end up in the MS4 is simplistic and is unrealistic.

Response to Comment 26 – This comment was addressed with the Reference System and Antidegradation Approach (RSAA) and Natural Sources Exclusion Approach (NSEA) Basin Plan amendment. Municipal Dischargers are responsible for the anthropogenic sources of bacteria that enter their MS4s. However, if natural and background sources appear to be the sole source of continued impairment, the NSEA may be applied. The Implementation Plan in the Technical Report has been revised to provide more information about the NSEA and when it may be applicable

Comment 27 - The justification for the selection of the critical wet-weather condition is not logical. Flows in creeks and rivers in southern California during "extreme wet conditions" are high and rapid, the ocean environment off creek and river mouths is turbulent and dangerous, and REC1 use at these places and times is highly unlikely. In fact, anyone engaging in body contact recreation under these conditions might well run a much higher risk of drowning than of illness from exposure to contaminated water. Standard risk management approaches typically focus on circumstances in which risk is highest, generally assessed as a combined function of the level of hazard and the number of people exposed. While the level of the hazard in the wet-weather critical period is high, the number of people exposed is most probably extremely limited. Therefore, the justification for using this period to set the TMDL targets, with their attendant consequences for management policies and implementation costs, is weak.

Response to Comment 27 – This comment applies to creeks and rivers and is not applicable at the shoreline segments included in this TMDL project.

Comment 28 - Again, there is need for explicit reference to, or inclusion of, loading estimates from each land use type.

Response to Comment 28 – Please see response to comment 41 below.

Comment 29 - The logical process linking all the pieces described to this point is not clear. Data have been presented on bacteria levels, loads, and frequencies of exceedances, without a clear description of how they are being integrated to create the targets. A flow chart would be helpful. In addition, it would be desirable to have more than one reference watershed, given that there will necessarily be natural variability in reference conditions.

Response to Comment 29 – This TMDL project is not incorporating the use of a reference system. Therefore, this comment is not applicable to this TMDL project.

Comment 30 - This table presents a TMDL target for total coliforms that is less than that for fecal coliforms. This does not seem possible. This example highlights the need for explicit consistency checks between various aspects of the data, the process assumptions, and the modeling results.

Response to Comment 30 – This comment refers to a numeric target for total coliform indicator bacteria based on the SHELL beneficial use water quality objective. The SHELL beneficial use is not addressed in this project, thus this comment is not applicable to this TMDL project.

Comment 31 - As mentioned above, it is logically inconsistent to describe natural background sources as uncontrollable and then make no provision for them in the final TMDL targets. Thus, while the text discusses the need to find a reference watershed for the San Diego Region, the targets themselves contradict this by setting the allowable exceedance frequency at zero. The TMDL targets, once adopted, become enforceable regulatory numbers. It would be more logically consistent to defer the TMDL until the reference data are available.

Response to Comment 31 – This comment was addressed with the RSAA/NSEA Basin Plan amendment. If natural and background sources appear to be the sole source of continued impairment, the NSEA may be applied. The Implementation Plan in the Technical Report has been revised to provide more information about the NSEA and when it may be applicable.

Comment 32 -Given the importance of the critical point definition, it should appear much earlier in the document. Alternatively, this section could be referenced at the first mention of critical point.

Response to Comment 32 – This project does not use a watershed model and critical point to calculate the TMDL. The receiving water model is used to calculate the TMDL at the critical location, which is the length of the shoreline. Therefore, this comment is not applicable to this TMDL project.

Comment 35 -As discussed above, there is no justification provided, other than ease of model calculation, for use of a steady-state model for dry weather flows and bacteria loading. Available data certainly do not present a steady-state picture and there is no sensitivity analysis of the impact this assumption has on the modeling results

Response to Comment 35 – The discussion about the applicability of a steady-state versus dynamic watershed modeling approach was completely revised, and is included in section 6.1.1.1 of the Technical Report. Also, please see the response to comment 40 above.

Comment 36 - There is no justification provided for use of the watershed mouth as the critical point for dry weather. The implicit assumption apparent from the language used is that bacteria levels are assumed to be highest at the critical point. However, this is not consistent with available monitoring data. For dry weather, the extensive Aliso Creek monitoring data showed that densities were consistently higher in the upper reaches of the watershed, where the ratio of discharge input to

ambient flow is highest and where dieoff has not yet had much opportunity to affect bacteria populations. Given the Aliso Creek data, it is not logical to assume that compliance with WQOs must be "maintained for all segments of a waterbody to ensure that impairments of beneficial uses are not observed."

Response to Comment 36 – This project does not use a watershed model and critical point to calculate the TMDL. The receiving water model is used to calculate the TMDL at the critical location, which is the length of the shoreline. Therefore, this comment is not applicable to this TMDL project.

Comment 37 - The text states, "The only point sources identified to affect impaired water bodies addressed in this study were MS4s.", yet includes no discussion of the evaluation of other point sources, such as Waste Discharge Requirement permits or NPDES Construction Permits. It is not clear whether any other point sources were evaluated during the development of this TMDL.

Response to Comment 37 – Other point sources, including boats and wastewater treatment plants, were identified and discussed in this TMDL project. The discussion about point sources is included in section 5 of the Technical Report (Source Analysis).

Comment 38 - Agricultural runoff is not discussed as a possible source requiring a load allocation assignment. It does not appear that agricultural runoff has been investigated as a source of bacterial contamination in any watershed addressed in this document. Additionally, it is inappropriate to defer the investigation, quantification and designation of Load Allocations until after the TMDL is developed.

Response to Comment 38 – There were no agricultural land use areas identified in the watersheds that drain to the shoreline segments in this TMDL project. Therefore, this comment is not applicable to this TMDL project.

Written Comment 41

(*County of Orange letter, Attachment C, Comment 10, dated June 2, 2005*)
Appendix G, G.1.1 Watershed Segmentation, Second Paragraph: In order to evaluate whether the hydraulic assumptions in the model are accurate, it's important to know whether the streams and channels that input to the impaired areas really behave like pipes. If there are places where there are eddies, backflows, pooling, or other features that do not reflect direct flow, then the hydraulic assumptions of the model will not be representative.

Response: The assumptions used in the models were adequate for calculating TMDLs and identifying sources of bacteria that need to be controlled. Assumptions were made because there were no data available to provide more accurate site specific conditions. Please see the response to previous comment 40.

Written Comment 42
(*County of Orange letter, Attachment C, Comment 11, dated June 2, 2005*)
Appendix G, G.1.2.d Pollutant Representation: See comment #3 above, in particular comments 19-24, 26, 28, and 35 in the April 16 comment letter. The buildup and washoff approach to bacteria loading should be explained more fully to make clear whether the buildup algorithm allows for dieoff of bacteria as they sit on the land surface exposed to sunlight. In addition, the document should clarify whether the buildup algorithm treats all surfaces as impervious, or whether it allow for flushing of coliforms that are naturally resident in soils, a different physical process from washoff of an impervious surface.

Response: Appendix F of the February 22, 2008 draft Technical Report includes information and discussion about impervious and pervious surfaces and references the different algorithms used for each type of surface.

Written Comment 43
(*County of Orange letter, Attachment C, Comment 12, dated June 2, 2005*)
Appendix G, G.1.2.e Waterbody Representation: The document states, "Each delineated subwatershed was represented with a single stream assumed to be completely mixed, on-dimensional segment with a trapezoidal cross-section." That may be a reasonable assumption if all the inputs to the listed areas are in fact concrete lined channels. However, if they are natural streams, or channels with earthen sides or bottoms, there could be major problems with this assumption. In addition, many channels have accumulated sediment and vegetation, and some have dikes to promote infiltration for ground water recharge. Any of these factors could undermine the validity of the modeling results. While models do have to make simplifying assumptions, it's important not to take these to the point where the model is no longer a reasonable representation of the system. It would be useful to validate this assumption by comparing the actual measured flows to modeled flows in a channel that clearly does not meet the assumption that the channel is essentially a well-mixed pipe.

Response: The assumptions used in the models were adequate for calculating TMDLs and identifying sources of bacteria that need to be controlled. Assumptions were made because there were no data available to provide more accurate site specific conditions. Please see the response to previous comment 40.

Written Comment 44
(*County of Orange letter, Attachment C, Comment 13, dated June 2, 2005*)
Appendix G, G.1.2.e Waterbody Representation: The document does not state the criteria for determining representativeness. The document should describe how well the approximated GIS-based reach reflects the actual range of stream and channel characteristics found in the DPH and SDB sub-watersheds. Without this information, a determination whether the reaches were selected because they are representative of actual stream characteristics or because they meet the modeling assumptions cannot be made.

Response: The assumptions used in the models were adequate for calculating TMDLs and identifying sources of bacteria that need to be controlled. Assumptions were made because there were no data available to provide more accurate site specific conditions. The County of Orange was given opportunities to provide more site specific data in December 2004 and June 2005, but did not do so. Please see the response to previous comment 40.

Written Comment 45
(*County of Orange letter, Attachment C, Comment 14, dated June 2, 2005*)
Appendix G, G.1.3.a Hydrology Calibration and Validation: See comment #3 above, in particular comments 19-22 in the April 16 comment letter.

Response: Please see the responses to previous comments 20, 34, and 40.

Written Comment 46
(*County of Orange letter, Attachment C, Comment 15, dated June 2, 2005*)
Appendix G, G.1.3.b Water Quality Calibration and Validation: See comment #3 above, in particular comments 19-24, 26, 28-29, and 31-32 in the April 16 comment letter.

Response: Please see the responses to previous comments 20, 34, and 40.

Written Comment 47
(*County of Orange letter, Attachment C, Comment 16, dated June 2, 2005*)
Appendix G, G.1.3.b Water Quality Calibration and Validation: The document states, "no data are available for the bay and harbor watersheds to further validate the parameters as part of this current modeling effort." This is a serious data gap. These watersheds may well behave differently than the other coastal watersheds that were the focus of TMDL Project 1. As just one example, the mixing dynamics at the mouth of the watershed will be different. Tidal influences and mixing in a bay are going to be very different, as well conditions that determine the dieoff and/or regrowth rates. Human use patterns will also be different, and, to the extent that direct shedding by humans is a significant sources, this could be an important difference. Without watershed specific data to calibrate the parameters of the model, the results of the model are at best questionable and should not be used as the basis of major policy decisions or implementation plans.

Response: The parameters referred to by the commenter are the land use specific accumulation and maximum build up rates for fecal coliform, total coliform, and *Enterococcus* indicator bacteria, which were taken from the Los Angeles Region. San Diego Region specific accumulation and maximum build up rates for fecal coliforms, total coliforms, and *Enterococcus* indicator bacteria are not available. The alternative would be to take values from literature or some other source that would likely be even less representative of accumulation and maximum build up rates for

the San Diego Region. Until San Diego Region specific values are developed, or watershed specific values are provided, the Los Angeles Region values are the most appropriate. Also, please see the response to previous comment 40.

Written Comment 48
(*County of Orange letter, Attachment C, Comment 17, dated June 2, 2005*)
Appendix G, G.2 Dry Weather Watershed Model: See comment #3 above, in particular comments 19, 21-26, 28-32, and 35-38 in the April 16 comment letter.

Response: Please see the responses to previous comments 20, 34, and 40.

Written Comment 49
(*County of Orange letter, Attachment C, Comment 18, dated June 2, 2005*)
Appendix G, G.2 Dry Weather Watershed Model: The document states, "this predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and pollutant load." This representation may not be adequate for dry weather flow. Patterns of bacteria concentrations are not well represented by steady-state mass balance assumptions, as previous work on Aliso Creek has demonstrated.

Response: Please see the responses to previous comments 40, 41, 43, and 44.

Written Comment 50
(*County of Orange letter, Attachment C, Comment 19, dated June 2, 2005*)
Appendix G, G.2.1 Model Configuration: The document should state on what basis are bacteria presumed to be conservative, and how dieoff and regrowth processes are or are not accounted for in the model.

Response: Please see the response to previous comment 36.

Written Comment 51
(*County of Orange letter, Attachment C, Comment 20, dated June 2, 2005*)
Appendix G, G.2.1 b Conceptual Representation: The document should state the loss rate used in the model and the basis for the chosen rate.

Response: The document states the die-off rate used in the model and the basis for the chosen rate in section F.2.4.2 of Appendix F to the Technical Report. The loss rate is the same as the die-off rate.

Written Comment 52
(*County of Orange letter, Attachment C, Comment 21, dated June 2, 2005*)
Appendix G, G.2.1 b Conceptual Representation: The described approach is suitable for dealing with a large number of streams and coming up with a representative, or average, predictions. However, in Dana Point Harbor, there are only a few inputs to the

system and, future BMPs to meet the TMDLs are going to be very site-specific in nature. Further, the degree to which TMDL targets are being met will be assessed on the basis of bacteria concentration monitored at specific locations. This situation will result in site-specific monitoring being compared to TMDL targets generated on the basis of regional characterizations of highly simplified channel morphologies. The TMDL targets should be generated using site-specific information.

Response: Please see the response to previous comment 12.

Written Comment 53
(*County of Orange letter, Attachment C, Comment 22, dated June 2, 2005*)
Appendix G, G.2.2 Estimation of Dry-Weather Runoff: See comment #3 above, in particular comments 19, 21-26, 28-32, and 35-38 in the April 16 comment letter.

Response: Please see the responses to comments 20, 34, and 40.

Written Comment 54
(*County of Orange letter, Attachment C, Comment 23, dated June 2, 2005*)
Appendix G, G.2.2 Estimation of Dry-Weather Runoff: The document identifies 13 land use types and states the statistical relationship established between each land use area and flow showed good correlation. However, there were good correlations between land use type and flow for only three of the identified land uses. The document needs to provide justification for the broad claim that land use area and flow show good correlation.

Response: The document provides the justification in section F.2.2 of Appendix F to the Technical Report. The discussion about the correlation of land use and dry weather flow has been revised and provides more detail in the February 22, 2008 draft Technical Report compared to the April 19, 2005 preliminary draft Technical Report.

Written Comment 55
(*County of Orange letter, Attachment C, Comment 24, dated June 2, 2005*)
Appendix G, G.2.3 Estimation of Bacteria Densities: See comment #3 above, in particular comments 19-24, 35, and 37-38 in the April 16 comment letter.

Response: Please see the responses to comments 20, 34, and 40.

EXHIBIT 1

From: Julie Chan [mailto:JChan@waterboards.ca.gov]
Sent: Monday, December 13, 2004 9:32 AM
To: marilyn.schwartz@amec.com; kweldon@ci.encinitas.ca.us; npalmer@ci.laguna-niguel.ca.us; mlahsaie@ci.oceanside.ca.us; chi.vargas@dot.ca.gov; emkimura@earthlink.net; Rgersberg@mail.sdsu.edu; hbailey@padre.org; khelyer@portofsandiego.org; amanda.carr@rdmd.ocgov.com; alangworthy@sandiego.gov; PVainik@sandiego.gov; RKolb@sandiego.gov; smichel@scwrp.org; gabe@sdbaykeeper.org; Sheri.McPherson@sdcounty.ca.gov; vjmellano@ucdavis.edu; Christina Arias; Sabine Knedlik
Cc: howard.bailey@amec.com; GPennell@ci.oceanside.ca.us; justice@lagunabeachcity.net; linette.lina@pfrd.ocgov.com; jnystrom@portofsandiego.org; rwatson@rwaplanning.com; asonksen@sandiego.gov; bruce@sdbaykeeper.org; joann.weber@sdcounty.ca.gov; steve.carter@tetratech-ffx.com
Subject: Data sets, Data gaps memo from Tetra Tech

Bacteria II SAG,

Attached are memos from Steve Carter of Tetra Tech listing data sets and identifying data gaps for the Lagoons project and Bays project. Please read these memos, and if you have or know of any additional data, please provide it to Steve.

Thanks,
Julie Chan

EXHIBIT 1

TETRA TECH, INC.
1230 Columbia St., Suite 520
San Diego, CA 92101
Telephone (619) 525-7015
FAX (619) 232-2392

MEMORANDUM

DATE: December 10, 2004

TO: Stakeholder Advisory Group of the San Diego Bay and Dana Point Harbor Shoreline Bacteria TMDLs

FROM: Stephen Carter, Tetra Tech

CC: Peter Kozelka, EPA Region 9
John Craig, Tetra Tech
Julie Chan, RWQCB – San Diego Region
Sabine Knedlik, RWQCB – San Diego Region

SUBJECT: Data inventory and data gaps

The present study includes development of technical approaches for calculation of bacteria TMDLs for the following bay/harbor shorelines:

- Dana Point Harbor at Baby Beach
- San Diego Bay shoreline at Shelter Island
- San Diego Bay shoreline at G Street
- San Diego Bay shoreline at B Street Pier
- San Diego Bay shoreline at Chula Vista Marina
- San Diego Bay shoreline at Tidelands Park

To support this effort, models will be developed for the watersheds and shoreline receiving waters to assess bacteria sources and the assimilative capacity of the shoreline areas. A general overview of the technical approach was presented to the Stakeholder Advisory Group (SAG) at a meeting held on November 22, 2004.

Key datasets are necessary to properly parameterize, configure, and calibrate the models. Many of the datasets required for development of watershed models were compiled for development of the *Bacteria-Impaired Waters TMDL Project I for Beaches and Creeks in the San Diego Region - TECHNICAL DRAFT* (Bacti I). These watershed models will be configured for the drainage areas of the impaired shorelines. If additional water quality of flow data are identified within these watershed, these data can be used to refine and further test the watershed models. Much data have been compiled for San Diego Bay and Dana Point Harbor, however additional datasets will help improve the quality of the

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models. The purpose of this memo is to provide the SAG an inventory of data compiled thus far, and invite comment or submission of additional datasets not identified by Tetra Tech or RWQCB staff.

Data types can be separated into the following five categories:

1. Spatial Data – GIS or locational information (e.g., monitoring station coordinates)
2. Hydrologic/Hydraulic Data – Lagoon bathymetry, lagoon hydraulic information (studies of tidal flushing, hydraulic designs, etc.), and tributary flow data
3. Meteorological Data – Relevant historic meteorological records at monitoring stations within the vicinity of the lagoons
4. Water Quality Data – Biological and chemical measurement data collected from beaches adjacent to impaired lagoons
5. Special Studies (e.g., waterfowl census, bacteria die-off studies)

Datasets have been identified within each of these categories and are listed in Tables 1 through 6. Datasets that have not been received by Tetra Tech are labeled *Not Received* in the *Status* columns. Datasets that lack important information, such as location of monitoring sites, are reported in the *Comments* columns. For some categories, no data have been identified for a given waterbody and are labeled *None Identified* in the *Status* columns. For example, no salinity, temperature, or conductivity data have been identified for Dana Point Harbor (see Table 5). All datasets listed as *Not Received* and *None Identified,* or are specified to lack key information in the *Comments* columns, are considered data gaps for this study.

A review of the data inventory by the SAG is essential to ensuring that the technical approach for TMDL development is based on all available data. The SAG is encouraged to review data gaps identified in Tables 1 through 6, and provide any relevant information that can supplement the current inventory. In the absence of key information, these gaps may be addressed through technical assumptions based on literature or regional data analyses. To ensure that all data and information available are included in the analyses, it is important that the data be submitted as soon as possible.

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Table 1. Spatial Data

Data Type	Source of Data	Status	Comments
Storm Drain Network	City of Chula Vista	Received	Data obtained through Port of San Diego
	City of Coronado	Received	
	City of San Diego – available through SANGIS	Not Received	
Stream network	USGS -National Hydrography Dataset (NHD)	Received	
Land Use	USGS - Multi-Resolution Land Characteristics (MRLC)	Received	
	San Diego Association of Governments (SANDAG)	Received	
	Southern California Association of Governments (SCAG)	Received	
Soils	USDA-NRCS (STATSGO)	Received	
Topographic and Digital Elevation Models (DEMs)	USEPA BASINS, USGS	Received	
303(d) GIS	RWQCB	Received	GIS missing for B Street and Broadway piers
Digital Ortho Quarter Quads (DOQQ)	University of California, Davis	Received	

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Table 2. Physical/Hydrodynamic Data

Waterbody	Data	Data Source	Years Collected	Status	Comments
San Diego Bay	Bathymetry	SCRIPPS	2002	Not Received	
		UCSD		Not Received	
		USACE	1999	Not Received	
		NAVY (SPAWAR)		Received	
	Water Surface Elevations	NOAA CO-OPS Station 9410170	1906-Present	Received	
		NAVY (SPAWAR)		Not Received	
		SCRIPPS	1993	Not Received	Data collected at 7 locations inside and immediately outside the bay
	Currents	SCRIPPS	Variable	Not Received	Stations: Imperial Beach Pier, Coronado Island
		SCRIPPS/NDBC /NOAA	1996	Not Received	Station: Point Loma
	Tidal Velocities	SCRIPPS	1993	Not Received	7 Locations inside and immediately outside of the bay
	Bay Outflows	SCRIPPS	1993–1994	Not Received	Mouth of the bay
Dana Point Harbor	Bathymetry	USACE	1999	Received	
	Water Surface Elevations			None Identified	
	Currents			None Identified	
	Tidal Velocities			None Identified	
	Bay Outflows			None Identified	

Table 3. Meteorological Data

Waterbody	Data	Data Source	Station(s)/Spatial Coverage	Years Collected	Status
San Diego Bay	Wind speed, Wind direction, Air temperature, Relative humidity, Barometric Pressure, Solar radiation and Rainfall	SCRIPPS	Imperial Beach Pier, Coronado Islands	Variable depending on parameter	Not Received
	Air temperature, Sea surface temperature, Wind speed, Wind direction	SCRIPPS/NDBC/ NOAA	Point Loma	Variable depending on parameter	Not Received
	Precipitation	NCDC/NOAA	San Diego North Island Nas	1922 – present	Received

EXHIBIT 1

Waterbody	Data	Data Source	Station(s)/Spatial Coverage	Years Collected	Status
			San Diego Lindbergh Field	1929 – Present	Received
			San Diego Miramar Nas	1946 – Present	Received
			San Diego Sea World	1998 – Present	Received
Dana Point Harbor.	Air temperature, Sea surface temperature, Wind speed, Wind direction	SCRIPPS/NDBC/ NOAA	Dana Point	Variable depending on parameter	Received
	Precipitation	NCDC/NOAA	Laguna Beach No2	1948 - Present	Received

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Table 4. Bay Bacteria Data

WATERBODY	Segment / Area	Data Source	Years Collected	Site(s) Identified	Location Description	Water Quality Parameter	Status
San Diego Bay	at Shelter Island Shoreline Park	San Diego County Department of Environmental Health	1997-2003	EH-200	Shelter Island	TC, FC, ENT	Received
	at vicinity of B Street and Broadway Piers						None Identified
	at G Street Pier						None Identified
	at Chula Vista Marina						None Identified
	at Tidelands Park	San Diego County Department of Environmental Health	1997-2003	EH-070	Tidelands Park (bayside)	TC, FC, ENT	Received
Dana Point Harbor	at Baby Beach	Orange County-Health Care Agency	1996-2002	BDP12	Baby Beach - West End	TC, FC, ENT	Received
				BDP13	Baby Beach - Buoy Line	TC, FC, ENT	Received
				BDP14	Baby Beach - Swim Area	TC, FC, ENT	Received
				BDP15	Baby Beach - East End	TC, FC, ENT	Received

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Table 5. Other Water Quality Data

Waterbody	Water Quality Parameter	Data Source	Years Collected	Site(s) Identified	Status
San Diego Bay	Salinity	NAVY (SPAWAR)	2000-2002	Entire Bay	Not Received
		Port Of San Diego	2001	Shelter Island, Laurel Street Anchorage, Bay Bridge Anchorage, Sweetwater Channel, and Chula Vista Marina	Not Received
	Water Temperature	Port Of San Diego	2001	Shelter Island, Laurel Street Anchorage, Bay Bridge Anchorage, Sweetwater Channel, and Chula Vista Marina	Not Received
		NAVY (SPAWAR)	2000-2002	Entire Bay	Not Received
		NOAA CO-OPS	1993-Present	San Diego, CA (# 9410170)	Received
		SCRIPPS	1993	Data collected at 14 different locations	Not Received
	Conductivity	Port Of San Diego	2001	Shelter Island, Laurel Street Anchorage, Bay Bridge Anchorage, Sweetwater Channel, and Chula Vista Marina	Not Received
		SCRIPPS	1993	Data collected at 14 different locations	Not Received
Dana Point Harbor	Salinity				None Identified
	Water Temperature				None Identified
	Conductivity				None Identified

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Table 6. Special Studies

Type of Information	Source	Status
Bird Census	UCSD	Received
	San Elijo Lagoon Conservancy	Not Received
	San Diego Natural History Library – Final report not complete	Not Received
	Southwest Wetland Interpretive Association	Not Received
	UC Davis	Not Received
	Buena Vista Audborn Society	Not Received
Bacteria Die-off Rates	Steets B.M., and P.A. Holden. 2003. A Mechanistic Model of Runoff-associated Fecal Coliform Fate and Transport through a Coastal Lagoon. *Water Research* (2003)37:589-608	Received
	Crane, S.R., and J.A. Moore. 1986. Modeling enteric bacterial die-off: A review. *Journal of Water, Air, and Soil Pollution* (February 1986)27:411–439.	Received
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