

# Appendix D

## Responses to Comments

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**Pathogens  
in  
Richardson Bay  
Total Maximum Daily Load (TMDL)  
Responses To Comments**



**California Regional Water Quality Control Board  
San Francisco Bay Region**

**July 9, 2008**

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**PART I: STAFF RESPONSES TO WRITTEN COMMENTS ON THE  
FEBRUARY 8, 2008 STAFF REPORT AND PROPOSED BASIN PLAN  
AMENDMENT**

We received ten comment letters during the public comment period that closed on March 24, 2008. The comment letters and our responses are presented here in alphabetical order by commenter.

Comment letters received:

1. California Department of Transportation (Joyce Brenner)
2. City of Sausalito (Todd Teachout)
3. Floating Homes Association, Inc. (Stan Barbarich)
4. Marin County Development Agency (Brian Crawford)
5. Marin County Department of Public Work (Terri Fashing)
6. Pelican Harbor (Sara Flynn)
7. San Francisco Baykeeper (Sejal Choksi and Amy Chastain)
8. Sausalito-Marin City Sanitary District (Robert Simmons)
9. Sausalito Yacht Harbor (Jim Madden)
10. U.S. EPA (Janet Hashimoto)

**Comment Letter no. 1: California Department of Transportation (Caltrans), Joyce Brenner; March 21, 2008**

**Comment 1.1: "The Department strongly supports efforts to protect human health and achieve the best water quality possible."**

Comment noted.

**Comment 1.2: "...this TMDL proposes a very low value for load allocations for Pathogens carried by stormwater which has a potential to impact the Department's run off program in the Richardson Bay. The costs to reduce the bacteria count from stormwater run off from the Department would be significantly high as compared to a small water quality benefit. The compliance by the Department would most likely not affect bacteria levels in the Bay. In addition, the TMDL would set an unacceptable precedent for other locations with runoff into waterways currently listed as impaired by bacteria. We raised these issues in the workshop on September 25, 2007, and we noted that the Staff Report states that it is not expected that the Department will need to revise the current stormwater management plan. "**

The source of pathogen indicators in stormwater runoff originating from Caltrans' roadways in the Richardson Bay area is likely from wildlife, which is not a controllable source. The Basin Plan amendment requires no new implementation measures for Caltrans; therefore there are no new costs associated with this TMDL.

**Comment 1.3: "The Department is required to implement an applicable stormwater management plan. As you know, the Department has a statewide NPDES permit and stormwater management plan that identifies how the Department will comply with the provisions of the permit. The Department will continue to implement the procedures described in the stormwater management plan to ensure that the goals of the TMDL and water quality in the region are attained. "**

Comment noted.

**Comment 1.4: "The Department is required to: 'update/amend applicable stormwater management plan to include specific measures to reduce pathogen loading, including additional education and outreach efforts, and installation of additional pet waste receptacles.' The Department usually does not allow pets and does not install any pet waste receptacles on the state highways."**

The requirement stated by the commenter applies to entities other than Caltrans whom are named in Table 7.3 of the Basin Plan Amendment along with Caltrans. Caltrans is not expected to address pet waste in its stormwater management plan. Appropriate sections of the staff report and BPA have been revised for clarification as follows:

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Update/amend applicable stormwater management plan, as appropriate, to include specific measures to reduce pathogen loading, including additional education and outreach efforts, and installation of additional pet waste receptacles.

**Comment 1.5:** “In the discussion of the planned actions, at page 48, the staff report states we do not anticipate that Caltrans, Stormwater Management Plan will need to be revised because we believe the source of bacteria in highway runoff is wildlife. In addition, Section 9.4 at page 47 of the staff report states: The Water Board will not hold discharging entities responsible for uncontrollable coliform discharges originating from wildlife/natural background sources.

The Department agrees with the Regional Board staff that the source of bacteria in highway runoff is wildlife and that these are part of the natural/background loads to the bay. Nevertheless, the proposed BPA in Table 7-3 assigns stormwater runoff the following load allocation:

Categorical Pollutant Source	For Direct Discharges to the Bay Fecal Coliform (MPN/100 mL)	
	Median	90 <sup>th</sup> Percentile
Municipal Runoff	< 14	< 43

Caltrans is listed along with the cities and Marin County as being the parties required implementing the TMDL in Table 7-4, Trackable Implementation Measures, (page 5) of the proposed BPA. Based on the Department's statewide highway monitoring, median fecal coliform in highway runoff is 362 MPN/100 mL. The mean value is 1132 MPN/100 mL with a maximum density of 6,000 MPN/100 mL. This data is taken from the Discharge Characterization Study Report, 2003.<sup>1</sup> We understand it is not the intent of the Regional Board to apply the allocations as given in Table 7-3 of the proposed BPA to the Department; however, the proposed BPA contains no statements indicating that the allocations would not apply to the Department.

We request that the TMDL Report and Basin Plan Amendment specifically state the Department is not subject to the allocations in Table 7-3 to the extent that sewer breaks or related releases do not occur from the Department's MS4 and that the Department is not expected to change its existing stormwater management plan to address this TMDL.”

The TMDL provides Caltrans with a wasteload allocation equivalent to that given to all other entities that have the potential to discharge stormwater runoff to Richardson Bay. Based on our existing knowledge, no new requirements are created by this TMDL for Caltrans.

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**Comment 1.6: The Department is required to report to the Water Board on the progress toward implementation of pathogen reduction measures. We assume that the Department is not expected to implement changes to address the TMDL as discussed above. The Department currently issues an annual report to the Water Board that describes the actions taken toward meeting the Department stormwater management plan. The report includes descriptions of the efforts taken to achieve the goals of TMDLs throughout the state. We assume that this annual report as currently structured meets the requirements of the Water Board.**

Caltrans' assumption is correct. The annual stormwater pollution prevention reports submitted by Caltrans to the Water Board meet the reporting requirements of this Basin Plan amendment.

**Comment Letter no. 2: City of Sausalito, Todd Teachout; March 24, 2008**

**Comment 2.1: "Sausalito supports the goal of improving Richardson Bay water quality by improving management, operational and regulatory practices to limit pathogen discharges from sanitary sewers, storm drains, houseboats and vessels."**

Comment noted.

**Comment 2.2: "There appears to be a typographical error on page 2. Paragraph 1 refers to numeric targets presented in Table 8. The proposed amendment language excludes a Table 8."**

Thank you for pointing out this clerical error. The "Numeric Target" section of the Basin Plan amendment has been revised as follows:

The numeric targets (desired future conditions) proposed for pathogen indicators in Richardson bay are presented in ~~Table 8~~ Table 7-1.

**Comment 2.3: Samples from marinas, harbors, and the urban shoreline are not representative of Richardson Bay as a whole, and are unrepresentative of the areas where shellfish harvesting has historically taken place or may take place in the future.**

Staff agrees the samples are not representative of the historic shellfish bed location in Richardson Bay. However, shellfish harvesting is a designated existing beneficial use for the entire Richardson Bay at any location where there is habitat suitable to support shellfish, not only at the location of the historic shellfish beds.

The current water quality monitoring stations in the Bay do focus only on the marinas, harbors, and the urban shoreline along the western side of that Bay. This is because these areas have historically been determined to have the poorest water quality in the Bay. A bacterial water quality study conducted by Water Board staff in 1994 included sampling stations at other areas of the Bay, including stations at the Belvedere cove and Strawberry Point (in the vicinity of the historic shellfish beds). The results of this study indicated that the water quality at other areas of the Bay (e.g., near the location of historic shellfish beds and the eastern side of the Bay) were well below the water quality objectives for shellfish harvesting and water contact recreation. Therefore, those stations were eliminated from the subsequent monitoring studies.

**Comment 2.4: Evaluating attainment using samples taken at historic or potential shellfish harvesting areas would focus implementation efforts on protecting the potential shellfish harvesting beneficial use."**

Staff agrees. Please also see response to comment 2.3 above.

**Comment 2.5: There is only a tenuous quantitative association between coliform levels in fresh and marine waters and risk to human health from ingestion of those waters. The risk from ingestion of shellfish is even more uncertain. The uncertainties are not adequately addressed in the Staff Report.**

Staff disagrees that the uncertainties are not adequately addressed in the Staff Report. Coliform organisms are the only pathogen indicator organisms currently recommended by the US EPA for use in developing TMDLs for impaired waterbodies with shellfish harvesting beneficial use. Although not perfect, coliform organisms have been the primary indicators widely used for more than a century to indicate fecal contamination and the potential presence of waterborne pathogens in the environment.

The proposed TMDL coliform water quality targets are the same as the Basin Plan's water quality objectives for protecting water contact recreation and shellfish harvesting beneficial uses. Additionally, the water quality targets for the shellfish harvesting beneficial use are the same as those established by the United State Food and Drug Administration (US FDA) through the National Shellfish Sanitation Program and used by the California Department of Public Health to regulate shellfish growing waters.

The Basin Plan amendment also includes a target for enterococci to address the risk to human health from recreational uses.

**Comments 2.6: Sporadic exceedances of coliform water quality objectives do not necessarily imply that the shellfish harvesting use is impaired.**

We agree that there could be some circumstances where an occasional exceedance wouldn't necessarily indicate that the use is impaired. However, fecal coliform standards in some portions of Richardson Bay have been consistently exceeded as far back as the 1970s to the present. Further, Richardson Bay is listed as impaired in the Clean Water Act Section 303(d) water body list due to exceedances of coliform water quality objectives for both shellfish harvesting and water contact recreation.

**Comment 2.7: If the number of sample sites is to remain constant we advocate abandoning some sites along the Sausalito shoreline and adding other sites nearer to or within the shellfish fisheries as well as other areas of Richardson's Bay.**

This is something that can be considered as the monitoring program is revised. Water Board staff would like to work with other parties to collaborate on the monitoring program.

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**Comment 2.8:** The allocation to stormwater of a median MPN/100 mL < 14 and a 90th percentile MPN/100 mL < 43 (Table 7-3) may not be achievable-depending on where measurements are made. It would make little sense to measure stormwater itself; rather the measurement should be made at those locations within the Bay where the shellfish harvesting use could potentially and feasibly take place.

As stated in response to comment 2.3 above, shellfish harvesting as well as water contact recreation are designated beneficial uses for the entire Bay, including potentially the receiving waters in the vicinity of the numerous storm drain outfalls owned by the City of Sausalito. Water Board staff will collaborate with local entities to establish a meaningful monitoring program; monitoring stormwater itself is not required by the TMDL.

**Comment 2.9:** Alternatively, the allocation for stormwater measured upstream of outfalls should account for attenuation and die-off of organisms between the outfall location and where the beneficial use could potentially and feasibly take place.

The data do not exist at this time to establish the wasteload allocation in the manner suggested here. This issue could be evaluated as part of adaptive implementation should these data become available.

**Comment 2.10:** While sanitary sewer systems, houseboats, and vessels are already required to achieve zero discharge to Richardson Bay (i.e., are prohibited from discharging), stormwater discharges cannot be prevented without significant changes to the drainage and utility laws and the creation of new funding sources. Adoption of the load allocation in Table 7-3 without this change could potentially place Marin municipalities in a situation where there is no beneficial use impairment. Instead regulatory noncompliance could trigger additional monitoring and reporting and thereby divert resources needed to implement local pollution-prevention programs. Though water board staff has assured local authorities that no additional legal claims will arise from non-compliance, we remain skeptical.

The commenter appears to be concerned about being in non-compliance for exceeding the allocations even though no actual shellfish harvesting may be occurring. Compliance would be determined based on requirements in a permit. Refinement of the shellfish harvesting beneficial use would require the acquisition of additional information.

**Comment 2.11:** City of Sausalito can support adoption of the implementation measures listed in Table 7-4.

Comment noted.

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**Comment 2.12: The approach to imbed discussions of past regulatory and adaptive implementation efforts in the background sub-topic areas are limiting. Implementing the plan has been a multi-decade effort. Past bodies of knowledge need to be recognized and the past regulatory efforts should be summarized in this section for the current stewards be they elected, appointed or hired staff.**

Staff has made an effort to provide a complete summary overview of the past regulatory and implementation efforts. A greater discussion of the history of the regulatory and implementation efforts as suggested by the commenter would be too exhaustive for, and outside of the scope of, this TMDL's staff report.

**Comment 2.13: The staff report is silent on existing regulations regarding fecal coliform. The California Department of Health promulgates regulations and standards for coliform contact in Humans and has coordinated a monitoring program for public beaches. To the extent that the proposed regulations duplicate the Department of Health or existing County Health regulations regarding water quality, they should be deleted. Those existing regulations can then be cited by reference.**

Staff disagrees that the staff report is silent on existing regulations, or that the proposed regulations duplicate other regulations regarding water quality. The staff report does discuss "existing regulations regarding coliforms" as follows:

At present, federal and state standards used to assess water quality for shellfish growing (the most sensitive beneficial use of the Bay in terms of becoming impaired by pathogens) and protect public health are all based on coliform bacteria concentrations.

Further, Schoonmaker Beach is the only beach in Richardson Bay monitored by the Marin County Environmental Health Services (MCEHS) under the requirements of the California Department of Public Health (CDPH) regulations. The CDPH as well as MCEHS, among other standards, use the same fecal coliform standards proposed in the TMDL to evaluate water quality at Schoonmaker Beach. However, there is no overlap between the CDPH and/or MCEHS regulations and those proposed in the TMDL. The CDPH beach regulations merely require MCEHS to post beach closure signs if water quality standards at a given beach have been exceeded. This TMDL does not require such action.

**Comment 2.14: The Problem Statement (Section 3.1) should summarize the uncertainties associated with the statements therein. In particular, the chain of inference--from the presence of fecal coliform bacteria, to the presence of pathogens, to human health risk-has not been quantified.**

As explained in response to comment 2.5 above, while not perfect, coliform organisms are well-established and widely utilized indicators of fecal contamination and risk to

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human health. As such, there is no need to quantify the presence of fecal coliform bacteria, to the presence of pathogens, to human health risk.

**Comment 2.15: The Project Objectives (Section 3.3) should note that, to protect the shellfish harvesting beneficial use, the objectives for shellfish harvesting need only be met in areas where shellfish harvesting could potentially occur.**

Staff disagrees that the project objectives need to be modified. The project objective as written, “to protect existing and potential uses of recreation and shellfish harvesting in Richardson Bay,” implicitly addresses this concern. By definition, the shellfish harvesting beneficial use applies to waters that support habitats suitable for the collection of shellfish.

**Comment 2.16: The discussion of the use of fecal coliform bacteria as indicators for pathogens (Section 4.1) should note there is only a weak quantitative relationship between fecal coliforms and pathogens and should also note there is an even weaker quantitative relationship between the presence of fecal coliform in water and the incidence of disease from consuming shellfish.**

Staff disagrees. Please see response to comment 2.5 above.

**Comment 2.17: Section 4.2 (Water Quality Standards) should note the shellfish harvesting beneficial use is based on historic and potential shellfish harvesting, that there has not been shellfish harvesting in Richardson Bay for 40-50 years, and that the water-quality data which form the basis of the 303(d) listing were obtained in areas in which shellfish harvesting does not occur and would not be possible, as is documented in Section 4.4.**

Shellfish harvesting is a designated beneficial use for the entire Bay and includes both recreational and commercial harvesting that could take place in locations within the Bay other than at the historic shellfish beds. Shellfish harvesting is the subject of planned statewide studies to evaluate current existing uses and it is likely that surveys will be conducted to document these uses in the near future. The water-quality data that form the basis of the 303(d) listing were obtained in areas of the Bay where shellfish exist and where shellfish harvesting is possible.

**Comment 2.18: Section 4.5 (Recent Bacterial Monitoring Data) should note that the correlation between elevated fecal coliform in wet-season samples as compared to dry-season samples could be due to increased mixing and turbidity, as well as other potential causes.**

Staff disagrees as, at this point, staff has no information to suggest that “the correlation between elevated fecal coliform in wet-season samples as compared to dry-season

samples could be due to increased mixing and turbidity.” Further, section 4.5 of the staff report states that:

During winter 2007 monitoring ...the relatively mild increase observed in both the concentrations and the number of wet season exceedances may be attributed to wet-season-specific sources such as stormwater runoff and sanitary sewer overflows. However, as mentioned above, only one of the five wet-season sampling events coincided with an actual rainfall event. Therefore, no definitive conclusions could be made as to what are the actual contributions from season-specific sources, such as stormwater runoff and sanitary sewer overflows, in Richardson Bay.

This discussion adequately addresses the uncertainty in attributing the increase observed in both the concentrations and the number of wet season exceedances to wet-season-specific sources such as stormwater runoff and sanitary sewer overflows.

**Comment 2.19: The last paragraph of Section 4.5 should be made clearer with regard to the TMDL process. The TMDL process generally presumes contributions of loads from various sources into a well-mixed water body. "Relative contributions" from various sources is of less relevance in this TMDL which is not based on loads but is instead "density based." In this case, the "contributions" (loads) of coliforms from stormwater or sanitary sewer overflows are not very relevant.**

The fact that the proposed load allocations for this TMDL are based on bacterial density and not bacterial mass does not mean that determining the relative contributions from various sources is of less relevance to this TMDL. Stormwater runoff and sanitary sewer overflows have been identified as two potential sources of pathogens in Richardson Bay; the commenter presents no specific information to say why the contributions of coliforms from these sources are not relevant.

**Comment 2.20: Therefore the last three sentences of this paragraph, including the statements about monitoring, should be deleted as the monitoring approach described is not relevant to the TMDL project objectives-nor is it technically sound.**

Staff disagrees. The commenter states that the proposed monitoring recommendations are not technically sound, however, they do not provide an explanation and/or reasoning as to why they are not. The last three sentences of Section 4.5 of the staff report refer to the fact that no conclusions about contributions from stormwater runoff or sanitary sewer overflows can be made at this time but that additional wet-weather monitoring could help our understanding of this issue.

Determining the relative contributions of various sources to the pathogen pollution is relevant to the stated project objectives of: “protecting existing and potential beneficial

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uses of recreation and shellfish harvesting in Richardson Bay, and attaining water quality objectives in as short a time as feasible.”

**Comment 2.21: In Section 4.7, it is noted that the data provides "a consistent picture of widespread, but somewhat localized potential pathogen impairment. Data indicate that houseboats consistently have been and still are a significant source of potential pathogen pollution in the Bay. They also indicate that vessel discharges in certain recreational boat marinas are a significant potential pathogen source." It should be noted here, as well as elsewhere, that the houseboats and recreational boat marinas are well removed from historic or potential shellfishing areas and that there is no evidence that the discharges significantly affect coliforms levels in those areas.**

Staff agrees with the statement that “the houseboats and recreational boat marinas are removed from historic shellfishing areas” and that due to the lack of monitoring data, “there is no evidence that the discharges significantly affect coliforms levels” in the historic shellfish beds areas. However, as explained in response to comment 2.3 above, aside from the historically known shellfish beds, shellfish harvesting is currently a designated use for the entire Bay, and must therefore, be protected in all areas of the Bay.

**Comment 2.22: Also in Section 4.7, the last sentence should be deleted, as additional wet-weather monitoring would be unlikely to achieve better characterization of the magnitude and relative contributions from sanitary sewer overflows and stormwater.**

The commenter has proposed deleting a sentence from the staff report that states:

However, to better characterize the magnitude and the relative contributions from these sources, additional wet-weather monitoring is needed.

Staff disagrees with this proposal. There is limited available wet-season monitoring and additional wet-weather monitoring would be needed to achieve better characterization of the magnitude and relative contributions from sanitary sewer overflows and stormwater runoff sources.

**Comment 2.23: In Section 6.3, the discussion of the relative percentage of exceedances during the wet season and dry season should include a statistical analysis of the likelihood that the difference in relative percentages is due to chance rather than a difference in actual conditions. Without such an analysis, these data should not be used to support "the conclusion that stormwater runoff could potentially be a source of pathogens loading to the Bay."**

Staff disagrees with commenter’s recommendation that without a statistical analysis of the existing data we cannot say that stormwater runoff is a potential source of pathogens

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to the Bay. The Staff report concludes that the dry versus wet season data do not support a definitive conclusion about the actual contributions from stormwater, as exceedances of objectives were measured during both seasons. More data should be collected during the wet season and analyzed statistically, during implementation of the TMDL, to better understand the contributions from stormwater.

**Comment 2:24: Also in Section 6.3, the last three sentences regarding the need for additional monitoring should be deleted as the monitoring approach described is not relevant to the TMDL project objectives nor is it technically sound.**

The commenter has proposed deleting three sentences from the staff report that state:

However, as mentioned in Section 4 above, only one of the five wet-season sampling events coincided with an actual rainfall event. Therefore, no definitive conclusions could be made as to what the actual contributions from stormwater runoff are in Richardson Bay. To better characterize the magnitude and the relative contributions from these sources, additional targeted wet-weather monitoring is need.

Staff disagrees with this proposal. There is limited available wet-season monitoring and additional wet-weather monitoring would be needed to achieve better characterization of the magnitude and relative contributions from sanitary sewer overflows and stormwater runoff sources.

**Comment 2.25: In Section 7.5 (Seasonal Variation), in the first sentence, the phrase "due to factors such as stormwater runoff" should be deleted as there has been no statistical analysis as to whether the data support this conclusion.**

Staff disagrees with the suggestion that part of the first sentence in section 7.5 should be deleted. Stormwater runoff is just one of the factors to consider in assessing wet season versus dry season sampling results. No conclusions have been made and thus a statistical analysis isn't necessary.

**Comment 2.26: Because this is a density-based TMDL, Section 8 (Linkage Analysis) must discuss the geographic relationship between the identified sources (houseboats and marinas) and the uses (water-contact recreation and shellfishing), and the extent to which discharges at the source locations may affect, or not affect, water quality where the uses actually occur or could potentially occur.**

The fact that this is a density-based TMDL does not affect the way the "linkage analysis" is performed thus there is no need to discuss the geographic relationship between the identified sources and the uses. The linkage analysis establishes the relationship between the pollutant loading from identified sources and the numeric targets chosen to

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protect the beneficial uses. For this TMDL, staff asserts that the proposed load allocations protect the beneficial uses (i.e., linkage between the load allocations and protective numeric targets is established) because:

- Fecal waste from warm-blooded animals can contain pathogens;
- Fecal coliform bacteria are present in fecal waste from warm-blooded animals and are routinely used as a monitoring surrogate for pathogens;
- The proposed density-based load allocations are identical or more stringent than proposed numeric water quality targets;
- The proposed numeric targets are the same as current Basin Plan bacterial water quality objectives for shellfish harvesting and water contact recreation waters; and
- The Basin Plan water quality objectives, which are conservatively based on epidemiological studies, are protective of beneficial uses.

**Comment 2.27: Past efforts have focused on detection and concentrations at the sample site. There is little or no effort made to evaluate the mechanisms in place in the Bay as a reactor. Sausalito recommends that policies, regulations and funding be provided to enable a monitoring study design that**

- 1. Determines concentration gradations at all areas in the Bay**
- 2. Evaluates the tidal and seasonal affects.**

Staff agrees with the commenter's recommendation for design and implementation of a robust water quality monitoring program for Richardson Bay. Staff intends on working with interested parties in order to design and implement such monitoring.

**Comment 2.28: The identified monitoring stations do not create an adequate monitoring network to evaluate water quality in Richardson's Bay. It must be changed to better report on quality in the Bay in general and at the beaches and shellfish fisheries in particular.**

Please see response to comment 2.27.

**Comment Letter no. 3: Floating Homes Association, INC., Stan Barbarich;  
March 21, 2008**

**Comment 3.1: There are no "houseboats" berthed in any floating home marinas in Richardson's Bay, nor are there any "houseboat marinas" in Richardson's Bay. Given that your intent is regulatory, the terminology you use to identify potential sources of contamination must be correct. The California Health and Safety Code, Section 18075.55 defines "Floating Home" as follows:**

**(d) Floating home, as used in this section, means a floating structure which is all of the following:**

- (1) It is designed and built to be used, or is modified to be used, as a stationary waterborne residential dwelling.**
- (2) It has no mode of power of its own.**
- (3) It is dependent for utilities upon a continuous utility linkage to a source originating on shore.**
- (4) It has a permanent continuous hookup to a shoreside sewage system.**

**Therefore, please modify your verbiage to identify floating homes as such, and to differentiate them from other vessels.**

Floating homes or houseboats, as referred to in the staff report and the Bain plan amendment, as well as all other historic documents related to this subject reviewed by staff, are differentiated from "vessels" throughout the staff report and the Basin Plan amendment. In these documents, "houseboats" are defined as non-navigable structures whereas "vessels" are defined as navigable recreational, anchor-out, and live-aboard structures. These definitions clearly separate houseboats from all vessels. Nonetheless, section 2.4 of the staff report has been revised to better clarify the distinction between houseboats (floating homes) and vessels, as follows:

**2.4 Houseboats (Floating Homes) and Residential Vessels and Floating Structures**

In all of San Francisco Bay, Richardson Bay is home to the largest number of houseboats (non-navigable structures used as residences also known as floating homes) ~~marina~~ and residential vessels (navigable structures also known as live-aboards) ~~and floating structures~~ used for long-term residential purposes.

**Comment 3.2: Vessels that are anchored out are, by definition, not floating homes. Nor are any vessels that are berthed in recreational marinas, unless they comply with all of the above provisions. Anchored out vessels, as well as those moored in recreational marinas, must be required to pump out into an approved shoreside facility, or into a "honey barge."**

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The TMDL implementation plan requires these measures.

**Comment 3.3: Houseboats can only be evaluated as a part of the group of vessels which are berthed in recreational marinas and included in measurements taken there. RWQCB evaluations and standards should not confuse the two.**

Evaluation and standards does not confuse houseboats (non-navigable floating structures) with vessels (navigable recreational, anchor-out, live-aboard structures). Please see response to comment 3.1 above for more information.

**Comment 3.4: As a statement of policy, the Floating Homes Association considers excellent water quality to be a top priority. Nobody wants clean water more than those of us who live on the water. Therefore, it is our policy that every floating homeowner and occupant, and every floating home marina operator, should diligently pursue a zero-discharge policy and take every reasonable measure available to ensure achievement of that goal.**

Comment noted.

**Comment 3.5: All floating home owners should regularly inspect and carefully maintain their sewage discharge systems, to ensure zero leakage.**

Staff interpreted this comment to be supportive of the TMDL Implementation Plan.

**Comment 3.6: All floating home marina operators should also regularly inspect and maintain their sewage systems, to achieve zero leakage. Further, to prevent accidental spills into bay waters from floating homes or the marina sewage lift stations, all lift stations (both floating home and recreational marinas) should be required to be equipped with adequate backup electrical generators to ensure operation of those facilities in case of power outages.**

Comment noted.

**Comment 3.7: When agencies conduct water testing in floating home and recreational marinas, best efforts should be made to differentiate storm water drain outflow measurements from measurements of any discharge from the homes or marinas or recreational vessels, so that corrective measures can be taken by the appropriate party.**

Staff agrees.

**Comment 3.8: It is our opinion that, once the planned Waldo Point Harbor reconstruction is completed and the Gates group of floating homes are thereby brought up to code, the testing results that have historically and currently show**

unacceptable contamination levels will be vastly different and will then compare favorably with results at other marina testing points. This is, we hope, a goal that will be achieved in the near term. Its achievement is only limited by the need for two agencies to decide who has jurisdiction over a portion of the project. Once this is decided, work on harbor facilities and on the Gates homes can be accomplished. This is a top priority matter for marina owners and residents.

Comment noted.

**Comment 3.9: As to the specific TMDL standards that are proposed, we believe that it is a lofty, unnecessary and unachievable goal to utilize shellfish-safe standards. As we understand it from Water Board staff statements on March 12, this goal is based upon some questionable historical shellfish beds, mainly in the Strawberry area that may or may not have been used at some point in history by indigenous native persons. It was broadly acknowledged at the workshop that, between rain water runoff and some unavoidable discharge from sewage treatment systems due to mechanical failure, it is impossible to achieve pristine conditions, 100% of the time.**

Currently, shellfish harvesting is a Basin Plan-designated beneficial use of the Bay and may potentially take place at any location within the Bay. The proposed water quality target for shellfish harvesting is needed because TMDLs must be designed to protect all designated beneficial uses of a given waterbody. If in the future, it is determined that the shellfish harvesting beneficial use is not an existing use in Richardson Bay and this use is removed from the Basin Plan, the TMDL and its targets will be revised accordingly. No statements to the contrary were made at the workshop the commenter is referring to.

**Comment 3.10: Further, as there is apparently no evidence of shellfish farming or gathering in Richardson's Bay being conducted by anyone currently alive, this unconfirmed, archaic use seems spurious as a reason for applying specific water quality standards.**

Currently, there is no evidence that shellfish harvesting does not occur in Richardson Bay as no recent survey has been done. Practically, any person could walk or boat to many locations within the Bay (e.g., pilings and docks in various marinas and harbors) and harvest shellfish (e.g., mussels) without being tracked. See also response to comment 2.17 regarding statewide surveys planned to evaluate the shellfish harvesting beneficial use.

**Comment 3.11: We suggest that you preserve limited fiscal and staff resources at all the involved agencies to conduct the intense scrutiny and operational diligence required to achieve such high standards for application in Tomales Bay and other legitimate shellfishing grounds.**

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Comment noted.

**Comment 3.12: Body-contact recreational standards are reasonable, appropriate and achievable and should be the only standards you establish for Richardson's Bay.**

Currently, both shellfish harvesting and water contact recreation are designated beneficial uses of the Bay. Therefore, the TMDL must be designed to attain and maintain the water quality "standards" for both beneficial uses.

**Comment 3.13: Finally, we were gratified to hear RWQCB staff state at the workshop that the specific "numbers" were not what you hoped people would focus on, rather that progress toward zero avoidable discharge was the actual goal. Many people had been concerned that Zealous pursuit of the achievement of specific numbers would lead to onerous enforcement programs. FHA wholeheartedly supports this zero-avoidable-discharge goal.**

Comment noted.

**Comment Letter no. 4: Marin County Community Development Agency (CDA), Brian Crawford; March 21, 2008**

**Comment 4.1:** In general, the CDA supports the overall objective of protecting and enhancing water quality and beneficial uses against pathogen impairment by establishing numeric water quality standards. We also support the Water Board's objective of avoiding regulatory requirements that are overly stringent with respect to attaining those standards.

Comment noted.

**Comment 4.2:** The proposed water quality objectives are intended to protect shellfish harvesting as one of two beneficial uses designated by the Basin Plan. Although we understand that shellfish harvesting may be firmly grounded in the Basin Plan, and derived from the Clean Water Act, we question the appropriateness of imposing a mandatory and very stringent water quality objective based on a mariculture activity that has no contemporary relevance to Richardson Bay (input from local residents familiar with the history of Richardson Bay suggests that shellfish harvesting has not occurred in the last 40-50 years).

As noted, shellfish harvesting is one of the Richardson Bay beneficial uses designated in the Basin Plan. To address this comment staff would have to undertake a Basin Plan amendment to remove the use from the Basin Plan. This would require a formal procedure following Clean Water Act regulations in order to remove or refine the use. The TMDL includes adaptive implementation, whereby the shellfish harvesting beneficial use in the Basin Plan may be evaluated, depending on information collected as part of the implementation plan.

**Comment 4.3:** Compounding this issue is the seemingly improbable prospect of attainment of the shellfish harvesting water quality objective by implementing parties.

Whether or not the shellfish harvesting water quality objectives are attainable will not be known until all reasonable and feasible management measures have been implemented. At this point, it would be premature to conclude that these objectives could not be attained. Recent water quality monitoring data (see section 4 of the staff report) show that these objectives are already being attained in some areas and mildly exceeded at some other areas (with the exception of two areas which exhibit large exceedances). Effective and prompt implementation of proposed corrective measures may very well result in attainment of shellfish harvesting water quality objectives in most if not all areas of the Bay.

**Comment 4.4:** Reestablishing shellfish harvesting on Richardson Bay is an admirable endeavor that we support, notwithstanding factors that suggest this proposition may be difficult to realize given the land use characteristics that surround the historic shellfish beds identified in the Water Board staff report (Figure 2). Furthermore, the County is certainly not averse to pursuing and implementing regulatory programs aimed at achieving a high level of environmental protection for a broad base of resource values. However, the proposed TMDL standards may benefit from balancing ambition with reality over time. That is to say we would like to be in a position of having a fighting chance at attaining a meaningful standard(s), such as the water quality objective for water contact recreation, at the outset of this important Basin Plan Amendment and consider the possibility of moving in the future toward increasingly stringent standards if warranted.

We will be evaluating all targets in the TMDL including water quality objectives protective of water contact recreation and will thus be able to evaluate incremental changes in water quality.

**Comment 4.5:** The implementation measures outlined in the proposed Basin Plan Amendment (Table 7-4) have cost implications for the County, RBRA and other implementing parties with respect to allocation of staff resources and hard costs. Although it is difficult to assess with precision the fiscal impacts of the measures being recommended, we nonetheless have concerns about incurring additional costs that may be difficult to fund while budgets are being reduced to address current structural imbalances and State funding cuts. Other implementing parties undoubtedly have the same concern and may be subject to similar funding constraints.

Comment noted. The Staff Report, section 11.7 includes a consideration of economic factors, specifically cost estimates for reasonably foreseeable implementation measures.

**Comment 4.6:** Any guidance the Water Board staff may be able to provide the County and other affected agencies regarding potential funding sources for program implementation that may be available at the State or Federal level would be very much appreciated. We are not familiar with any prescriptions the Water Board may have for use of penalty fees assessed for Clean Water Act violations; however, if legally permissible, penalty fees could perhaps be considered as a potential funding source to assist with off-setting some of the cost associated with implementing TMDL measures.

Staff of the San Francisco Bay Water Board cannot prescribe how penalty fees are used. The process of establishing priorities for use of penalty fees is something that may be undergoing reconsideration in the future. We will also do our best to notify all

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implementing parties of any potential funding sources which could be available to offset some of the cost associated with implementing TMDL measures.

**Comment 4.7: The implementation measures also assign responsibility to Marin County and the RBRA for ongoing evaluation of the adequacy and performance of sewage collection systems in floating home (houseboat) and vessel marinas. The language used to describe this action is somewhat vague with respect to defining the specific enforcement expectations and authorities that are being placed on, or would be relied upon, by the County, RBRA and other local agencies that regulate marinas, namely the City of Sausalito. This issue should be clarified between the affected regulatory agencies, Water Board staff, and marina owners and floating home representatives.**

Staff is committed to working with the local agencies to develop a workable approach, to fulfill the objectives of the implementation plan. The TMDL doesn't create new authorities and relies on existing enforcement capabilities. We look forward to working with the RBRA and Marin County and the City of Sausalito on these issues.

**Comment 4.8: In closing, the CDA supports the process of adaptive implementation, especially as it may pertain to the Water Board's future re-evaluation of the attainability and applicability of the shellfish harvesting beneficial use and TMDL standard should they be adopted as currently proposed. The concerns we have expressed above are tempered by our understanding that compliance with the TMDL standards will be more a function of the ability of implementing parties to demonstrate that a reasonable effort has been made to attain or achieve progress toward the water quality objectives rather than strict adherence with the numeric targets. In that context we stand committed to working with the Water Board staff and other affected implementing parties on our mutual interest and efforts at protecting and enhancing the water quality and uses of Richardson Bay.**

Comment noted. Staff appreciates CDA's commitment and willingness to work with the Water Board staff and other affected implementing parties to protect and enhance the water quality and uses of Richardson Bay.

**Comment Letter no. 5: Marin County Department of Public Work, Terri Fashing; March 24, 2008**

**Comment 5.1: MCSTOPPP strongly supports this TMDL's overarching goal of improving Richardson Bay water quality by preventing potential pathogens from entering the Bay and its tributaries.**

Comment noted.

**Comment 5.2: The BPA should state how attainment of the shellfish harvesting designated use (Table 7-1) is to be measured and determined.**

The TMDL is designed to resolve pathogen discharges. Attainment of the shellfish harvesting beneficial use will be determined according to the "California impaired waterbody delisting factors for bacteria in water" described in section 4 of the "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" (CSWRCB, 2004). Staff will use this policy to examine attainment of beneficial uses by reviewing monitoring data every few years. This is an existing policy and does not need to be included in the Richardson Bay pathogens TMDL Basin Plan amendment.

**Comment 5.3: The evaluation of attainment [of the shellfish harvesting beneficial use] should be based on measurements at or near historic or potential shellfish harvesting areas.**

Staff agrees.

**Comment 5.4: Likewise, in the BPA the TMDL (Table 7-2) states the number and timing of samples which are to be taken for the purpose of evaluating attainment. It should also say measurements are to be made at historic or potential shellfish harvesting areas.**

Staff disagrees. Table 7-2 of the Basin Plan amendment does not state the number and timing of samples that are to be taken for the purpose of evaluating attainment. This table shows Richardson Bay's density-based pathogens TMDL, expressed as fecal coliform bacteria concentrations. In other words, it states the allowable pathogen levels from various sources of pollution.

**Comment 5.5: Samples from marinas, harbors, and the urban shoreline are not representative of Richardson Bay as a whole, and are unrepresentative of the areas where shellfish harvesting has historically taken place or may take place in the future.**

See response to comment 2.3 above.

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**Comment 5.6: Evaluating attainment using samples taken at historic or potential shellfish harvesting areas would focus implementation efforts on protecting the potential shellfish harvesting beneficial use.**

Staff agrees. Please also see response to comment 2.3 above.

**Comment 5.7: There is only a tenuous quantitative association between coliform levels in fresh and marine waters and risk to human health from ingestion of those waters. The risk from ingestion of shellfish is even more uncertain. The uncertainties are not adequately addressed in the Staff Report.**

Please see response to comment 2.5 above.

**Comments 5.8: Sporadic exceedances of coliform water quality objectives do not necessarily imply that the shellfish harvesting use is impaired.**

Please see response to comment 2.6 above.

**Comment 5.9: The allocation to stormwater of a median MPN/100 mL < 14 and a 90th percentile MPN/100 mL < 43 (Table 7-3) may not be achievable—depending on where measurements are made. It would make little sense to measure stormwater itself; rather the measurement should be made at those locations within the Bay where the shellfish harvesting use could potentially and feasibly take place.**

We understand MCSTOPP's perspective. Staff looks forward to working with MCSTOPP on the development of a robust monitoring plan. Please also see response to comment 2.3 above.

**Comment 5.10: Alternatively, the allocation for stormwater measured upstream of outfalls should account for attenuation and die-off of organisms between the outfall location and where the beneficial use could potentially and feasibly take place.**

Please see response to comment 2.9 above.

**Comment 5.11: While sanitary sewer systems, houseboats, and vessels are already required to achieve zero discharge to Richardson Bay (i.e., are prohibited from discharging), stormwater discharges cannot be prevented. Adoption of the load allocation in Table 7-3 without this change could potentially place Marin municipalities in a situation where no actual use impairment might exist, but "paper noncompliance" could trigger additional monitoring and reporting and thereby divert resources needed to implement local pollution-prevention programs.**

Please see response to comment 2.10 above.

**Comment 5.12: MCSTOPPP supports adoption of the implementation measures listed for stormwater runoff in Table 7-4.**

Comment noted.

**Comment 5.13: The Problem Statement (Section 3.1) should summarize the uncertainties associated with the statements therein. In particular, the chain of inference--from the presence of fecal coliform bacteria, to the presence of pathogens, to human health risk-has not been quantified.**

As explained in response to comment 2.5 above, while not perfect, coliform organisms are well-established and widely utilized indicators of fecal contamination and pose a risk to human health. As such, there is no need to quantify "...the presence of fecal coliform bacteria, to the presence of pathogens, to human health risk."

**Comment 5.14: The Project Objectives (Section 3.3) should note that, to protect the shellfish harvesting beneficial use, the objectives for shellfish harvesting need only be met in areas where shellfish harvesting could potentially occur.**

Please see response to comment 2.15 above.

**Comment 5.15: The discussion of the use of fecal coliform bacteria as indicators for pathogens (Section 4.1) should note there is only a weak quantitative relationship between fecal coliforms and pathogens and should also note there is an even weaker quantitative relationship between the presence of fecal coliform in water and the incidence of disease from consuming shellfish.**

Staff disagrees. Please see response to comment 2.5 above.

**Comment 5.16: Section 4.2 (Water Quality Standards) should note the shellfish harvesting beneficial use is based on historic and potential shellfish harvesting, that there has not been shellfish harvesting in Richardson Bay for 40-50 years, and that the water-quality data which form the basis of the 303(d) listing were obtained in areas in which shellfish harvesting does not occur and would not be possible, as is documented in Section 4.4.**

Please see response to comment 2.17 above.

**Comment 5.17: Section 4.5 (Recent Bacterial Monitoring Data) should note that the correlation between elevated fecal coliform in wet-season samples as compared to dry-season samples could be due to increased mixing and turbidity, as well as other potential causes.**

See response to comment 2.18 above.

**Comment 5.18:** The last paragraph of Section 4.5 should be made clearer with regard to the TMDL process. The TMDL process generally presumes contributions of loads from various sources into a well-mixed water body. "Relative contributions" from various sources is of less relevance in this TMDL which is not based on loads but is instead "density based." In this case, the "contributions" (loads) of coliforms from stormwater or sanitary sewer overflows are not very relevant.

Staff disagrees with the suggestion that in the case of this TMDL the ""contributions" (loads) of coliforms from stormwater or sanitary sewer overflows are not very relevant." Please see response to comment 2.19 above.

**Comment 5.19:** Therefore the last three sentences of this paragraph, including the statements about monitoring, should be deleted as the monitoring approach described is not relevant to the TMDL project objectives-nor is it technically sound.

Staff disagrees. Please see response to comment 2.20 above.

**Comment 5.20:** In Section 4.7, it is noted that the data provides "a consistent picture of widespread, but somewhat localized potential pathogen impairment. Data indicate that houseboats consistently have been and still are a significant source of potential pathogen pollution in the Bay. They also indicate that vessel discharges in certain recreational boat marinas are a significant potential pathogen source." It should be noted here, as well as elsewhere, that the houseboats and recreational boat marinas are well removed from historic or potential shellfishing areas and that there is no evidence that the discharges significantly affect coliforms levels in those areas.

Please see response to comment 2.21 above.

**Comment 5.21:** Also in Section 4.7, the last sentence should be deleted, as additional wet-weather monitoring would be unlikely to achieve better characterization of the magnitude and relative contributions from sanitary sewer overflows and stormwater.

Staff disagrees. Please see response to comment 2.22 above.

**Comment 5.22:** In Section 6.3, the discussion of the relative percentage of exceedances during the wet season and dry season should include a statistical analysis of the likelihood that the difference in relative percentages is due to chance rather than a difference in actual conditions. Without such an analysis, these data should not be used to support "the conclusion that stormwater runoff could potentially be a source of pathogens loading to the Bay."

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Staff disagrees. Please see response to comment 2.23 above.

**Comment 5.23:** Also in Section 6.3, the last three sentences regarding the need for additional monitoring should be deleted as the monitoring approach described is not relevant to the TMDL project objectives nor is it technically sound.

Please see response to comment 2.24 above.

**Comment 5.24:** In Section 7.5 (Seasonal Variation), in the first sentence, the phrase "due to factors such as stormwater runoff" should be deleted as there has been no statistical analysis as to whether the data support this conclusion.

Please see response to comment 2.25 above.

**Comment 5.25:** Because this is a density-based TMDL, Section 8 (Linkage Analysis) must discuss the geographic relationship between the identified sources (houseboats and marinas) and the uses (water-contact recreation and shellfishing), and the extent to which discharges at the source locations may affect, or not affect, water quality where the uses actually occur or could potentially occur.

Please see response to comment 2.26 above.

**Comment 5.26:** In Section 10.2 (Water Quality Monitoring), Table 18, MCSTOPPP should be deleted from the list of sampling entities as we are not currently engaged in the monitoring of Bay waters, have no expertise in such monitoring, and are not interested in canceling a portion of our pollution-prevention activities in order to divert funds to pay for monitoring.

Staff looks forward to working with MCSTOPPP to see if there is monitoring that can be done collaboratively with other local parties. Monitoring by MCSTOPPP is not a requirement of the Basin Plan amendment. Section 10.2 of the staff report has been modified as follows:

Table 18 outlines the existing locations, constituents, sampling frequency, and a list of the responsible sampling entities parties. the Water Board staff will collaborate with these sampling entities to create for the a long-term water quality monitoring program for the Bay that meets the monitoring program objectives stated above.

**Comment 5.27:** In addition, the monitoring approach should be revisited and reconsidered. It would make the most sense to fully implement the controls described in Section 9 for houseboats and marinas before conducting limited follow-up sampling in those areas to confirm the effectiveness of the additional measures.

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**Because of the sporadic and variable nature of stormwater discharges and sanitary sewer overflows, it is very unlikely that water-quality monitoring would be able to detect a response to additional BMPs at a statistically significant level.**

Staff looks forward to collaborating with interested parties to design and implement a robust water quality monitoring plan for Richardson Bay. However, staff disagrees with the suggestion that we should hold off conducting any further monitoring until all control measures are implemented, because the stated objectives of the proposed monitoring plan are to:

- Assess attainment of TMDL targets
- Evaluate spatial and temporal water quality trends in the Bay
- Obtain additional information about significant potential pathogen source areas
- Collect sufficient data to prioritize implementation efforts and assess the effectiveness of source control actions

To achieve these objectives, ongoing water quality monitoring is needed. Further, due to the lack of adequate wet-weather monitoring data, the pathogen contributions from the stormwater and sanitary sewer overflow sources are not currently well characterized. A monitoring program that, among other things, focuses on measuring the contributions from these sources should be conducted as soon as possible.

**Comment Letter no. 6: Pelican Harbour, Sara Flynn; March 21, 2008**

**Comment 6.1: "The report makes no attempt to evaluate the current status of pump out facilities in Richardson Bay. The report does generalize as to the conditions at the marinas and makes general recommendations for change but no where does it state that many marinas have already made significant updates to their pump out systems."**

To evaluate the status of pump-out facilities in Richardson Bay, the staff report relies on a recent report called "Recommendations for Vessels Wastewater Disposal for Region 2 Marina and Harbors..." completed by the California Department of Boating and Waterways in August 2004. Given that the Richardson Bay pathogens TMDL project was started in 2006, less than two years from the time this report was completed, staff decided that the finding of this survey was current enough.

**Comment 6.2: "In 2001, as part of a major renovation of all of the marina's systems, Pelican Harbor installed new pump out, a SaniSailor; Marine Pump-out System. There are hook ups at every other berth and service is available to every single berth in the marina. It is free and available 24 hours a day. It is routinely maintained and is used daily by the tenants at Pelican Harbor. Additionally, every tenant has signed a Berthing Lease Agreement and addendum specifically stating that they will not discharge sewage into the Bay. Copies of both of these documents are attached. We recently sent out a notice reminding tenants that there is no discharge allowed into the Bay with instructions on the use of the pump out system. This is attached as well. Pelican harbour also has toilets and showers on site as well as a laundry area available 24 hours a day. "**

Comment noted. Staff commends you for taking proactive measures to address potential sewage discharge issues in your marina.

**Comment 6.3: "The report underestimates the effects of marine wildlife. The report states several times that exact numbers are difficult to obtain and yet still concludes that wildlife is not a contributing factor."**

Staff disagrees. The staff report does not conclude that "wildlife is not a contributing factor." What the report states in regard to wildlife contribution is as follows:

A variety of terrestrial wildlife, such as birds and rodents that inhabit the open space lands adjacent to the Bay, may contribute pathogens to the Bay through stormwater runoff. No accurate information as to the magnitude and geographic dispersion of this waste source is available.

Marine birds and mammals are also present in the Bay. ... Because of the great variety, complex distribution and dispersal patterns, and fluctuating populations of water birds it is very difficult to assess their impact on water quality in the Bay. They have a potential for localized,

intermittent impact, especially during the winter months. As with avian populations, marine mammals follow the herring runs into the Bay, and may also cause intermittent impacts on water quality in some areas in winter.

While localized problems may be present in certain areas of the Bay where wildlife densities are particularly high, only low fecal coliform levels have been observed at the control sampling station that is not heavily affected by human activities (control station C). This suggests that wildlife (the only other potential source) is not, in general, a significant pathogen source in the Bay. However, based on the available data, wildlife contribution cannot be fully characterized at this point. Since the wildlife source category is not readily controllable, it will not be addressed in the implementation plan.

**Comment 6.4: “As stated in the report in Section 5.6 Wildlife (page 32); ‘while local problems may be present in certain areas of the Bay where wildlife densities are particularly high, only low fecal coliform levels have been observed at the control sampling station that is not affected by human activities (control station C).’ This location that has been chosen to monitor and to highlight, Control Station C, is in an area in the middle of Richardson Bay with much tidal activity and no nearby haul out area for marine mammals. “**

Staff believes that the commenter is referring to section 6.6 of the staff report rather than section 5.6.

The locations of existing control stations were selected such that they represent the quality of water in those areas of the Bay that are not under direct influence of human activities (e.g., vessel marinas, houseboat marinas, stormwater drains, etc.). Unfortunately, the main haul out areas for marine mammals and birds, in most instances, are at or near other potential sources of pathogens. Therefore, it would be very difficult to try to distinguish the impact of these wildlife on water quality from those of the other nearby sources by conducting monitoring at the wildlife haul out locations.

The water quality data from control stations are only used to conclude that wildlife impact on water quality is not of Bay-wide significance. However, as quoted below, the staff report does recognize that despite the low pathogen-indicator levels observed at the control stations, wildlife may have the potential for impacting the water quality on a localized, intermittent basis.

Because of the great variety, complex distribution and dispersal patterns, and fluctuating populations of water birds it is very difficult to assess their impact on water quality in the Bay. They have a potential for localized, intermittent impact, especially during the winter months. As with avian populations, marine mammals follow the herring runs into the Bay, and

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may also cause intermittent impacts on water quality in some areas in winter.

**Comment 6.5: “The report dismisses the wildlife impact on Station B due to its proximity to the marinas and its supposed distance from the wildlife. I would argue that it is the other way around; Location B is more impacted by wildlife than Location C due to it being close to many popular haul out opportunities for marine mammals. And further that, Pelican Barbour is at the center of the “local problems” stated in the report.”**

Staff agrees with commenter’s argument that the fact that control station “B” shows more exceedances of water quality objectives than control station “C,” may, among other factors, be due to its proximity to a popular haul out location for marine mammals and birds. The staff report has been revised as follows:

Among the control sites, control station B, located somewhat closer to the recreational boat marinas and a wildlife haul out area, shows some exceedances of the shellfish objective. Control station C, which is a good representative of open waters away from any pollution sources, exceeds the shellfish WQO only once.

**Comment 6.6: “All three of the marinas listed in the report that tested high for fecal matter also have the highest number of nearby wildlife inhabitants.”**

There are marinas such as Clipper Basin #3 marina that are near high numbers of wildlife inhabitants, yet they have lower exceedances of water quality objectives. As we have stated above, correlations between wildlife sources and exceedances of water quality objectives are inconclusive.

**Comment 6.7: “Our marine mammal neighbors include harbor seals that reside year round on the various floats right next to our Harbour. The colony of seals can number as many as 18 permanent residents. This, in addition to the regular population of cormorants, seas gulls & numerous smaller marine birds. Sea otters have even been spotted in Pelican Harbour, a sign of a healthy marina and Bay. Please note the attached photos of our year round marine neighbors. “**

Comment noted.

**Comment 6.8: “Seasonally, we have sea lions and pelicans. In the winter during the herring season especially, literally thousands of marine birds of all types and sizes and countless numbers of marine mammals descend into Pelican Harbour and the area adjacent from Clipper Yacht Harbor to the north and Sausalito Yacht Harbor in the south.”**

Comment noted.

**Comment 6.9: “More specific sampling of the wildlife impact is needed in order to accurately account for the amount of fecal matter emitted by the marine mammals before its “load allocation” can be determined for future monitoring.”**

As explained in response to comment 6.4 above, measuring wildlife impact on water quality in an area with such mixed potential pathogen sources, such as the western shoreline of Richardson Bay, is very difficult and perhaps impractical. Further, since pathogen-indicator contributions from the wildlife source category are not controllable. As such, staff asserts that it would be most beneficial to the water quality in the Bay to direct available resources to implementation of pathogens control measures for controllable sources rather than determine the exact contribution from wildlife.

**Comment 6.10: “The report is lacking in site observations at the time the samples are taken. It would be helpful in the future if site observations were made at the time of sampling. Current and recent weather conditions and the types and number of marine animals are two suggestions.”**

We can take this into consideration for future monitoring efforts.

**Comment 6.11: “The report underestimates the impact of terrestrial wildlife.”**

Please see response to comments 6.3 above.

**Comment 6.12: “We have a colony of raccoons living under the docks. They roam the docks night and even swim around the harbor in the early evening and early morning. We have made every effort to get rid of these animals but the only viable option has been to learn to co-exist with them. When the raccoons do leave dropping on the docks, the harbormaster no longer sweeps them into the Bay; she disposes of them into the trash.”**

Comment noted.

**Comment 6.13: “Dog run at the end of Pine Street. As stated in section 5.3 Urban Runoff (page 27); ‘Dog waste are readily observed near many of the sampling Stations along Richardson Bay shoreline and are a potential source of pathogen loading to the Bay’ One such site is located within 20 feet of the Pelican Harbour. The rocky beach area at the foot of Pine Street is used almost exclusively by dog owners and few of whom clean up after their dog when they poop in the rocks. All of this waste is washed out into the Bay through Pelican Harbour with each high tide. Additionally, dog owners often walk their dogs on our docks as well and kick any doggy droppings**

**directly into the Bay instead of disposing of it in the trash. Our tenants have been notified that this practice is no longer permitted. “**

Comment noted. As proposed in the staff report and the Basin Plan amendment, additional education and outreach activities for pet owners are needed to ensure that they do an adequate job of cleaning up after their pets.

**Comment 6.14: “The report does not address municipal runoff. There are 3 storm drains nearby to Pelican Harbour. Two of these storm drains flow directly into Pelican Harbour. One is located at 501 Humboldt Street and the second is between B & C Docks at Sausalito Yacht harbor just south of Pelican. “**

The staff report does address stormwater (municipal) runoff. In fact, stormwater runoff is identified as one of the four controllable sources of pathogens in the watershed and it is included in the TMDL and implementation plan.

**Comment 6.15: “Lack of sampling data in the historical shellfish beds.”**

Please see response to comment 2.3 above.

**Comment 6.16: “Lack of sampling at the Mill Valley sewage treatment plant. The number of sanitary sewer overflows is listed in the report but none of the samples are from that area of Richardson Bay. After the release of approximately 5 million gallons of nearly raw and untreated sewage in late January 2008, (see attach article from the Marin Independent Journal) this would seem to be one of the biggest sources of fecal matter in Richardson Bay. If it is not considered a significant source then that should be addressed in the report as well. “**

The illegal discharge into Richardson Bay will be addressed outside of this TMDL, likely through some kind of enforcement action and through the individual NPDES permit issued to the facility.

**Comment 6.17: “Lack of discussion of the main purpose of the report; the restoration of the historic shellfish beds. Who are the 20 organizations -government, not-for profit, and volunteer interested in this project? What is the ultimate goal? Is it a commercial shellfish industry? Is it historical? Is it educational? In order to create a cooperative environment, I would suggest that this section of the report be more detailed. Without knowing the goals and purpose of the restoration it is difficult to create a groundswell of support for the stricter Water Quality for shellfish harvesting versus the Water Quality for water contact for recreation. “**

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The main purpose of the report is not “the restoration of the historic shellfish beds,” as the commenter asserts. The project objectives are clearly stated in section 3.3 of the staff report and do not include historic shellfish bed restoration.

**Comment 6.18: “clearly there is something more going at Pelican Harbour than simply recreational boaters discharging raw sewage into the Bay. If this was happening on a regular basis it would be noticeable to the harbormaster and to the boat owners. I urge you to assist us in examining this situation more closely and to gather more specific data, before imposing a new regulatory system on us. ”**

Staff agrees that exceedances of water quality objectives at Pelican Harbor may be due to more factors than just waste discharges from vessels. However, the best and most effective way to evaluate whether or not your marina is contributing any pathogens to the Bay is, as proposed in the staff report, to conduct a direct evaluation of the adequacy and integrity of Pelican Harbor’s sewage handling systems and those of the vessels berthed in it. Richardson Bay is designated a “no vessel waste discharge area,” and the implementation actions identified in the TMDL stem from this prohibition. All vessel marina owners should already be taking the necessary steps to make sure no vessel waste is discharged from their marinas into the Bay. From comment 6.2 above, it appears that Pelican Harbor is well on its way to complying with the proposed implementation actions for the vessels source category.

**Comment 6.19: “There must be a way to distinguish between the sources that the marinas can control; the vessels and our own sewer systems and the sources over which we have no control; the marine mammals, birds, raccoons, dog walkers, the City of Sausalito storm drains etc. Without more detailed information, how are we to implement site-specific management measures to reduce our pathogen contributions?”**

As stated in Section 9.4 of the staff report,

The Water Board will not hold discharging entities responsible for uncontrollable coliform discharges originating from wildlife/natural background sources. If pathogen indicator contributions from wildlife/natural background are determined to be the primary cause of water quality objectives exceedances, the attainability/applicability of water quality objectives will be evaluated as part of the adaptive implementation program.

Further, as also stated in Section 9.4 of the staff report, the evaluation of compliance with the TMDL requirements will be based on documented implementation actions taken by each source, not based on water quality data alone.

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It should be fairly easy for marina owners to determine which “site-specific management measures” to implement since the staff report contains possible control measures.

**Comment 6.20: “All of us, marina owners, employees and tenants have a vested interest in keeping the Bay healthy, beautiful and safe. Since taking over the management of Pelican Harbour, I have noticed with satisfaction, the dramatic increase in the amount of marine wildlife within the marina and in the waters adjacent to the marina. I take this as an encouraging sign that the San Francisco Bay is healthier and that a clean Pelican Harbour is an attractive spot for these animals to set up residence.”**

Comment noted.

**Comment Letter no. 7: San Francisco Baykeeper, Sejal Choksi and Amy Chastain; March 24, 2008**

**Comment 7.1: “On behalf of San Francisco Baykeeper (“Baykeeper”) and our thousands of Bay Area members, we are writing to provide comments on the Total Maximum Daily Load (“TMDL”) for Pathogens in Richardson Bay. Richardson Bay encompasses some of the most important habitat in the San Francisco region. It contains the second largest extant eelgrass bed in the San Francisco Bay Area and is the site of current important eelgrass bed restoration efforts. The Bay is also integral to annual winter herring runs, the last commercial fishery in the Bay, and to thousands of local and migrating birds, including the endangered California clapper rail. With its relatively protected waters, Richardson Bay is also the location of native oyster restoration and is a popular destination for swimming, kayaking, and rowing.”**

Comment noted.

**Comment 7.2: “As recognized by this TMDL, sewage discharges from houseboats, recreational vessels, storm drains, and sanitary sewer systems have and continue to compromise the designated beneficial uses of Richardson Bay. In addition to pathogenic microorganisms that make shellfish consumption and water contact recreation unsafe, sewage contains a variety of other pollutants that threaten the health of the Richardson Bay ecosystem. These pollutants include nutrients which can contribute to depressed dissolved oxygen levels, and metals and pesticides, which can have sub-lethal but still significant impacts on all aquatic life. While fecal coliform bacteria are the focus of this TMDL, successful implementation should reduce loading of many other harmful pollutants also associated with untreated sewage.”**

Comment noted.

**Comment 7.3: “In general, we support adoption of this Basin Plan Amendment, which is necessary to protect Richardson Bay from the harmful impacts of sewage discharges.”**

Comment noted.

**Comment 7.4: “However, we ask that the following changes be made to the Basin Plan Amendment prior to being considered by the Regional Board for adoption:**

- **Impose additional implementation measures on sanitary sewer system owners in southern Marin, and**
- **Divide the wasteload allocation for stormwater agencies into dry and wet weather allocations and translate the allocations into numeric permit limits, as has been done by other Regional Boards in California.”**

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Please see response to comments 7.7, 7.9 and 7.10 below.

**Comment 7.5: “Apart from these [above] changes, Baykeeper supports the Regional Board’s approach, and especially the use of the water quality objective for shellfish harvesting as the TMDL. Shellfish harvesting is one of the designated beneficial uses of Richardson Bay and, therefore, the TMDL must be sufficiently stringent to protect that use. Establishing the TMDL at the same level (14 MPN/100 mL) as the water quality objective is the best way to ensure that Richardson Bay will eventually support all designated uses as required by the Clean Water Act. ”**

Comment noted.

**Comment 7.6: “We also thank Regional Board staff for including in the Basin Plan Amendment a table of implementation measures. Our comments on previous TMDLs have largely focused on the lack of detail with respect to implementation. Although our comments today still request changes to the implementation measures, the table provided in the Basin Plan represents progress and is something that we hope to see in future TMDLs.”**

Comment noted.

**Comment 7.7: “A. Additional Implementation Measures for Sanitary Sewer Systems are Necessary. The TMDL must specify implementation measures for sanitary sewer agencies in southern Marin County that go beyond mere compliance with existing regulations. Many, if not all, of the sewage treatment plants and collection systems in southern Marin are in poor condition and/or lack the capacity to treat wet weather flows. In January of this year, the Sewerage Agency of Southern Marin (“SASM”) made many newspapers’ headlines when the agency allowed more than 2.5 million gallons of raw and partially treated sewage to flow into the shallow waters of Richardson Bay on two separate occasions.**

**In addition to these very large spills from the treatment plant, the southern Marin collection systems experienced an estimated 150 sewage spills in less than three years, which resulted in at least 50,000 gallons of raw sewage flowing to nearby surface waters, including Richardson Bay. Not only is this spill rate unacceptably high and indicative of the dire condition of southern Marin’s wastewater infrastructure, it is likely an underestimate of the actual number and volume of spills. EPA’s inspections of the sanitary sewer system collection systems in southern Marin identified problems in tracking and reporting sewage spills, and Baykeeper’s own experience in reviewing city records shows that cities often experience many more sewage spills than they report to the Regional Board.**

The TMDL's sole requirement relating to these aged collection systems—that they comply with the Statewide General Waste Discharge Requirements (“WDR”) for Sanitary Sewer Systems—is wholly inadequate in light of Marin’s clearly documented sewage infrastructure problems and Richardson Bay’s impairment. All TMDLs must provide “reasonable assurances” that they can and will be implemented in a manner that results in timely attainment of water quality standards. Reasonable assurances must include an “actual demonstration that the measures identified will result in the predicted reductions and that the State is able to assure this result.” The Statewide General Permit, which attempts to ensure that sanitary sewer agencies keep their collection systems in good working order, has been in effect for almost two years but has not prevented or remedied the failing conditions of the Marin sewer systems. In the absence of enforcement or additional regulation, the Marin sanitary agencies will continue to have numerous sewage spills that will cause and contribute to water quality violations in Richardson Bay.

In order to provide the necessary “reasonable assurances,” Baykeeper strongly recommends amending the draft TMDL to identify trackable implementation measures—beyond mere compliance with the General WDR—for reducing sewage spills from the sanitary sewer treatment plants and collection systems in southern Marin. These measures should address the issues identified by EPA’s recent inspections of five of the six sewage collection systems that flow to the SASM wastewater facility. The issues identified by those reports that this Regional Board should address include the following:

- **Inflow and Infiltration Studies.** It is believed that inflow and infiltration (I & I) contributes significantly to treatment plant capacity issues and high spill rates, but the actual I & I rates are unknown. Moreover, the rate agreements between the agencies owning the treatment plants and those owning the collection systems provides no incentive for reduction of I & I in the collection systems.
- **Spill Response and Containment.** Many of the agencies responsible for maintaining the sewage collection system have no ability to respond to or contain sewage spills. As revealed in the EPA inspections reports, they rely on Roto-Rooter for response, but the Roto-Rooter office is often twenty or more miles away. Additionally, many Marin cities have unwritten agreements with Roto-Rooter and it is unclear whether the company’s response and containment is adequate.
- **Inadequate Spill Tracking and Reporting.** The EPA inspections confirmed what Baykeeper already knows from experience reviewing city records: many agencies that operate collection systems have inadequate spill tracking and reporting procedures and, therefore, are underreporting spills. “

Additionally, the Marin agencies should be required to establish a forum for information sharing, discussion and dispute resolution per the recommendation of a 2004 Marin Grand Jury Report entitled “Southern Marin Sewers— So Many Districts, So Few Users.”

This report concluded that the relationships between the agencies responsible for the treatment plants and those responsible for the collection systems creates an institutional barrier to reducing inflow and infiltration and, therefore, spills. The Grand Jury found that “with no overriding mandate to confer and collaborate, it is easy [for the collection agencies] to opt to conduct business as usual.” The report recommends the creation of a joint powers agreement to enable the eleven agencies serving the area to share personnel, expertise, and physical resources. “

**Recommendation:** Baykeeper recommends that the Basin Plan Amendment be revised to include trackable implementation measures and deadlines addressing each of the issues identified above, including but not limited to:

- Characterization of I & I to the collection systems;
- Acquisition of spill response equipment and development of formal response and containment procedures;
- Development and implementation of accurate spill reporting procedures;
- Comprehensive evaluations of the agencies’ Capacity, Management, Operation, and Maintenance (“CMOM”) programs; and
- Creation of a joint powers agreement or some other arrangement to facilitate communication, information sharing and dispute resolution amongst the agencies.”

All five measures that the commenter has recommended to be added to the Basin Plan amendment are addressed under the U.S. EPA’s April 2008 Administrative Orders (USEPA, 2008a; USEPA, 2008b) to nearly all the southern Marin County sewage collection agencies. There are just two exceptions that are identified and addressed below.

The two exceptions mentioned above are:

1. U.S. EPA did not require the creation of a joint powers agreement. However, it did require a study evaluating options for collaboration among member agencies. Like the U.S. EPA, the Water Board does not have the authority to require a joint powers agreement or other formal arrangement between these separate agencies. However, Water Board staff support and encourage the creation of such agreements between the sewage agencies.
2. The Sanitary District No. 5 was not included in U.S. EPA's Administrative Orders. However, the General Waste Discharge Requirements (WDR) for Collection System

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Agencies (Order No. 2006-0003 DWQ) already requires Sanitary District No. 5 to perform the measures recommended by the commenter. Specifically, the General WDR requires Sanitary District No. 5 to develop and implement plans to eliminate hydraulic capacity deficiencies, to appropriately respond to spills in a way that protects public health and the environment, to accurately report spills, and to properly maintain and operate its system. Additionally, the Sanitary District No. 5's NPDES permit hearing scheduled for the July 2008 Board meeting includes a provision that would require implementation of 3.5 million dollars in capital improvements for sewer system rehabilitation over the next 10 years to reduce wet weather I&I (at VI.C.6).

Therefore, given the above, the recommended requirements are already in place and do not need to be duplicated in the Basin Plan amendment. The Staff Report, section 9.3, has been amended to include a discussion of the U.S. EPA enforcement orders.

**Comment 7.8: "As a preliminary matter, we note that Table 7-3 ("Density-Based Pollutant Wasteload and Load Allocations for Richardson Bay") of the Basin Plan is confusing and requires some clarification. This table specifies an allocation for "Stormwater Runoff" but it is unclear whether this is a wasteload allocation ("WLA") for discharges from municipal separate storm sewer systems ("MS4s") or a load allocation for nonpoint source runoff. Assuming that it is the former, this WLA should be clearly designated as such."**

The specified allocation for the stormwater runoff in Table 7-3 is in fact a wasteload allocation for the discharges from "municipal separate storm sewer systems." Table 7-3 has been revised to clarify this point as follows:

<b>Table 7.3 Density-Based Pollutant Wasteload and Load Allocations <sup>a</sup> for Richardson Bay</b>		
<b>Categorical Pollutant Source</b>	<b>Wasteload and Load Allocations Fecal Coliform (MPN/100 mL)</b>	
	<b>For Direct Discharges to the Bay</b>	
	<b>Median <sub>b</sub></b>	<b>90<sup>th</sup> Percentile<sup>c</sup></b>
<b>Stormwater Runoff <sub>d</sub></b>	<14	< 43
<b>Wildlife <sup>e</sup></b>	<14	< 43
<b>Sanitary Sewer Systems</b>	0	0
<b>Houseboats</b>	0	0
<b>Vessels (Recreational, Live-aboard, Anchor-out Boats)</b>	0	0
<p>a. These allocations are applicable year-round. <del>Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.</del></p> <p>b. Based on a minimum of five consecutive samples equally spaced over a 30-day period.</p> <p>c. No more than 10% of total samples during any 30-day period may exceed this number.</p> <p>d. <u>Wasteload allocation for discharges from municipal separate storm sewer systems (NPDES Permit Nos. CAS000004 and CAS000003).</u></p> <p>e. Wildlife is not believed to be a significant or readily controllable source of pathogens; therefore, no management measures will be required.</p>		

**Comment 7.9: “In addition to clarifying the meaning of “Stormwater Runoff,” the TMDL provisions related to stormwater require two changes. First, the TMDL should establish WLAs for MS4s during the wet and dry season. During the rainy season, stormwater flows may carry animal feces and other sources of fecal indicator bacteria into MS4s. During the dry season, however, MS4s should not be a source of fecal indicator bacteria as they should not be discharging to Richardson Bay at all.”**

Separating the wasteload allocation for the stormwater into dry and wet seasons is not necessary. As it is, the proposed wasteload allocation for stormwater source category allows for zero exceedances of “shellfish” bacterial water quality targets during either dry or wet season. This requirement is sufficiently stringent to ensure not only protection of the shellfish harvesting beneficial use but also that of the water contact recreation use during all seasons, regardless of the presence or absence of any stormwater discharges.

**Comment 7.10: “Second, the trackable implementation measures for MS4s should include numeric effluent limits. In southern California, the Los Angeles Regional Board used numeric effluent limits to implement dry weather WLAs for Santa Monica**

**Bay beaches. Their rationale for this approach—that dry weather WLAs do not apply to storm water and that the iterative approach in previous permits has failed to eliminate dry weather discharges—applies equally here.”**

At this time establishment of numeric effluent limits for MS4 discharges in Richardson Bay is not necessary. Various discharge permits and Basin Plan waste discharge prohibitions provide adequate tools for the Water Board to enforce against any illicit human waste discharges that may be carried into the Bay through the stormwater system.

It is also staff’s understanding that the Los Angeles MS4 permit was amended to implement the summer dry weather TMDL requirements. Those requirements included a receiving water limitation for fecal indicator bacteria and a supporting specific prohibition on discharges from the MS4 that cause or contribute to exceedances of recreational contact water quality objectives for bacteria. These requirements were established to protect the millions of beach users during the dry season (April to October) when storm events do not occur yet discharges were occurring from stormwater outfalls. The circumstances surrounding the Los Angeles MS4 permit are clearly different than Richardson Bay, as sampling conducted at Schoonmaker Beach, the only beach in Richardson Bay, does not indicate impairment for recreational uses.

**Comment 7.11: “Recommendation: Baykeeper recommends a clarification of the definition of “Stormwater Runoff.” We also request that the stormwater runoff WLA be divided into wet and dry season allocations with numeric limits to implement the dry weather allocation. “**

Staff disagrees with Baykeeper’s recommendation based on the responses provided above to comments 7.9-10.

**Comment 7.12: “C. The Houseboat and Vessel Implementation Measures Should Contain More Detail. We strongly support the requirement that the county and local cities evaluate the adequacy and performance of sewage systems for all houseboats and vessels. We urge the Regional Board to be more specific, however, about what this requirement entails.**

**Recommendation: Baykeeper recommends that the trackable implementation measures include annual (or some specified frequency) inspections for each houseboat and vessel, establishment of authority by the cities and by marina operators to inspect houseboats and vessels and enforce against those that are substandard, and establishment of an anonymous hotline for citizens to report violations.”**

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Staff agrees with the recommendation to specify an inspection frequency for the houseboats and vessels and has revised the TMDL documents to include a biannual inspection frequency for them. Water Board staff intend on working with local governmental entities to implement the actions required in the TMDL, based on existing authorities. Staff will work with the local entities to explore developing those authorities, where necessary.

Lastly, as for establishing a hotline for citizens to report violations, the public can contact the Richardson Bay Harbor Administrator to report an illegal discharge.

### **Comment 7.13: “D. The Basin Plan Amendment Should Require Water Quality Monitoring and Beach Closures When Water Quality Standards are exceeded.**

**While the monitoring data summarized in the TMDL staff report contains data for Schoonmaker Beach, it is unclear whether the Marin County Department of Health or other agency regularly monitors fecal coliform levels at beaches or other locations where water contact recreation is likely. The Earth911 website, a clearinghouse for information on beach water quality, does not include any data for Marin bayside beaches.**

**Recommendation: In order to protect human health, the Basin Plan should require regular fecal indicator bacteria monitoring at Schoonmaker Beach and other water contact recreation areas and immediate closures of these areas when water quality objectives are exceeded. “**

The Marin County Environmental Health Services Division is and has been conducting weekly water quality monitoring and warning/closure postings at Schoonmaker and other public beaches in the County for several years. Therefore, staff does not see a need for requiring additional water quality monitoring at these sites.

**Comment 7.14: “In conclusion, Baykeeper supports adoption of this TMDL provided that it is first revised to (1) impose additional implementation measures for sanitary sewer systems as necessary to address identified problems with those systems, (2) establish dry and wet weather WLAs for municipal stormwater, (3) specify that municipal stormwater WLAs will be implemented via numeric effluent limits as has been done in other parts of California, (4) provide more detail regarding vessel and houseboat implementation measures, and (5) require beach monitoring and immediate public notification when water quality standards are exceeded.”**

Please see response to comments above.

**Comment Letter no. 8: Sausalito-Marín City Sanitary District, Robert Simmons; March 21, 2008**

Comment 8.1: In particular, we believe Footnote "a." on Table 7-3 may lead to future confusion and should be revised. It states, in part, "Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit." The apparent intent of the footnote is to address existing or new sources in the listed pollutant categories. However, the breadth of the statement will lead to future confusion related to source categories not listed in Table 7-3. Since the TMDL by its nature will cover all new or newly discovered sources in the affected source categories, it is redundant and confusing to include the sentence in the footnote. We urge deletion of the sentence in question to improve clarity, as follows:

Table 7-3 of the Basin Plan Amendment has been revised, as follows, and as a result, the statement in Footnote "a" has been deleted.

<b>Table 7-3. Density-Based Pollutant Wasteload and Load Allocations<sup>a</sup> for Richardson Bay</b>		
<b>Categorical Pollutant Source</b>	<b>Wasteload and Load Allocations Fecal Coliform (MPN/100 mL)</b>	
	<b>For Direct Discharges to the Bay</b>	
	<b>Median<sup>b</sup></b>	<b>90<sup>th</sup> Percentile<sup>c</sup></b>
<b>Stormwater Runoff<sup>d</sup></b>	<14	< 43
<b>Wildlife<sup>e</sup></b>	<14	< 43
<b>Sanitary Sewer Systems</b>	0	0
<b>Houseboats</b>	0	0
<b>Vessels (Recreational, Live-aboard, Anchor-out Boats)</b>	0	0
<p>a. These allocations are applicable year-round. <del>Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.</del></p> <p>b. Based on a minimum of five consecutive samples equally spaced over a 30-day period.</p> <p>c. No more than 10% of total samples during any 30-day period may exceed this number.</p> <p>d. <u>Wasteload allocation for discharges from municipal separate storm sewer systems (NPDES Nos. CAS000004 and CAS000003).</u></p> <p>e. Wildlife is not believed to be a significant or readily controllable source of pathogens; therefore, no management measures are required.</p>		

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**Comment 8.2: We support the Water Board's efforts to reduce pathogens in Richardson Bay, as evidenced by our continuing commitment to compliance With the Statewide Waste Discharge Requirements for Sanitary Sewer Systems. We applaud Regional Board staff's efforts in developing a comprehensive plan that is environmentally protective.**

Comment noted.

**Comment Letter no. 9: Sausalito yacht harbor, Jim Madden; March 20, 2008**

**Comment 9.1: "Table 7-3 topic "d." states that wildlife is not believed to be a significant or readily controllable source of pathogens therefore no management measures are required. This appears to be a very high level statement without any statistically valid proof provided to support such a broad statement in the report. I agree that it is not a readily controllable source of pathogens however I disagree with the statement that it is not a significant source of pathogens.**

In general, while wildlife has the potential to discharge pathogens into the Bay, its impact on human health is far less significant than the pathogens discharged from human sources (e.g., vessel sewage, sanitary sewer systems, etc.). This is so, because human waste has the potential to contain a much bigger variety of pathogens, especially human viruses, which we as humans are much more vulnerable to than those found in wildlife waste.

Further, the statement that "wildlife is not believed to be a significant ...source of pathogens," is meant to indicate that wildlife impact on water quality is not of Bay-wide significance. However, as quoted below, the staff report does recognize that despite the low pathogen-indicator levels observed at the control stations, wildlife may have the potential for impacting the water quality at some locations.

Because of the great variety, complex distribution and dispersal patterns, and fluctuating populations of water birds it is very difficult to assess their impact on water quality in the Bay. They have a potential for localized, intermittent impact, especially during the winter months. As with avian populations, marine mammals follow the herring runs into the Bay, and may also cause intermittent impacts on water quality in some areas in winter.

**Comment 9.2: "In the study conducted only marinas were statistically measured. The traditional shellfish harvesting areas have not been measured for pathogen levels. I have a hypothesis that if the traditional shellfish harvesting areas were to be measured they would probably meet the shellfish harvesting standard now. "**

Please see response to comment 2.3 above.

**Comment 9.3: "Traditional shellfish harvesting areas have different forms of animal life than do the marinas. The marinas, contrary to popular belief, actually encourage and have very high levels of animal life. If there are higher levels of animal life in and around the marinas than there are in the shellfish harvesting areas it would account for higher levels of pathogens. "**

Comment noted.

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**Comment 9.4: “In support of this hypothesis I submit photos of extensive bird and seal populations lounging in and around the marinas. You will note in the pictures with the birds that there are extensive white areas on the docks which are direct evidence of the birds contributing to a higher pathogen count. Additionally, the marinas in Sausalito have a high raccoon population which roam the marinas at night and also contributes to the higher pathogen levels. I have a picture of the deposits left by raccoons. These three large populations of seals, birds and raccoons are in fact a significant contributing source of pathogens. They are also clearly out of the control of marinas. “**

As stated in Section 9.4 of the staff report,

The Water Board will not hold discharging entities responsible for uncontrollable coliform discharges originating from wildlife/natural background sources. If pathogen indicator contributions from wildlife/natural background are determined to be the primary cause of water quality objectives exceedances, the attainability/applicability of water quality objectives will be evaluated as part of the adaptive implementation program.

**Comment 9.5: “Another blanket statement in the report is that ‘Bacteria levels are low at monitoring sites that contain wildlife but are minimally impacted by human activities. This suggests that wildlife may not be a significant, widespread potential source of pathogens in Richardson Bay.’ “**

The staff report statement quoted by the commenter is accurate, as monitoring results from various studies, summarized in Section 4 of the staff report, have shown that not all areas of Richardson Bay have elevated pathogen-indicator levels.

**Comment 9.6: “If you look at the pictures of the large seal population well over a hundred animals they are all lounging in and around the marina. If you look at the pictures with seals you will note that you will not see any seals farther out into Richardson Bay where control stations "B" and "C" are located. Control station "B" is closer to the seal population than is control station "C". Control station "B" has a higher tidal flow than does the marina. The seal population is closer to the marina than it is to Control station "B". Control station "B" consistently has higher pathogen levels than does control station "C" which lends credence to the theory that the animal populations indeed do have an impact upon the pathogen levels. Control station "C" is farther out in Richardson Bay where there is a very strong tidal action and no lounging bird, seal, or raccoon populations which contribute to higher pathogen levels. Control "C" consistently has the lowest readings due to greater tidal action and lower lounging seal, bird, and raccoon populations. The marinas have less tidal action and higher lounging populations of birds, seals, and raccoons all contributing to the pathogen level. “**

Staff agrees that control station "B" is closer to one of the wildlife haul out areas than control station "C". However, control station "B" is also closer to other potential sources of pathogens (e.g., vessels marinas) than control station "C". Unfortunately, the main haul out areas for marine mammals and birds, in most instances, are at or near other potential sources of pathogens. Therefore, it would be very difficult to try to distinguish the impact of this wildlife on water quality from that of the other nearby sources.

Staff agrees with commenter's argument that the fact that control station "B" shows more exceedances of water quality objectives than control station "C," may, among other factors, be due to its proximity to a popular haul out location for marine mammals and birds. Accordingly, staff report has been revised as follows:

Among the control sites, control station B, located somewhat closer to the recreational boat marinas and a wildlife haul out area, shows some exceedances of the shellfish objective. Control station C, which is a good representative of open waters away from any pollution sources, exceeds the shellfish WQO only once.

While staff agrees that high populations of wildlife could contribute to pathogen-indicators and potentially to pathogens levels, not all areas of the Bay that are in the proximity of high wildlife populations exhibit large exceedances of water quality objectives. In staff's opinion, Clipper Basin #3 and #4 marinas are the marinas that are near the largest number of wildlife population. Yet these marinas experience lower exceedances of water quality objectives than the two marinas with the highest exceedances, Sausalito Yacht Harbor and Pelican Harbor.

**Comment 9.7: "The traditional shellfish harvesting areas have not been tested at all. I maintain that you can't make a final decision on the pathogen levels until you actually test the areas that you are trying to save. If you make a decision on pathogen levels while only testing the marinas and not testing the traditional shellfish harvesting areas it is a clear bias against marinas. "**

Please see response to comment 2.3 above.

**Comment 9.8: "I would go as far to suggest that it is designed to indirectly put marinas out of business and has nothing to do with protecting shellfish since the shellfish harvesting areas have not been tested at all. "**

Staff disagrees. The TMDL is not meant to put anyone out of business but is instead intended to address water quality impairments. Please see response to comment 2.3 above for more information.

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**Comment 9.9: “If any levels are to be set they should be dual levels. The traditional shellfish harvesting areas of Richardson Bay should have the shellfish harvesting standard and the marinas and the rest of Richardson Bay should be set to the water contact recreation standard numeric target. Prior to setting any standards a proper study needs to be conducted in which all of the areas of Richardson Bay should be tested and analyzed. If you only test one subset of an entire population you quite clearly do not have a statistically valid sample upon which to draw a conclusion. In this case the marinas are the subset of the entire population. “**

Please see response to comment 2.3 above.

**Comment 9.10: “The Sausalito Yacht Harbor has an extensive program already in place. It has two fully operational pump-out facilities which, based upon current use, are adequate for a marina our size. One of the two stations is brand new, having been replaced within the last year. All of the houseboats in the marina are attached to the sewer system. They have all been inspected to ensure that they are connected to the sewer system. Approximately 12% of the boats in the Sausalito Yacht Harbor are on a regular pump out schedule with MT Head. The Sausalito Yacht Harbor strongly encourages its tenants to utilize the services of MT Head as well as the free pump-out facilities which are open 24 hours per day. MT Head is a service which goes to the boats and pumps out the holding tanks of the boats. The Sausalito Yacht Harbor has requested its tenants to turn in any tenant that they observe discharging sewage into the bay. The Sausalito Yacht Harbor has also sent out a letter to all of its tenants describing the above harbor pump-out policy. See attachment "A" for a copy of the letter sent to tenants. Additionally, the Sausalito Yacht Harbor has documented memos on the inspections conducted at each of the houseboats in the marina. See attachment "B" for sample memo written. MT Head provides a periodic report to the Sausalito Yacht Harbor listing the tenants in the marina that are being serviced by MT Head. See attachment "C". Contrary to a popular misconception our customer base is very ecological minded and they do care about the environment. “**

Comment noted. Staff commends the Sausalito Yacht Harbor for taking proactive measures to address potential sewage discharge issues in the marina.

**Comment 9.11: “But despite our diligent efforts at utilizing best practices the marina is still above the shellfish standard, an artificially low standard which can't be met despite our best efforts.”**

Please see response to comment 9.4 above.

**Comment 9.12: “In reviewing the report it was noted that the pathogen levels go through the roof when it rains. The slowest time of year for marinas is during the rainy season. During the summer the pathogen levels are at their lowest. The summer**

season is peak boating season. This is a clear indication that the best practices that the Sausalito Yacht Harbor has embraced are clearly working and that factors outside of our control are the real culprits.”

While staff agrees with the commenter’s argument that, in the wet season, contributions from other sources such as stormwater runoff and sanitary sewer overflows may be the reason for the higher pathogen-indicator levels observed in the Bay, staff disagrees with the commenter’s implication that the threat from potential vessel waste discharges would necessarily be lower in the winter season than in the summer season. After all, one could argue that in the winter time, more boats and live-aboards are berthed at the marinas as opposed to the summer time when they might be sailing away from the marinas. Further, since the water quality objectives are exceeded even during the summer season, staff does not understand the commenter’s conclusion that “the best practices that the Sausalito Yacht Harbor has embraced are clearly working.”

**Comment 9.13: “Another issue that marinas face is that they are at the end of the pathogen creating cycle. Most of the marinas in Sausalito have city owned storm drains draining right into the various marinas. The Sausalito Yacht Harbor has three of them, Clipper Yacht Harbor has at least one, the former Arques area has at least one, and Pelican Yacht Harbor would be directly impacted by at least two of the three storm drains that are located in the Sausalito Yacht Harbor. The marinas are also the ultimate recipients of sanitary sewer systems overflow, urban runoff, and large seal, bird, and raccoon populations. The marinas have absolutely no control over any of the above mentioned factors yet it is obvious that despite utilizing best practices the marinas are clearly going to shoulder all of the blame for merely being at the end of the pathogen creating cycle.”**

Please see response to comment 9.11 above. The collection of additional monitoring data as suggested in the staff report and Basin Plan amendment may help us distinguish one of these sources from the others to ensure that “blame” is cast appropriately.

**Comment 9.14: “For example, a few days prior to the last winter sampling event 2/9/07 a large sanitary sewer overflow incident occurred in the Coyote Creek watershed; the data at the Sausalito Yacht Harbor station #3 jumped to 1200 and station #4 760. I believe that there is a direct relationship between the spike and the sewer overflow. The report states that ‘The relatively sharp jump in the number of wet season exceedances could be attributed to wet-season specific sources such as urban runoff and sanitary sewer overflows.’ believe word “could” substantially understates the direct relationship that exists between sewer spills, urban runoff and spikes in pathogen levels at the various marinas.”**

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Comment noted. Unfortunately, due to the lack of adequate wet season monitoring data, at this point it is not possible to make any definitive conclusions as to what the increase in the number of wet season exceedances could be attributed to.

**Comment 9.15: “By setting the standard to the shellfish level which is an artificially low standard you will be subjecting the marinas, private individuals, the cities, and other government agencies such as Cal Trans to endless lawsuits because a standard has been set which has not been well thought out or properly studied and which can't be met. I have attached a newspaper article (attachment "D") in which the city of Malibu is being sued for not meeting water quality standards which include fecal matter. In the article Baykeeper the litigant declined to suggest how the city could further deal with the issue, saying ‘it is Malibu's responsibility to figure that out.’”**

As stated in Section 9.4 of the staff report quoted below, the evaluation of compliance with the TMDL requirements will be based on documented implementation actions taken by each source.

It is important to note that the numeric targets and load allocations in the TMDL are not directly enforceable. To demonstrate attainment of applicable allocations, responsible parties must demonstrate that they are in compliance with specified implementation measures...or waste discharge prohibitions.

**Comment 9.16: “In conclusion, if any levels are to be set there should be dual levels set. The traditional shellfish harvesting areas of Richardson Bay should have the shellfish harvesting standard and the marinas and the rest of Richardson Bay should be set at the water contact recreation standard numeric target. “**

Shellfish harvesting is a designated beneficial use for the entire Bay and not just for the “traditional” shellfish harvesting areas of the Bay. As such, the shellfish harvesting water quality objectives must be attained and maintained in all areas of the Bay. Water Board staff may review the beneficial use designation as part of its adaptive implementation approach.

**Comment Letter no. 10: United States Environmental Protection Agency, Janet Hashimoto; March 19, 2008**

**Comment 10.1: "Thank you for the opportunity to comment on the proposed Staff Report and Basin Plan Amendment for the Richardson Bay Pathogens Total Maximum Daily Load (TMDL), dated February 2008. We have reviewed the proposed TMDL and Basin Plan Amendment and find that, upon implementation, should effectively protect the beneficial uses of shellfish harvesting and water contact recreation in Richardson Bay. We support the analysis and urge the Regional Board to approve the proposed TMDL and Basin Plan Amendment. We commend you for your work in developing this TMDL and are pleased to provide the following comments."**

Comment noted.

**Comment 10.2: "The proposed Staff Report on page 1 states that the TMDL encompasses and addresses the pathogens impairment in Richardson Bay and at another 303(d)-listed water body, the Schoonmaker Beach. However, we did not find Schoonmaker Beach listed on California's 2006 Clean Water Act 303(d) list. If you will be adding Schoonmaker Beach as impaired to the 2008 303(d) list and addressing it in this TMDL, please clarify this in the Basin Plan Amendment."**

Commenter is correct. Schoonmaker Beach was erroneously documented as an impaired waterbody in the staff report. This reference was deleted from the staff report.

**Comment 10.3: "We support the Board's proposed numeric targets and TMDL for fecal coliform in Richardson Bay to protect the important beneficial use of shellfish harvesting, as well as preserving the beneficial use of water contact recreation. We are particularly supportive of the use of the numeric target (and TMDL) of a median fecal coliform density of less than 14 MPN/100mL, and a 90<sup>th</sup> percentile fecal coliform density of less than 43 MPN/100mL, for the protection of shellfish harvesting. It is very important to ensure that the beneficial use of shellfish harvesting is protected in the Bay, not only because it is an applicable water quality standard, but also because human health is directly affected by it."**

Comment noted. Staff agrees.

**Comment 10.4: "On November 16, 2004, EPA promulgated a rule entitled, "Water Quality Standards for Coastal and Great Lakes Recreation Waters" (69 FR 67217 et seq.) and which can be found at 40 CFR part 131.41. This rule was effective December 16, 2004, and requires marine coastal waters (including estuarine waters) of California (except those covered by Regional Water Quality Control Board 4) to achieve certain bacteria standards. We understand this rule applies to Richardson Bay based on the**

designated body contact recreation beneficial uses in effect. The Staff Report at page 12 states the Water Board also interprets this rule to apply to Richardson Bay.

Under the rule, Designated Bathing Beach Waters must meet an enterococci concentration of no more than 35/100 mL (geometric mean, using analytical methods 1106.1 or 1600 or equivalent method) and a single sample maximum value within a range starting at 104/100 mL (75% confidence level), depending on the frequency of use. These values explicitly apply to enterococci regardless of origin unless a sanitary survey shows that the source of the indicator bacteria are non-human and epidemiological study shows that the indicator densities are not indicative of human health risk.

The proposed Basin Plan Amendment and Staff Report include numeric targets for water contact recreation of a geometric mean enterococci density of less than 35 CFU/100 mL, and a 90<sup>th</sup> percentile enterococci density of less than 104 CFU/100mL. The Staff Report at page 12 states the Water Board finds that ‘The current Basin Plan fecal coliform standards for protecting the beneficial use of shellfish harvesting in the Bay are protective of the federal standards, because the fecal coliform standards for shellfish harvesting protection are roughly an order of magnitude more stringent than the standards set to protect water contact recreation. In other words, the fecal coliform standards are sufficiently stringent to result in attainment of the enterococci standards, and there is no need to establish a separate enterococci TMDL for Richardson Bay.’ We agree with the Water Board’s analysis that the TMDL, if based on the stringent fecal coliform standard for shellfish harvesting, is sufficiently stringent to result in attainment of the federal enterococci standards for water contact recreation.”

Comment noted.

**Comment 10.5:** We support the Water Board's allocations of zero for sanitary sewer systems, houseboats and vessels (recreational, live-aboard, and anchor-out boats). Since human waste can be a direct and significant source of pathogens, any discharge of it can be considered potentially deleterious to human health particularly given the sensitive beneficial uses of the Bay. We also support the stringent fecal coliform waste load allocation for stormwater runoff and allocation for wildlife.

Comment noted.

**Comment 10.6:** “Table 7-3 on page 3 in the proposed Basin Plan Amendment includes wasteload and load allocations. Please include a list of all NPDES permits (stormwater permits) to which wasteload allocations (for stormwater runoff) will apply.

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Table 7.3 of the Basin plan amendment has been revised as follows:

<b>Table 7-3. Density-Based Pollutant Wasteload and Load Allocations<sup>a</sup> for Richardson Bay</b>		
<b>Categorical Pollutant Source</b>	<b>Wasteload and Load Allocations Fecal Coliform (MPN/100 mL)</b>	
	<b>For Direct Discharges to the Bay</b>	
	<b>Median<sup>b</sup></b>	<b>90<sup>th</sup> Percentile<sup>c</sup></b>
<b>Stormwater Runoff<sup>d</sup></b>	<14	< 43
<b>Wildlife<sup>e</sup></b>	<14	< 43
<b>Sanitary Sewer Systems</b>	0	0
<b>Houseboats</b>	0	0
<b>Vessels (Recreational, Live-aboard, Anchor-out Boats)</b>	0	0
<p>a. These allocations are applicable year-round. <del>Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.</del></p> <p>b. Based on a minimum of five consecutive samples equally spaced over a 30-day period.</p> <p>c. No more than 10% of total samples during any 30-day period may exceed this number.</p> <p>d. <u>Wasteload allocation for discharges from municipal separate storm sewer systems (NPDES Permit Nos. CAS000004 and CAs000003).</u></p> <p>e. Wildlife is not believed to be a significant or readily controllable source of pathogens; therefore, no management measures are required.</p>		

**Comment 10.7: “Table 7-3 includes a load allocation of zero for sanitary sewer systems. Table 7-4 on page 5 of the proposed Basin Plan Amendment lists the trackable implementation measures for each source category. For sanitary sewer systems, the implementation measure or action is: Comply with the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems. The proposed Staff Report at section 9.3 on pages 39 and 40 states, ‘The Water Board notified wastewater collection agencies of the requirements for preparing SSMPs [Sewer System Management Plans] in July of 2005; the notification included required completion dates for each SSMP element.’ We recommend that more detail of the SSMPs for each sanitary sewer system for which the TMDL applies be included in the implementation section, in order to show what specific actions will take place and by when, to reduce the likelihood of continued sanitary sewer system overflows into Richardson Bay.”**

Including specific elements of SSMPs in the TMDL is not necessary as they are already required by other mechanisms (please see response to comment 7.7 above). It is also

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more appropriate to specify such details through these other mechanisms as they afford more adaptive implementation flexibility than if memorialized in the Basin Plan amendment.

**Comment 10.8: “Additionally, we encourage the Water Board to include as part of the implementation plan for this TMDL any appropriate additional measures to improve the maintenance of sanitary sewer collection systems and to replace aging sewer pipes in order to prevent sewage overflows that contribute pathogens to the Bay.”**

Please see response to comment 7.7 above.

**Comment 10.9: “Similarly, Table 7-4 of the proposed Basin Plan Amendment lists trackable implementation measures for stormwater runoff. For stormwater agencies, the implementation action is to implement applicable stormwater management plans, update plans as appropriate, and report progress on the plans to the Water Board. We recommend that more detail of the stormwater management plans for each stormwater system for which the TMDL applies be included in the implementation section, in order to show what specific actions will take place to reduce the likelihood of stormwater runoff contributing to pathogens in Richardson Bay.”**

Since the stormwater management plans are subject to update over time, staff feel it is most appropriate to refer specifically to these plans.

**PART II: STAFF RESPONSES TO WRITTEN COMMENTS ON THE  
FEBRUARY 8, 2008 STAFF REPORT AND PROPOSED BASIN PLAN  
AMENDMENT RECEIVED AFTER THE MARCH 24, 2008 CLOSE OF  
COMMENT PERIOD**

Note: This comment letter was submitted after the public comment period ended. Staff recommends that the Board include the letter in the record and has prepared responses to the comments which are included in this section.

**Comment Letter no. 1: Richardson Bay Regional Agency, Charles  
McGlashan; April 17, 2008**

Comment 11.1: "Please accept this letter commenting on the proposed Basin Plan Amendment (or Total Maximum Daily Load (TMDL) plan) for Richardson's Bay. Concerning the timing of this letter, the RBRA Board only meets every two months. Our previous meeting occurred before the release of the draft public comment TMDL, and the meeting date of the letter occurred after the first State Water Resources Control Board (SWRCB) meeting on this topic, but before the SWRCB meeting on potential TMDL adoption. If it were within the constraints of the Richardson's Bay Regional Agency's (RBRA) meeting schedule, we would have submitted this letter by March 24. ... Given the ongoing dialogue between the RBRA and your agency, we trust that these comments will be incorporated into the public record and the SWRCB's deliberations. "

Staff recommends that the letter be included in the public record.

Comment 11.2: "As previously expressed, the RBRA has some serious reservations about the underlying basis for the TMDL, namely that shellfish harvesting in Richardson's Bay was, is, or realistically can be considered a "beneficial use". Non-attainment of water quality standards in support of the shellfish harvest water quality objective is the putative reason for justifying imposition of a TMDL in Richardson's Bay. The RBRA recognizes that Richardson's Bay is listed as a "non-attainment" area for shellfish harvest water quality standards in the San Francisco Bay Basin Plan. However, many parts of San Francisco Bay, for example Oyster Point, have higher pollution levels than Richardson's Bay, and more history of shellfish use. The RBRA is not opposed in concept to a program that supports RBRA's goals and ongoing efforts to clean up Richardson's Bay. However, it should be noted for the record that the shellfish beneficial use appears to be merely an historical artifact, a reminder of by-gone years at/before the turn of the 19th century, when a commercial oyster harvesting industry existed in Richardson's Bay. Richardson Bay's industry was based on non-native Eastern oysters, the young fry of which were imported in boxcars from the East Coast, and which never propagated in Richardson's Bay. That industry and its oysters have been gone from Richardson's Bay for at least 80 years. What occurs

now is a population of native Olympia oysters that previously have not and currently do not have human consumption beneficial use value. At maturity, Olympia oysters are the size of a nickel, unlikely to ever be consumed. Given the lack of any real evidence to support native Olympia oyster shellfish harvesting as a beneficial use, a TMDL based on the shellfish harvest water quality objective is unreasonable and unachievable since it would be based on "potential" (and highly unlikely) future uses, and not "probable" future uses.

Currently, shellfish harvesting is a Basin Plan-designated beneficial use of the entire Bay. As such, the proposed water quality target for shellfish harvesting is needed because TMDLs must be designed to protect all designated beneficial uses of a given waterbody. If in the future, it is determined that the shellfish harvesting beneficial use does not apply, staff may prepare a Basin Plan amendment, applying the criteria in Clean Water Act regulations to de-designate a beneficial use. This would require the collection and evaluation of information such as presented in the comment. At that time the TMDL and targets could be considered for revision.

Please also see response to comment 2.17 above regarding statewide surveys that are underway to evaluate the shellfish harvesting beneficial use.

**Comment 11.3: "RBRA has no objections to a TMDL using a water-based recreation water quality objective or standard. "**

Comment noted.

**Comment 11.4: "In several parts of the implementation plan portion of the proposed TMDL, the RBRA is identified as being responsible for various implementation actions. If the TMDL is to be imposed, RBRA requests that the following language be changed: delete the phrase "onboard holding tanks" everywhere it occurs, and substitute instead "onboard sewage collection systems."**

As requested, the Staff Report (Tables 16 and 17) and Basin Plan Amendment (Table 7.4) have been revised to replace the phrase "onboard holding tanks" with "onboard sewage systems,"

**Comment 11.5: "The spirit in which the TMDL is administered by the RWQCB is very important. In the course of several discussions with your agency's two staff persons Farhad Ghodrati and Naomi Feger and particularly Naomi, RBRA has been given to believe that good faith development and performance of the implementation program (specifics of which are to be developed by our agency) is more important per se than attainment of the shellfish harvest water quality objective. This "good faith effort" versus rigid attainment orientation is important to our Board in determining, for example, whether or not to undertake a formal "use attainability analysis" that would**

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likely eliminate the shellfish harvest water quality objective for the reasons summarized in item 1 above. RBRA and the public agencies it represents place a strong emphasis on environmental protection. The fact that shellfish harvest standards are currently sometimes met in Richardson's Bay illustrates the environmental commitment of RBRA's jurisdictions. If unreasonable and punitive enforcement actions were to arise from our (and other agencies') future inability to achieve complete compliance with the shellfish harvest water quality objective, RBRA could be forced to consider legal options such as what transpired in the recent 18 jurisdiction "Cities of Arcadia" Superior Court case.

Comment noted.

**PART III: STAFF RESPONSES TO ISSUES RAISED AT APRIL 9, 2008  
BOARD MEETING**

**Board member McGrath asked a question about the locations in Richardson Bay that show spikes in the pathogen data. He said he would like to see the staff report discuss the causes of the spikes spatially in terms of their locations and potential sources.**

As illustrated in Figure 5 in the staff report, there are two coliform spikes observed near the Waldo Point Harbor (a primarily houseboat marina) and the Sausalito Yacht Harbor/Pelican Harbor (two vessel marinas) areas. These areas are subject to a variety of potential sources of pathogens, including inadequate sewage collection systems in floating homes and vessel marinas, stormwater runoff, sanitary sewer discharges, and wildlife. It should be noted that the available data are limited in scope, both in time and area covered, and preclude a more in-depth discussion in the Staff Report. The TMDL calls for an enhanced monitoring program in the Bay, and the focus of this effort will be to better define problem areas and causes.

**Board member McGrath also asked if we could provide a map of the sanitary sewer overflows (SSOs) so we could evaluate their contribution to the exceedances.**

At the present time, given the sporadic nature of the SSO occurrences and the low frequency of monitoring conducted to date, the likelihood of such a map showing the contribution of SSOs to exceedances of the water quality objectives is very low.

A map may be easier to prepare in the future as an updated system for reporting and tracking SSOs is now in place.

**Board member McGrath also asked about how significant the contribution is from anchor-outs?**

We do not know for sure. The number of anchor-outs is relatively small but since they have no sewer hookups, they pose a bigger potential threat that sewage might be illicitly discharged into the Bay. However, many of the anchor-outs pay to have their sewage pumped out, and the Richardson Bay Regional Agency has a grant project from the Department of Boating and Waterways in the works to ensure that all anchor-outs will have access to the mobile sewage pumpout service already available in Richardson Bay to haul out their waste.

**Board member McGrath found the slide on the time series and the locations to be extremely valuable. He stated that he would love to see some more data about the longer time particularly in the hot spots so we can get some idea of what's the rate of recovery and those things.**

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**Board member McGrath also suggested that maybe we should spend a little bit of time on monitoring in the past and how maybe it should be changed in the future so we'd have a little better idea.**

Staff agrees with the Board member and some other commenters that a more robust water quality monitoring plan is needed for the Bay and will work with the interested parties to design and implement such plan.

**Ms. Brooke Langston from Marin Audubon stated that Audubon Society is in support of the increased water quality measures and the TMDL loads that staff is working on, and thinks those are good for the Bay and, regardless of shellfish harvest or not, they are excited about the improved water quality. She also stated that they would be interested in coordinating their water quality monitoring efforts with those of Water Board's staff.**

Staff appreciates Marin Audubon's offer to collaborate with staff in conducting water quality monitoring throughout the Bay and looks forward to working with them.

**Ms. Amy Chastain from Baykeeper raised two issues and listed Baykeeper's recommendation for additional requirements in the TMDL.**

These issues and recommendations are also in Baykeeper's comment letter and are addressed in the previous section.

**Vice Chair Board Member Young asked staff to look into the recommendations from Baykeeper about additional implementation measures for the sanitary sewer systems and the houseboat and vessel implementation measures and to look into the recommendations from the grand jury report and the US EPA report. She also asked that we consider more aggressive measures for addressing pet waste.**

Staff evaluated the additional implementation measures recommended by Baykeeper as well as the additional recommendations referenced in the comments. These recommendations are being addressed through other regulatory actions, e.g., wastewater NPDES permits, modifications to the General WDR for sanitary sewer overflows, U.S. EPA's April 2008 enforcement orders (USEPA, 2008a; USEPA, 2008b) for Richardson Bay's sewage collection agencies, and future possible Board enforcement actions due to the January 2008 sewage spills; therefore they are not included in this TMDL.

As for having more aggressive measures to address pet waste, the implementation plan does not preclude additional aggressive measures for pet waste management. Staff will work with the stormwater programs, county, and the municipalities to develop more

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aggressive pet waste control measures. County staff has suggested, for example, conducting outreach through local pet stores.

**PART IV: STAFF RESPONSES TO PEER REVIEW COMMENTS ON  
OCTOBER 16, 2007 VERSIONS OF THE STAFF REPORT AND BASIN  
PLAN AMENDMENT DRAFTS**

Note: the staff report and Basin Plan Amendments were revised based on the peer reviewer's comments prior to release for public comment on February 8, 2008.

**Peer Review Comments from Dr. Kara Nelson, Assistant Professor of Civil and Environmental Engineering, University of California at Berkeley, January 10, 2008**

**Peer Review Comment 1.1: The problem statement is based upon sound scientific knowledge, methods, and practices. There is a large database of monitoring data over time and space indicating exceedances of water quality criteria (for both shellfish harvesting and recreational use) for fecal coliform bacteria, *E.coli*, and Enterococcus.**

Comment noted.

**Peer Review Comment 1.2: The numeric targets are based upon sound scientific knowledge, methods, and practices, which support setting the numeric targets equivalent to the water quality criteria for the designated uses.**

Comment noted.

**Peer Review Comment 1.3: The source assessment identifying houseboats and marine vessels as major sources of fecal contamination is based upon sound scientific knowledge, methods, and practices. However, I found that the data on stormwater runoff, sanitary sewer overflows, and wildlife were much weaker. For example, based on data in Table 6 and Figure 5, it was concluded that the exceedances are noticeably higher during the wet season. However, I don't find the data sets to be *that* different, given the large variability typically associated with fecal coliform concentrations. It would be helpful if statistical analysis were completed comparing the two data sets (including individual data points, not just medians), and then modifying the language referring to the wet season accordingly. It is also not possible, at least from the data presented in the report, to identify whether SSOs or stormwater or both contribute to the exceedances, and this should be made clearer.**

Staff agrees with the reviewer's comments that the staff report conclusions regarding the wet season exceedances as compared to the dry season exceedances may not be confirmable until additional wet season monitoring data are collected and analyzed. Accordingly, the staff report was revised as follows:

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During winter 2007 monitoring, 14 of 19 sampling stations exceeded the shellfish median WQO, and 17 of 19 stations exceeded the shellfish 90th percentile objective. ~~The relatively sharp jump in the number of wet season exceedances could be generally attributed to wet-season-specific sources such as stormwater runoff and sanitary sewer overflows.~~

The relatively mild increase observed in both the concentrations and the number of wet season exceedances may be attributed to wet-season-specific sources such as stormwater runoff and sanitary sewer overflows. However, as mentioned above, only one of the five wet-season sampling events coincided with an actual rainfall event. Therefore, no definitive conclusions could be made as to what are the actual contributions from season-specific sources, such as stormwater runoff and sanitary sewer overflows, in Richardson Bay. To determine the real contributions from these sources, additional wet-weather monitoring during or immediately after rainfall events needs to be conducted. Additionally, to better characterize the relative contributions of stormwater runoff vs. sanitary sewer overflows, specific future monitoring sites should be chosen such that they are directly downstream of large stormwater drains and likely sanitary sewer overflow conduits.

**Peer Review Comment 1.4: I agree that stormwater runoff, sanitary sewer overflows, and wildlife are likely sources of indicator bacteria, and should therefore be addressed in the TMDL. No additional data are needed to implement the TMDL.**

Comment noted.

**Peer review Comment 1.5: However, the monitoring program should be designed to better understand the importance of these sources (see suggestions under item 6.)**

Staff agrees that the existing water quality monitoring plan for the Bay can be improved. As such, staff intends to collaborate with other interested parties to design and implement a robust water quality monitoring plan for Richardson Bay.

**Peer Review Comment 1.6: The TMDL allocations are based upon sound scientific knowledge, methods, and practices, and support the “theoretical” allocations specified in Table 12. I say “theoretical” since there does not appear to be a mechanism for actually measuring these allocations, nor is it necessary since the tracking mechanism is that each implementing party must complete certain actions, and not demonstrate that the actual TMDL allocations are met by measuring fecal coliform concentrations in the actual sources.**

Comment noted.

**Peer review Comment 1.7: The TMDL implementation plan is based upon sound scientific knowledge, methods, and practices, except that I would like more information regarding the SSOs. It is stated in the last paragraph of the SSS section**

(p.42) that “the WDRs prohibit any overflow that results in a discharge of untreated or partially treated wastewater to waters of the US.” I presume that all of the SSOs listed in Table 9 are therefore not allowed? Does the implementation action (Table 16) for the municipalities therefore mean that no SSOs will be allowed? Please clarify.

Yes, the commenter’s assumption is correct that the TMDL prohibits any discharge of waste due to sanitary sewer overflows. This is further indicated in the staff report by proposing a pathogens discharge allocation of zero to all sanitary sewer collection agencies in the Richardson Bay Watershed.

**Peer Review Comment 1.8: I have another concern regarding the adaptive implementation plan. In Section 8.5 it is stated that “...if it is infeasible to meet the allocation due to wildlife contributions, the Water Board will consider revising the allocations as appropriate.” This statement concerns me for a couple reasons. First, it is unreasonable to expect that a fecal coliform concentration of zero can be achieved anywhere in the bay. Thus, even if there are absolutely no discharges from houseboats, for example, the measured concentration in the vicinity of houseboats will never measure zero. Second, the monitoring plan does not appear to include any measures for quantifying what the contributions from wildlife are.**

Staff agrees with commenter’s observation. Section 8.5 (currently section 9.5) of the staff report was revised as follows:

~~If a discharger demonstrates that all implementation measures have been undertaken but it is infeasible to meet the allocation due to wildlife contributions, the Water Board will consider revising allocations as appropriate.~~ If source control actions are fully implemented and the TMDL targets are not met, the Water Board may consider re-evaluating or ~~revising the TMDL, numeric targets, and allocations~~ the attainability/applicability of the TMDL and the numeric targets (water quality objectives). If the required actions are not fully implemented, the Water Board may consider additional regulatory controls or take enforcement actions against parties or individual dischargers not in compliance.

**Peer Review Comment 1.9: The monitoring plan for addressing fecal coliform inputs from houseboats and marine vessels is based upon sound scientific knowledge, methods, and practices.**

Comment noted.

**Peer review Comment 1.10: However, I would like to see the monitoring program expanded to achieve better understanding of the importance of the other sources. Much more useful information could be gained from the monitoring program if the following suggestions were incorporated:**

Monitoring sites should include better spatial coverage of Richardson Bay. Specifically, sites should be chosen that are directly downstream of large stormwater drains, SSOs, and in major wildlife habitat. In addition, at least two other “control” sites should be chosen that are located in different areas of the bay that are not under the direct influence of any of the potential sources (I am not convinced that control site C is sufficiently representative of the bay.)

Please see response to peer review comment 1.5 above.

**Peer review Comment 1.11: An improved map is needed showing the location of SSOs, the main stormwater drains, wildlife habitat, and the sampling locations.**

This is a good idea that we will look into collecting the information necessary to prepare an integrated map of this nature. However, we don’t believe that the absence of this kind of map undermines the scientific validity of the TMDL.

**Peer Review Comment 1.12: Precipitation and SSOs should be documented during the wet weather monitoring, so that the timing of likely contamination events can be correlated with the water quality data.**

Staff agrees.

**Peer Review Comment 1.13: My only comment here is that the report could be improved by providing clearer distinctions between pathogens and indicator organisms throughout the report. The definitions provided are fine, as is the justification for monitoring indicator organisms. In a few cases, however, the term “pathogens” is used when “indicator organism” would be more accurate. (For example, in the 2nd paragraph of the introduction “It discusses background conditions and results of monitoring of *pathogen* levels in RB.”)**

Staff agrees. The staff report has been revised accordingly to provide a clearer distinction between pathogens and indicator organisms.

**Peer Review Comments from William A. Yanko, Environmental Microbiology Consultant, December 16, 2007**

Peer Review Comment 2.1: First, I would like to emphasize that none of the comments or critiques offered in the following review should be interpreted as an effort to denigrate in any way the primary goals of the TMDL. It appears reasonably clear that boats and marinas, as described in the TMDL documentation, represent a significant source of fecal pollution in Richardson Bay and greater efforts are needed to abate that source. The document clearly suggests that boats and marinas represent a major source of contamination, and that there is already a statutory authority to deal with that issue, but “legal and technical obstacles” have prevented resolution. It is not clear how the TMDL will alleviate this issue when statutory authority already exists, but has apparently not been fully enforceable. Efforts to reduce and control sewer overflows and any other identifiable point sources are clearly warranted.

Comment noted.

Peer Review Comment 2.2: One general aspect of the TMDL document that concerns me is the seemingly interchangeable use of the terms “fecal coliform” and “pathogen”. This seems to have become common practice with TMDL’s, but it is scientifically inaccurate and misleading. Section 3 briefly discusses the concept of fecal indicators, and it is undeniable that fecal coliforms are commonly used in TMDL’s, in spite of a growing body of evidence of the problems with this indicator as a reliable predictor of risk. At best fecal coliform, and all fecal indicators, indicate an increased probability of pathogens being present. There simply is not a direct quid pro quo relationship that warrants the use of the terms as being synonymous.

A recent review of indicator organism concepts by the World Health Organization (WHO) (Ashbolt et al. 2001) stated, “in short, there is no direct correlation between numbers (emphasis added) of any indicator and pathogens (Grabow 1996)”.

Traditionally, indicator microorganisms have been used to suggest the presence of pathogens. That in itself is a valid concept; however, we now understand that there are a myriad of possible reasons that indicators may be present and pathogens absent, or vice versa (Ashbolt et al., 2001). These include differences in survival between pathogens and indicators, the sources of the microorganisms, e.g., fecal vs. natural, and, in some cases, the ability to multiply in the environment. Furthermore, viruses and other pathogens are not part of the normal fecal microbiota; only infected individuals excrete them. Epidemic occurrence of disease significantly affects the number of pathogens present in human waste, but has little or no affect on indicator organism concentrations.

In addition, the occurrence of some pathogens varies on a seasonal basis. This reviewer demonstrated probability relationships between the concentrations of indicator organisms and the probability of specific bacterial pathogens being present in both treated biosolids and surface water, i.e. as indicator organism concentrations increased, the probability of detecting specific pathogens increased (Yanko, 1987; Yanko et al., 2003). Nevertheless, probabilistic relationships, while useful, are very different from direct correlations between numbers of indicators and numbers of pathogens.

The statement that there is no direct correlation between indicator organisms and pathogens should not be interpreted to suggest that monitoring for indicator organisms has no value. They can very successfully and appropriately be used as (1) process indicators, (2) fecal indicators and (3) index and model organisms (Ashbolt et al., 2001).

In the case of the TMDL, organisms that indicate the presence of fecal contamination, such as the bacterial groups thermotolerant coliforms (fecal coliform) or *E. coli* are applicable. However, it is important from the scientific perspective that the distinction that fecal coliforms only infer that pathogens may be present is crucial to maintaining an accurate scientific discussion.

Please see response to peer review comment 1.13 above.

Peer Review Comment 2.3: Fecal coliform is typically being used as the indicator of choice in TMDL's primarily due to convenience because the available historical data indicating impairment are based on state fecal coliform standards. So the process continues even though it is recognized this group is most likely not the preferred indicator of risk.

Health risk is really the primary issue and fecal coliforms have a relatively poor record of predicting risk. This was detailed in a recent review by USEPA scientists (Arnone and Walling, 2007) and was the subject of an EPA Workshop "Report of the Experts Scientific Workshop on Critical Research Needs for the Development of New or Revised Recreational Water Quality Criteria" (EPA, 2007). The problem of using traditional fecal indicators to assess risk is further exacerbated when dealing with non-point sources, as was recently shown in Mission Bay (Colford et al., 2007).

While the reviewer's comment about "fecal coliforms having a poor record of predicting risk" may be true, in the case of this TMDL, fecal coliforms are used because the existing national, state, and regional water quality standards for shellfish harvesting waters are all based on coliform organisms. At the present, no other water quality standard exists for shellfish harvesting. The staff report does, however, state that if better indicator

organisms/standards are available in the future, the TMDL will be revised to include such indicators/standards.

**Peer Review Comment 2.4: The use of existing fecal coliform limits is problematic from a risk-based perspective, as noted above, but has become the defacto indicator of choice for practical reasons.**

As explained above, the proposed numeric targets are based on existing national, state, and regional water quality standards for shellfish harvesting waters and are not created by this TMDL.

**Peer Review Comment 2.5: Setting the shellfish limit as the TMDL single goal obviously addresses the less stringent recreational target, but the shellfish limits may present some difficult problems that I will touch base on in the following sections. I would personally prefer to see a more creative approach incorporated into pathogen TMDLs, such as some hybrid of the concepts embraced in the WHO and EU criteria (EPA, 2007), but it is unclear if the current TMDL process can accommodate that. One key problem is not having any reasonable excursion frequency. Criteria that incorporate some kind of “can’t exceed” a percentage of the time help provide an incentive for increased monitoring, which in turn provides a better understanding of the problem.**

The proposed targets are based on the average value of a minimum of five sampling events and in addition do allow that the given indicator bacteria concentrations “can’t be exceeded” more than 10 percent of the time.

**Peer Review Comment 2.6: My sense is that the source assessment is a weak link in this TMDL document.**

Staff asserts that, for the purpose of this TMDL, all significant and controllable sources of pathogens in the Richardson Bay Watershed are adequately identified and addressed in the implementation plan.

**Peer Review Comment 2.7: As noted in the beginning, these comments are not intended to imply that known point sources should not be actively controlled, such as the houseboats, vessels, sewer overflows, etc., and it appears there is already an enforcement mechanism for these sources that has not been adequately implemented.**

Comment noted.

**Peer Review Comment 2.8: Other potentially important sources were not convincingly assessed, or were not mentioned at all. The pollutant source assessment ignores the**

**experience of other California coastal source tracking studies that have demonstrated significant contributions from wildlife, including birds, seals and sea lions. These include La Jolla, Morro Bay, and Campbell Cove (Bodega Bay).**

Staff made the decision in developing this TMDL to not spend the resources, which can be significant, to establish definitively whether or not wildlife is contributing significantly to the bacteria exceedances measured in Richardson Bay. The TMDL acknowledges that wildlife is a potential source of pathogens; however that source is not controllable, and there are other controllable sources that are addressed in the TMDL implementation plan.

The other “California coastal source tracking studies” mentioned by the reviewer have utilized the more recently developed Microbial Source Tracking (MST) methodologies such as the bacterial DNA fingerprinting. These new methodologies, although promising, are still inaccurate, unproven, and controversial. Furthermore, they cost several hundred thousand of dollars and take a few to several years to complete. For example, a recent MST study which was completed in the San Francisco Bay Region in the San Pedro Creek Watershed (near the City of Pacifica) in late 2007, took more than three and half years and \$400,000 to complete. Unfortunately, despite the cost and the time it took to complete this project, there was only 21 percent agreement between the results reported by the two separate laboratories who analyzed the same set of samples.

Further, as stated in the staff report and quoted below, the TMDL also includes appropriate language that should address the concerns of dischargers that they will be held responsible for contributions from wildlife. Section 9.4 of the staff report states that:

The Water Board will not hold discharging entities responsible for uncontrollable coliform discharges originating from wildlife/natural background sources. If pathogen indicator contributions from wildlife/natural background are determined to be the primary cause of water quality objectives exceedances, the attainability/applicability of water quality objectives will be evaluated as part of the adaptive implementation program.

Lastly, no matter what the actual contribution from the wildlife source category in Richardson Bay may be, the other identified sources would still be required to implement the same management measures proposed in the staff report and the Basin Plan amendment to address their contributions to the problem.

**Peer Review Comment 2.9: A recent study in Orange County showed that wild animal sources and environmental growth were the significant sources of indicators in urban runoff (Jiang, et al. 2007). The Richardson Bay source assessment seems to disregard the wildlife component based on a single sampling station.**

## Appendix D. Staff Responses to Comments

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The wildlife component is addressed in the TMDL. Staff agrees with the reviewer's comment that additional studies could be done to better characterize the contributions from the wildlife source category. However, as explained in the previous response, staff asserts that, for the purpose of this TMDL, all controllable sources of pathogens in the Richardson Bay Watershed are adequately identified.

**Peer Review Comment 2.10: This may be especially problematic for meeting the shellfish standards because in many cases the areas of greatest shellfish densities may also be areas with significant wildlife. Isolated primitive areas in British Columbia with essentially no anthropogenic sources have experienced chronic problems with shellfish fecal coliform standards related to wildlife fecal sources (Beach, 2002), so this is not a purely theoretical question.**

Comment noted. To address this question, as part of the adaptive implementation plan, staff is planning on collaborating with the Marin Audubon Society to gather water quality monitoring data from their sanctuary area of Richardson Bay. These data should be representative of the isolated wildlife impact on water quality in the Bay.

**Peer Review Comment 2.11: Storm runoff is a major source of bacterial contamination and many programs dealing with fecal bacterial contamination have separated their program into wet weather and dry weather components. While there is evidence presented in the Richardson Bay document of increased contamination during the winter, the data do not suggest a dramatic difference. I was surprised there was not a greater storm effect than suggested by these data; however, it is not clear from the presentation of the data or the accompanying discussion if storm events were actually captured by the sampling program.**

Staff agrees with the reviewer's observation. Only one of the wet-season sampling events coincided with a storm event. Staff clarified section 4.5 of the staff report to reflect which sampling events coincided with a storm event.

**Peer Review Comment 2.12: If storm events were not effectively represented by the winter data, combining the dry season and wet seasons may present some very difficult challenges.**

Comment noted.

**Peer Review Comment 2.13: Other potential sources of indicator bacteria that are proving to be significant were not addressed in the source assessment. These are (1) sediments and (2) rotting vegetation at the wrack line.**

As this is a "pathogens" and not an "indicator bacteria" TMDL, the focus of the source identification has been on identifying significant and controllable sources of the actual

pathogens and not the “indicator bacteria” sources such as “sediment and rotting vegetation at the wrack line.” As such, staff asserts that, for the purpose of this TMDL, all significant and controllable sources of pathogens in the Richardson Bay Watershed are adequately identified. Additionally, no water quality benefit would be gained from delaying the TMDL implementation to spend additional time and resources to assess other probable but insignificant and uncontrollable sources of pathogens.

Further, as explained above, the source categories are only responsible for controlling their own “pathogens” contributions and not “indicator bacteria” contributions from other sources.

**Peer Review Comment 2.14:** Numerous studies are identifying sediments as a major reservoir or indicator bacteria, and any event that disturbs sediments, whether human or natural, may have a significant effect on indicator densities. The importance of sediment reservoirs of indicator bacteria was recently shown in Southern California at Newport Dunes (Jiang, et al, undated). This study concluded sediment resuspension could be an important source of water column bacterial contamination. Sediments may also support growth of indicators. Low flow creek runoff was treated to remove contaminants at Aliso Creek, but the fecal coliforms were back to original densities within a short distance. This evaluation of treating the creek flow concluded “The bacterial regrowth in the habitat is a larger problem and beyond the intended performance of the CCS system. It is difficult to determine if the CCS system installation at the Springdale Storm Drain has contributed to the reduction in postings at the Aliso Beach” (Anderson, 2004). One study on the east coast reported sediment resuspension rates could account for fecal coliform concentrations ranging from 7 to 18 FC/100 mL seawater (Valiela et al. 1991).

Please see response to peer review comment 2.13 above.

**Peer Review Comment 2.15:** At another study at an east coast bay, elution of fecal coliforms from shoreline deposits of decaying vegetation (wrack) represented an important fecal coliform source. Both laboratory and field experiments suggested significant elution of bacteria from wrack,  $\sim 3 \times 10^{12}$  FC yr<sup>-1</sup> on a bay-wide basis (6% of annual input), primarily by periodic tidal flooding and possibly by major rain events (Weiskel, et al., 1996). Amplification of indicator bacteria in shoreline wrack has also been demonstrated to be a major issue at southern California beaches (Martin and Gruber, 2005). These authors noted that their field investigations showed that the wrack line acts as a bacterial reservoir that can impact receiving waters. Indicator bacteria were concentrated in the organic debris deposited on the beach during spring tides, maintained in the wrack above the water line during neap tides, and then released back to the receiving waters during subsequent spring tides. At some locations, this process was considered to be a significant cause of bacterial water quality standard exceedances. This also has a monitoring implication in that the

**timing of sampling relative to the tidal cycle may be a factor affecting indicator concentrations.**

Unlike Southern California's coastal shorelines, the Richardson Bay shoreline (at least the area of the Bay that the water quality monitoring stations are located in) contains none to very little rotting vegetation such as kelp at the wrack line. Also, please see response to peer review comment 2.13 above.

**Peer Review Comment 2.16: There is quite a body of data available regarding some of these confounding sources of indicator bacteria, including both fecal coliforms and enterococci that were not considered in the Richardson Bay document.**

Please see response to peer review comment 2.13 above.

**Peer Review Comment 2.17: Per the comments under source assessment, I would question if the load allocations adequately address potential sources of indicator bacteria.**

We believe that we have adequately addressed all potential sources of pathogens. Please see response to peer review comments 2.8, 2.9, 2.10, and 2.13 above for more information.

**Peer Review Comment 2.18: Section 7 of the TMDL document, titled "Linkage between Water Quality Targets and Pollutant Sources" contains the statement "Since pathogen regrowth is very unlikely in this waterbody, net pathogen die-off is virtually certain. Therefore, pathogen densities at any point downstream of the initial point of discharge will be lower than at the point of discharge." If potential sediment sources are considered and the tidal wrack line is considered part of the "waterbody", I would question this conclusion based on the data discussed above.**

Section 7 (currently Section 8) of the staff report was revised to delete this statement.

**Peer Review Comment 2.19: No comments on the implementation plan. Most of this represents sound sanitation practices. To some extent the language in paragraph 8.5 that refers to revising, reevaluating, etc address some of the issues raised in my review comments.**

Comment noted.

**Peer Review Comment 2.20: The end of paragraph 9.1 refers to section 8.6. There was no paragraph 8.6 in my copy. Should this just be a general reference to Section 8?**

This typo has been fixed.

**Peer Review Comment 2.21: I am not personally familiar enough with the details of the area to comment on specific sampling locations. If I were actively involved in this TMDL, I would certainly want to address some of the source issues noted above.**

Comment noted. Please see response to peer review comment 1.5 above.

**Peer Review Comment 2.22: I would also want to confirm that the fecal coliform concentrations were primarily E.coli. USEPA suggests a ratio of 126 E. coli per 200 fecal coliforms. I personally think that is a low ratio. In a large surface water database developed for a WERF Project, which was heavily weighted by California sampling locations, the average ratio of E. coli to fecal coliform was about 80 percent E. coli (Yanko et al., 2003). If one encountered samples with a high ratio of non-E. coli thermotolerant coliforms, it would raise additional questions about source. Confirming the E. coli component of the fecal coliform test can be accomplished easily with little additional cost by incorporating MUG (Standard Methods 9222 G.) into the standard fecal coliform MPN test referenced in Table 18.**

Comment noted. Richardson Bay Regional Agency, as part of its water quality monitoring program, collects E.coli data at the same monitoring sites as the fecal coliform data. If needed, this enables us to compare/correlate the E.coli and fecal coliform data from the same sites.

**Peer Review Comment 2.23: I have detailed my specific concerns and questions in each of the categories above.**

Comment noted.

**Peer Review Comment 2.24: As noted in the above discussion I have concerns that recent data and experiences from other TMDLs have not been fully considered in the Richardson Bay document. Significant public resources are going into these projects and much is being learned. I think we have an obligation to draw on the efforts and experiences of others and incorporate those lessons into new and developing control projects.**

A lot of the “recent data and experiences from other TMDLs” are most likely specific to those particular TMDLs and locations. The focus of this TMDL is on implementing corrective actions to prevent sewage discharges in the Richardson Bay Watershed. As such, we believe it would be a better use of everyone’s resources if we focus on controlling the known, significant, and controllable human sources of pathogens instead of uncontrollable sources of indicator bacteria.

**REFERENCES:**

California State Water Resources Control Board, September 2004. Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List.

U.S. Environmental Protection Agency (USEPA). 2008a. Finding of Violation and Order for Compliance. Docket No. CWA-309(a)-08-030, Region IX, Water Division.

U.S. Environmental Protection Agency (USEPA). 2008b. Finding of Violation and Order for Compliance. Docket No. CWA-309(a)-08-031. Region IX, Water Division.