

Appendix D

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OVERVIEW OF COMMENT AND RESPONSE PROCESS

On March 4, 2005, the California Regional Water Quality Control Board, San Francisco Bay Region released for public review and comment a Staff Report and proposed Amendment to the San Francisco Bay Basin Plan that will establish a Pathogens Total Maximum Daily Load (TMDL) for Tomales Bay and tributaries and implementation plan. During the public review and comment period (which closed on April 20, 2005) the Water Board received 18 comment letters. In response to comments, we made changes to the Staff Report and the proposed Basin Plan Amendment, as appropriate.

A number of issues were raised by multiple commenters in this first round of public review. The proposed TMDL targets and load allocations; TMDL targets for shellfish harvesting areas; how we addressed pathogen contributions from wildlife ("background"); source identification and allocation; the use of microbial/bacterial source tracking (MST or BST) studies to identify pathogen sources; and the use of indicator bacteria (fecal coliform) instead of actual pathogens in our investigations and TMDL development, were of some general interest.

On April 20, 2005, the Water Board convened a public hearing on the proposed amendment and staff report. At this time staff responded to additional comments. The hearing was continued to June 15, 2005, at which time Board members asked additional questions and members of the public took the opportunity to comment.

On July 8, 2005, we released a second draft of the Staff Report and proposed Basin Plan Amendment (dated July 8, 2005) for further public review and comment. This draft incorporated changes and additions to the March 4 documents that staff made in response to comments. Through the close of the second comment period on August 8, 2005, the Water Board received 7 additional comment letters. In this round there were two issues of concern to multiple commenters: the stated need for clarification of Table 4-22a in the proposed Basin Plan Amendment; and questions and suggestions about our basis for determining closure days (due to pathogen contamination) for shellfish harvesting areas of Tomales Bay. In response to the second round of comments we made additional changes to the Staff Report and proposed Basin Plan Amendment, as appropriate, below.

This Appendix contains our responses, first to issues of common concerns, and then to other issues raised in individual comment letters, noting changes we are recommending to the proposed Basin Plan Amendment as appropriate. Proposed revisions to the Basin Plan Amendment are illustrated throughout this document. Revisions to the publicly distributed March 4, 2005 document are identified in underline and ~~strikeout~~; revisions to the publicly distributed July 8, 2005 document are identified in double underline and ~~double-strikeout~~. Comments, and responses, are numbered for reference purposes according to the Contents list. We also respond to issues raised at the public hearings that are not covered in our responses to written comments. Finally, references are provided.

Part I: Staff responses to common concerns

I. STAFF RESPONSES TO COMMON CONCERNS

Among the comments received in response to TMDL documents released on March 4, 2005, six issues were repeated multiple times and appeared to be of interest to at least several of the commenting parties. We address these issues below:

- TMDL Targets and Load Allocations
- TMDL Targets for Shellfish Areas
- Background/Wildlife Contribution
- Source Identification and Allocation
- Microbial Source Tracking (DNA) Study
- Use of Indicator Bacteria

TMDL Targets and Load Allocations

The following commenters stated that the proposed coliform bacteria target and load allocation for the tributaries (43 MPN fecal coliform/100 mL) are too stringent, and perhaps unattainable:

Sierra Club Marin Group

Albert Straus, Blake's Landing Farms

Tomales Bay Agricultural Group

Marin Resource Conservation District

Marin Horse Council (MHC)

Western United Dairymen

Marin Agricultural Land Trust

University of California Cooperative Extension

Mike Gale, rancher in Chileno Valley

East Shore Planning Group (ESPG)

County of Marin Environmental Health Services and Community Development Agency

John Hulls

Staff responses are as follows.

- 1) **We have raised the proposed tributary target from 43 to 200 MPN fecal coliform/100 mL.** We agree that the tributary target in the March 4 document may have been overly protective or too stringent, and propose raising it from 43 MPN fecal coliform/100 mL (the water quality objective for shellfish harvesting) to 200 MPN (the water quality objective for recreational uses). We feel this is justified because shellfish harvesting (i.e. human food consumption) is not one of the tributaries' beneficial uses.

Furthermore, water quality monitoring of Third Valley Creek in Inverness, a minimally disturbed watershed on the western shoreline of Tomales Bay, indicates that tributary waters draining these areas contain coliform bacteria below the revised target of 200 MPN fecal coliform/100 mL. Therefore, staff asserts that the revised target is a realistic, attainable goal. (See recent bacteriological monitoring data in Section 3.8 of the Staff Report.)

We propose revising the targets sections of the proposed Basin Plan Amendment as follows:

NUMERIC TARGETS

Table 4-20 contains The the numeric water quality targets for the Tomales Bay Watershed Pathogens TMDL (Table 4-20). The coliform bacteria targets are based on fecal coliform bacteria concentrations aimed at protecting shellfish harvesting and contact and non-contact water recreation beneficial uses shellfish consumers and recreational users. These density-based numeric targets define bacterial densities that indicate associated with minimal risk to humans and are the same as based on the water quality objectives contained in Table 3-1. The Tomales Bay targets are intended to protect the most sensitive beneficial use, shellfish harvesting. The tributary targets are intended While water quality objectives to protect recreational uses. are higher than those for shellfish protection, the more stringent objective applies to tributary waters because tributary discharges to Tomales Bay receive minimal dilution. An additional numeric target for Tomales Bay is expressed as the number of days commercial shellfish growing areas are subjected to harvest closures due to elevated water column bacteria densities. Consistent with the definition of "threatened conditions" in the California Shellfish Protection Act, Tomales Bay shellfish growing areas shall not be closed for harvest for more than 30 days per calendar year. The California Department of Health Services requires shellfish growing areas to close for harvesting when 24-hour and 10-day rainfall totals exceed established thresholds. Rainfall thresholds are established based on the relationship between rainfall and observed fecal coliform levels in Bay waters and shellfish.

In addition, no human waste (raw sewage or inadequately treated waste) shall be discharged to Tomales Bay or its tributaries. The no human waste discharge target is consistent with the existing wastewater discharge Discharge prohibitions Prohibitions 5 and 15, contained in Table 4-1. This target is necessary because human waste is a significant source of pathogenic organisms, including viruses, and attainment of fecal coliform targets alone may not sufficiently protect human health. The coliform bacterial targets, in combination with the human waste discharge prohibitions and the shellfish harvesting closure targets, are the basis for the TMDL and load allocations, and fully protect beneficial uses.

Table 4-20 Coliform Bacteria Targets^c for Tomales Bay and Its Tributaries (The targets are expressed as Most Probable Number [MPN] of fecal coliforms per 100 mL of water.)	
Waterbody	Fecal Coliform (MPN/100 mL)
Tomales Bay	Median < 14 ^a 90 th percentile < 43 ^b
Tomales Bay Tributaries	Single sample maximum: 43
a. Based on a minimum of five consecutive samples equally spaced over a 30-day period. b. No more than 10% of total samples during any 30-day period may exceed this number. c. These targets are applicable year-round.	

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Table 4-20 Water Quality Targets ^a for Tomales Bay and Its Tributaries
<u>Zero discharge of human waste</u>
<u>Shellfish harvest closures < 30 days/year</u>
<u>Coliform Bacteria Levels</u> <u>(expressed as Most Probable Number [MPN] of fecal coliforms per 100 mL of water)</u>
<u>Tomales Bay</u> <u>Median < 14^b and 90th percentile < 43^c</u>
<u>Tomales Bay Tributaries</u> <u>Log mean < 200^b and 90th percentile < 400^c</u>
^a These targets are applicable year-round ^b Based on a minimum of five consecutive samples equally spaced over a 30-day period ^c No more than 10% of total samples during any 30-day period may exceed this number.

- 2) We have revised the proposed allocations based on modeling which accounts for bacteria die-off.

TMDL targets and allocations are different by definition. TMDL *targets* are an interpretation of water quality standards for a waterbody whereas TMDL *allocations* specify the amount (or concentration) of a pollutant that can be discharged to a waterbody such that standards are attained in the receiving waterbody and all downstream waters. Allocations to sources must be established such that when allocations are attained, all targets are attained. The fact that the Bay target (which protects shellfish harvest) is lower than the tributary target (which protects up-stream recreational uses) raises the question: Where the main tributaries discharge to the Bay, what tributary coliform concentrations are needed in order to attain Bay water quality standards and protect shellfish harvesting, the most sensitive beneficial use in the Bay?

To better answer this question, we used a hydrodynamic model, developed specifically for Tomales Bay and this TMDL, to identify the maximum bacteria levels that can be discharged to the Bay via tributaries and still protect the Bay's beneficial uses. The simulation used to model the originally proposed targets did not account for bacteria die-off, a naturally occurring phenomenon. This omission was acknowledged as a conservative assumption in the March 4 Staff Report. The results of a wet-weather model simulation that accounts for bacteria decay are incorporated into the current Staff Report (Section 7.2) as follows:

7.2 Tomales Bay Modeling

Using a three-dimensional hydrodynamic state-of-the-art numerical model of Tomales Bay, U.C. Berkeley researchers evaluated the fate and transport of fecal coliforms that originate from the Bay's tributaries (Brennan and Stacey, 2005b). More specifically, Brennan and Stacey evaluated the probability of meeting TMDL targets at Bay shellfish growing areas as a function of tributary fecal coliform concentrations. The objective of this modeling effort was to identify tributary fecal coliform concentrations necessary to attain the proposed Bay

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TMDL target and the Water Board's Water Quality Objectives for shellfish harvesting (14 MPN fecal coliform/100 mL 30-day median, 43 MPN fecal coliform/100 mL 30-day 90th percentile).

In order to examine the worst case scenario with respect to tributary effects on shellfish harvesting, the model focused on Walker Creek and adjacent shellfish harvesting sites. A 30-day wet season period was simulated, based on actual hydrographs from December 2003 through January 2004. The modeled period represented an unusually wet month, with over 24 cm (9.5 in) of rainfall. The largest of modeled storms in this period has a return interval of approximately one year. The model produced 30-day time series of predicted bacterial densities at three established shellfish harvesting stations near the mouth of Walker Creek. Fecal coliform densities in Walker Creek were held constant for the entire 30-day simulated period.

In order to account for natural die-off of bacteria in the environment of the Bay, the model incorporated a conservative, first order bacterial decay coefficient of 0.02/hr (Brennan and Stacey, 2005c). It is important to note that this decay coefficient is very conservative. A U.S. EPA review of bacterial decay coefficients in natural waters indicates that 0.02/hr is at the low end of values reported throughout the nation (U.S. EPA, 1985). Furthermore, bacterial disappearance rates observed in the 2000 TBSTAC report suggest much higher die-off rates. Calibration of the model to observed coliform levels in the Bay would be conducted as part of the TMDL adaptive implementation effort.

Modeling showed that the shellfish stations experience a wide range of Walker Creek fecal coliform concentrations in response to the flow patterns created by tides and fresh water discharge. Shellfish stations close to the mouth of Walker Creek experience instantaneous pathogen concentrations close to that of the tributary concentration. Modeling also indicated that in the vicinity of the shellfish stations fecal coliform concentration varies by up to a factor of five at points only 100 meters apart.

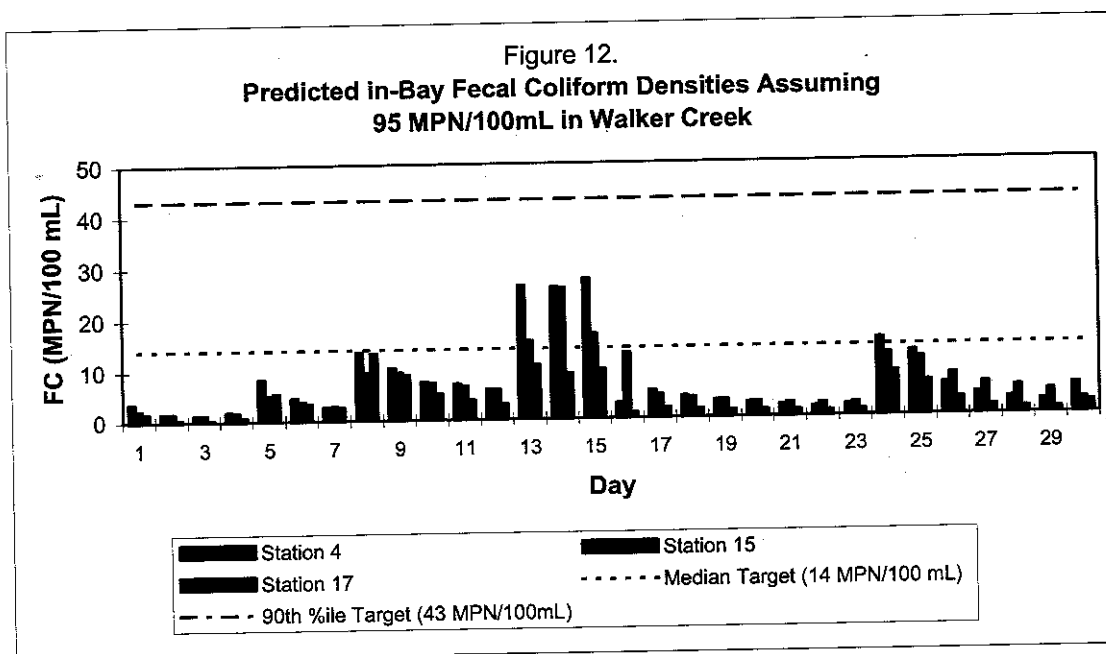
Using model output, Water Board staff calculated 30-day medians and 90th percentiles at the three shellfish stations for different steady-state fecal coliform densities in Walker Creek. These were compared with the Water Board's Water Quality Objectives for shellfish harvesting: 14 MPN fecal coliform/100 mL (30-day median), and 43 MPN fecal coliform/100 mL (30-day 90th percentile). It was determined that the highest Walker Creek fecal coliform density that would meet Water Quality Objectives at all stations was 95 MPN fecal coliform/100 mL. Results are summarized in Table 20, below.

	Bay Shellfish Station		
	4	15	17
Predicted Median	5.1	5.2	2.4
Predicted 90th Percentile	42.9	20.2	20.0

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The California Department of Health Services (DHS) establishes rainfall-triggered closure rules for shellfish harvest in Tomales Bay. These rules are based on in-Bay bacterial levels observed following rainfall events. The rules are subject to periodic revision as new data are acquired. As the TMDL is implemented and coliform loads decline, the rules will need to be reevaluated. Currently, rainfall events over 1.0 cm/24-hr result in a five day closure at oyster leases near the mouth of Walker Creek, and rainfall over 1.65 cm/24-hr results in six days of closure. A ten-day cumulative rainfall in excess of 7.5 cm results in an additional day of closure.

In order to examine the benefit of reducing Walker Creek fecal coliform densities to 95 MPN/100 mL on shellfish harvesting closures, predicted daily geometric means were calculated for the 30-day period simulated by the model output. Results, shown in Figure 12 below, indicate that daily geometric means remain below 43 MPN fecal coliform/100 mL throughout the modeled 30-day scenario, and only exceed 14 MPN/100 mL for four days. Thus, it appears that reducing Walker Creek fecal coliform densities to 95 MPN fecal coliform/100 mL will provide a significant reduction in rainfall-triggered closures and result in shellfish closure days well below the target of less than 30 days per year.



In summary, this analysis indicates that a tributary load allocation of 95 MPN fecal coliform/100 mL will result in attainment of TMDL targets for the Bay. The allocation will also result in meeting Water Board Water Quality Objectives for shellfish harvesting waters under most conditions, and will reduce shellfish harvesting closures to less than 30 days per year.

After considering the results of this modeling, we propose including geographic-based allocations that apply at the bottom of Walker and Lagunitas Creeks where they discharge to the Bay. These allocations reflect the highest fecal coliform concentrations that can be

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discharged from the tributaries while still protecting the shellfish harvesting beneficial use. We propose the following revisions to the Basin Plan Amendment:

LOAD ALLOCATIONS

TMDL targets are an interpretation of water quality standards, whereas TMDL allocations specify the amount (or concentration) of a pollutant that can be discharged to a waterbody such that standards are attained in both the receiving waterbody and all downstream waters. Table 4-22a presents density-based load allocations for Tomales Bay Watersheds watersheds pathogens source categories that implement tributary targets, and Table 4-22b presents allocations to specific major tributaries, where they discharge to Tomales Bay, and implement the Bay targets. Load allocations to the tributaries reflect the highest fecal coliform concentrations that can be discharged while still attaining and maintaining the Bay shellfish harvesting water quality objectives in the Bay. All entities in a watershed are responsible for meeting their source category allocation (Table 4-22a) and the applicable geographic-based allocations (Table 4-22b).

Discharging entities will not be held responsible for uncontrollable coliform discharges originating from wildlife. If wildlife contributions are determined to be the cause of exceedances, the TMDL targets and allocation scheme will be revisited as part of the adaptive implementation program. The discharge of human waste is prohibited. All sources of human waste have an allocation of zero. Nonpoint source runoff containing coliform bacteria of animal and wildlife origin, at levels that do not result in exceedances of water objectives, does not constitute wastewater with particular characteristics of concern to beneficial uses. Therefore, animal- and wildlife-associated discharges, in compliance with the conditions of this TMDL, do not constitute a violation of applicable discharge prohibitions.

When all dischargers (i.e., individual facilities, property owners, etc.) associated with each source category meet the density-based allocation, the TMDL allocations will be achieved. Alternatively, when tributary waters meet the density-based allocation, the TMDL allocations will be achieved.

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Table 4-22a Density-Based Pollutant <u>Wasteload and Load Allocations^{ad}</u> for Dischargers of Pathogens in Tomales Bay Watershed			
Categorical Pollutant Source	<u>Wasteload and Load Allocations</u> Fecal Coliform (MPN/100 mL)		
	For Direct Discharges to the Bay		For Discharges to Major Tomales Bay Tributaries
	Median^{ba}	90th percentile^{cb} Maximum	Log Mean^b Single-Sample Maximum
Onsite Sewage Disposal Systems	0	0	0
Small Wastewater Treatment Facilities	0	0	0
Boat Discharges	0	0	N/A
Grazing Lands (Ranchlands and Riparian Pasturelands)	≤14	≤43	43 <u>95 < 200</u>
Dairies	≤14	≤43	43 <u>95 < 200</u>
Equestrian Facilities	≤14	≤43	43 <u>95 < 200</u>
Municipal Runoff	≤14	≤43	43 <u>95 < 200</u>
<u>Wildlife^c Open space lands (terrestrial wildlife)^d</u>	≤14	≤43	43 <u>95 < 200</u>
<u>In-Bay Background (marine wildlife)^d</u>	≤14	≤43	N/A

a. These allocations are applicable year-round. Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.

b.a. Based on a minimum of no less than five consecutive samples equally spaced over a 30-day period.

c.b. No more than 10% of total samples during any 30-day period may exceed this number.

d.e. Although wildlife is Open space lands and the Bay contain wildlife and are therefore recognized as a potential source areas. It is These areas are not believed to be a significant source of pathogens and their contribution is considered natural background; therefore, no management measures are anticipated for this source required.

d. These allocations are applicable year-round.

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TABLE 4-22B DENSITY-BASED POLLUTANT LOAD ALLOCATIONS FOR TOMALES BAY TRIBUTARIES	
<u>Tributary</u>	<u>Allocation Fecal Coliform (MPN/100 mL) Log Mean</u>
<u>Walker Creek at Highway 1 Bridge</u>	<u>95^a</u>
<u>Lagunitas Creek at Green Bridge</u>	<u>95^a</u>

a. Based on a minimum of five consecutive samples equally spaced over a 30-day period.

TMDL Targets for Shellfish Areas

Three commenters suggested that a reduction in the number of days each year when shellfish beds are closed to harvesting due to pathogens contamination is a more realistic goal for this TMDL than attainment of density-based targets or zero closures. Commenters cited the 1995-96 investigations of the Tomales Bay Shellfish Technical Advisory Committee (TBSTAC).

These commenters are:

- University of California Cooperative Extension
- Point Reyes National Seashore (U.S. Dept of the Interior, National Park Service)
- California Department of Health Services

Staff response:

We added a shellfish harvest closure target in accordance with these comments.

Staff agrees that shellfish harvesting closure days are a useful indicator of the water quality in Tomales Bay and reducing the number of closure days is a worthy goal. The proposed target of reducing closures to 30 or fewer days per year is consistent with the definition of "threatened conditions" in the California Shellfish Protection Act. The following language has been added to the Basin Plan Amendment:

NUMERIC TARGETS

.... An additional numeric target for Tomales Bay is expressed as the number of days commercial shellfish growing areas are subjected to harvest closures due to elevated water column bacteria densities. Consistent with the definition of "threatened conditions" in the California Shellfish Protection Act, Tomales Bay shellfish growing areas shall not be closed for harvest for more than 30 days per calendar year. The California Department of Health Services requires shellfish growing areas to close for harvesting when 24-hour and 10-day rainfall totals exceed established thresholds. Rainfall thresholds are established based on the relationship between rainfall and observed fecal coliform levels in Bay waters and shellfish.

Table 4-20 Water Quality Targets^a for Tomales Bay and Its Tributaries
<u>Zero discharge of human waste</u>
<u>Shellfish harvest closures < 30 days/year</u>
<u>Coliform Bacteria Levels</u> (expressed as Most Probable Number [MPN] of fecal coliforms per 100 mL of water)
<u>Tomales Bay</u> Median < 14^b and 90th percentile < 43^c
<u>Tomales Bay Tributaries</u> Log mean < 200^b and 90th percentile < 400^c
<small>^a These targets are applicable year-round</small>
<small>^b Based on a minimum of five consecutive samples equally spaced over a 30-day period</small>
<small>^c No more than 10% of total samples during any 30-day period may exceed this number.</small>

Background/Wildlife Contribution:

Several commenters stated that background/wildlife pathogen contributions are neither well understood nor accounted for in the TMDL. Some of these individuals stated that those background fecal coliform levels might be so significant that they alone could result in exceedance of the proposed tributary targets and load allocations of 43 MPN fecal coliform/100 mL.

Commenters who raised these issues are:

- State Water Resources Control Board
- Tomales Bay Agricultural Group
- Marin Horse Council (MHC)
- Western United Dairymen
- Mike Gale, rancher in Chileno Valley
- Corey S. Goodman, Ph.D.
- John Hulls
- Thomas G. Baty

Staff responses are as follows.

- 1) **We have revised the sources section to clarify sources of pathogens in the watershed.**
We assert that wildlife contributions are understood well enough to support our identification of sources and justify the required source control actions. Wildlife contributions come from warm-blooded animals that live on the land (terrestrial wildlife) and marine animals (birds, seals, etc.).

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Monitoring data downstream of dairies, grazing areas, equestrian facilities, homes with septic systems, and municipal runoff show coliform counts that are significantly higher than "pristine" watersheds with no human activity. During non-storm periods, Tomales Bay coliform levels are typically below the water quality targets, indicating that in-Bay wildlife such as seals and birds are not significant sources.

Terrestrial wildlife contributions

We have updated the Staff Report to include recent monitoring data that better illustrate terrestrial wildlife contributions. Approximately 30 percent of the lands draining to Tomales Bay are open space forested lands containing typical wildlife populations. Recent water quality monitoring in the Third Valley watershed in Inverness, a watershed on the western shoreline of Tomales Bay with minimal human influences, shows that tributary waters draining such areas are well below both water quality objectives and the revised tributary TMDL targets (See recent bacteriological monitoring data from 2004 and 2005 in Section 3.8 of the revised Staff Report). Based on these data we have excluded terrestrial wildlife as a significant source of pathogens.

Marine wildlife contributions

Based on data referenced in the Staff Report, we deduce that marine wildlife's contribution of pathogens is also not significant and is not causing exceedances of TMDL targets or water quality objectives. During non-storm periods, Tomales Bay coliform levels are typically below the water quality targets, indicating that in-Bay wildlife such as seals and birds are not significant sources (DHS, 2002; TBSTAC, 2000).

We propose modifying the Sources section of the Proposed Basin Plan Amendment as follows to further clarify our assessment of these sources:

SOURCES

If not properly managed, the following Tomales Bay Watershed sources categories have the potential to discharge pathogens to surface waters: faulty on-site sewage disposal systems (OSDSs), small wastewater treatment facilities and sewage holding ponds, boat discharges, grazing lands, dairies, equestrian facilities, and municipal runoff, and wildlife. Pathogens sources are identified based on elevated coliform bacteria levels downstream of identified land uses or facilities and from documentation of inadequately treated human waste discharges.

- The Walker Creek watershed is dominated by grazing lands. Coliform bacteria levels and coliform loads from the Walker Creek watershed are extremely high during storm periods and a significant coliform source to Tomales Bay.
- High coliform levels detected in storm drains indicate that municipal runoff is a pathogens source.
- High coliform levels and loads downstream of residential homes and equestrian facilities suggest that failing septic systems, municipal urban runoff, and equestrian facilities are coliform sources.
- The Water Board regulates ten small wastewater treatment facilities and sewage holding ponds and prohibits direct discharges from these facilities

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into Tomales Bay or its tributaries. Four facilities have holding ponds and are permitted to discharge treated effluent to irrigation fields in the dry season. The other six wastewater treatment facilities utilize leach fields for dispersing treated effluent. Accidental malfunctions, including the breaching of ponds, a break in a sewage line, or land application when soil is saturated or it is raining, could result in discharge of untreated or partially treated effluent. Therefore, these facilities are considered potential sources.

In addition to the above sources, warm-blooded mammals and birds that reside in the watershed and Bay produce coliform bacteria. During non-storm periods Tomales Bay coliform levels are typically below the water quality objectives for shellfish harvesting waters, indicating that in-Bay wildlife such as seals and birds are not significant sources. Approximately 30% of the lands draining to Tomales Bay are open space forested lands. Water quality monitoring of a watershed on the western shoreline of Tomales Bay with minimal human influences suggests that waters draining open space areas are below tributary bacteria water quality objectives and therefore terrestrial wildlife are not a significant source.

2) We have revised the tributary target and allocation for wildlife.

Staff recognizes, and agrees with commenters, that the previously proposed tributary target of 43 MPN fecal coliform/100 mL as an instantaneous maximum value was not attained at all times in the open space/wildlife portions of the watersheds and may in fact be over-protective of the tributaries' beneficial use (water contact recreation). As discussed in the "TMDL Targets and Load Allocations section" above, we propose raising the tributary target to 200 MPN fecal coliform/100 mL (the water quality objective to protect water contact recreational uses).

Further, in order to assure other source categories that they will not be held accountable for pathogens contributions from wildlife, the following language has been added to the Load Allocation section of the proposed Basin Plan Amendment:

Discharging entities will not be held responsible for uncontrollable coliform discharges originating from wildlife. If wildlife contributions are determined to be the cause of exceedances, the TMDL targets and allocation scheme will be revisited as part of the adaptive implementation program.

Additionally, we have revised both the "Load Allocation" section of the Staff Report and propose revisions to the Basin Plan Amendment document so that pathogen concentrations found in open space areas (background terrestrial wildlife contributions) are accounted for and included in the TMDL. The following language is included in the footnotes to the revised Table 4-22a of the Basin Plan Amendment document.

d.e. Although wildlife is Open space lands and the Bay contain wildlife and are therefore recognized as a potential source areas. it is These areas are not believed to be a significant source of pathogens and their contribution is considered natural background; therefore, no management measures are anticipated for this source required.

Source Identification and Allocation:

Several parties stated that the TMDL imposes undue requirements on some source categories because it fails to adequately identify, and fairly allocate loads to all of the pathogen sources within the watershed. These commenters believe that they are being held responsible for pathogen contributions from wildlife or other sources over which they have no control.

In this section we respond to the following commenters:

Tomales Bay Agricultural Group
Marin Horse Council (MHC)
Western United Dairymen
Mike Gale, rancher in Chileno Valley
East Shore Planning Group (ESPG)
Corey S. Goodman, Ph.D.
Thomas G. Baty

Staff responses are as follows.

We have revised the Sources section to clarify sources.

The TMDL identifies pathogen sources in the Tomales Bay watershed based on two types of information: elevated coliform bacteria levels (a class of bacteria commonly used to indicate the presence of pathogens) downstream of identified land uses or facilities, and documentation of inadequately treated human waste discharges. Identified sources include:

- Cattle grazing/agricultural uses in the Walker Creek watershed
- Municipal runoff (storm drains)
- Onsite sewage disposal systems (septic systems)
- Equestrian facilities
- Dairies
- Wastewater treatment facilities
- Wildlife (warm-blooded mammals and birds residing in the watershed and Tomales Bay)

We propose revising the Sources section as follows to clarify the scientific basis for identifying these sources:

SOURCES

If not properly managed, the following Tomales Bay Watershed sources categories have the potential to discharge pathogens to surface waters: faulty on-site sewage disposal systems (OSDSs), small wastewater treatment facilities and sewage holding ponds, boat discharges, grazing lands, dairies, equestrian facilities, and municipal runoff, and wildlife. Pathogen sources are identified based on elevated coliform bacteria levels downstream of identified land uses or facilities and from documentation of inadequately treated human waste discharges.

- The Walker Creek watershed is dominated by grazing lands. Coliform bacteria levels and coliform loads from the Walker Creek watershed are extremely high during storm periods and a significant coliform source to Tomales Bay.

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- High coliform levels detected in storm drains indicate that municipal runoff is a pathogens source.
- High coliform levels and loads downstream of residential homes and equestrian facilities suggest that failing septic systems, municipal urban runoff, and equestrian facilities are coliform sources.
- The Water Board regulates ten small wastewater treatment facilities and sewage holding ponds and prohibits direct discharges from these facilities into Tomales Bay or its tributaries. Four facilities have holding ponds and are permitted to discharge treated effluent to irrigation fields in the dry season. The other six wastewater treatment facilities utilize leach fields for dispersing treated effluent. Accidental malfunctions, including the breaching of ponds, a break in a sewage line, or land application when soil is saturated or it is raining, could result in discharge of untreated or partially treated effluent. Therefore, these facilities are considered potential sources.

In addition to the above sources, warm-blooded mammals and birds that reside in the watershed and Bay produce coliform bacteria. During non-storm periods Tomales Bay coliform levels are typically below the water quality objectives for shellfish harvesting waters, indicating that in-Bay wildlife such as seals and birds are not significant sources. Approximately 30% of the lands draining to Tomales Bay are open space forested lands. Water quality monitoring of a watershed on the western shoreline of Tomales Bay with minimal human influences suggests that waters draining open space areas are below tributary bacteria water quality objectives and therefore terrestrial wildlife are not a significant source.

Our proposed approach for reducing animal waste discharges and eliminating human waste discharges is not based on a prioritization scheme or any other method of ranking relative pathogen or bacteria contributions. Instead, all entities are required to eliminate or reduce waste discharges, independent of contributions from other sources categories. The Water Board does not intend to hold dischargers responsible for pathogen contributions that are beyond their control (e.g., from wildlife or sources other than their own source category). Therefore, even if it is determined that majority of pathogens are contributed by one source, the remaining sources will still be responsible for demonstrating that they are implementing reasonable and feasible management measures to prevent pathogen contribution within their control. It is important to note that waste management (which encompasses all pathogen pollution prevention actions) is required of all source categories with or without this TMDL. In other words, the TMDL does not set forth requirements for source categories that are not already called for by existing Federal and State policies and regulations. The TMDL process is a mechanism for clarifying these requirements.

Microbial Source Tracking (DNA Study):

Many parties commented that the Water Board should conduct Microbial Source Tracking (MST) or bacterial source tracking (BST) studies to better identify and distinguish among various pathogen sources (e.g., wildlife, human, and livestock). These commenters are:

Albert Straus, Blake's Landing Farms
Tomales Bay Agricultural Group
Marin Resource Conservation District

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Marin Horse Council (MHC)
East Shore Planning Group (ESPG)
County of Marin Environmental Health Services and Community Development Agency
Corey S. Goodman, Ph.D.

Staff responses are as follows.

As stated in the Source Identification and Allocation section above, we believe we have identified all actual and potential source categories of pathogens within the Tomales Bay watershed. We have crafted the TMDL so that entities are only responsible for addressing waste discharges associated with their own land use practices. No entity will be held responsible for wildlife discharges.

As for microbial source tracking (MST) techniques: These methods have some future promise for identification of microbial sources, and research continues to improve their accuracy and utility. However, they are still not fully developed and validated. In addition, they are expensive (costs range in the several hundreds of thousands dollars) and take a considerable amount of time (a few years) to complete. We have reviewed the recent literature on the current state of MST techniques, and our findings corroborate this position. A summary of this literature review is presented below.

A recent article by the United States Geological Survey (USGS), published in December of 2004, reports that:

Seven MST methods using *E. coli* to identify the sources of fecal contamination were less accurate in field application than previously reported.

The USGS-led study, done in cooperation with state and local government agencies and several universities and affiliated consultants, was among the first to test the accuracy of microbial source tracking methods against samples of known origin, called "challenge isolates." Scientists compared the accuracy of several source tracking tools in classifying *E. coli* strains to various sources (humans, dogs, gees, deer, horses, pigs, cows, and chicken).

When researchers sent *E. coli* challenge isolates for testing, many isolates either remained unclassified or were classified to incorrect sources. In all, fewer than 30 percent of challenge isolates were classified to the correct source-animal species by any method.

Prior source tracking research reports cite accuracy ranges from 60-90 percent for various source tracking methods. The authors of the USGS study attribute the discrepancy between the 60-90percent accuracy rates and the 20-30percent accuracy rates they reported to a number of factors:

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- Different bacteria may be present in animal guts in different seasons; in the USGS study, challenge isolates were collected 9 months after the reference feces were collected;
- There may be too many strains of *E. coli* bacteria in each animal species for effective application with small reference libraries, such as the 900 reference strains in the USGS study. At a cost of \$10 to \$100 to analyze one reference strain, however, building large source libraries gets expensive rather quickly;
- *E. coli* strains may not be truly specific to one animal source. Some *E. coli* strains have been found in more than one animal source, such as when animals live in close proximity with one another, though no evidence to support this premise was found in the U.S.GS study (USGS, 2004).

Results of another study, published in 2003 and conducted to evaluate MST methods using mixed fecal sources in aqueous test samples, maintain that:

No MST method that was tested predicted the source material in the blind samples perfectly. Host-specific PCR performed best at differentiating between human and non-human sources, but primers are not yet available for differentiating between all of the non-human sources. Virus and F+ coliphage methods reliably identified sewage, but were unable to identify fecal contamination from individual humans. Library-based isolate methods correctly identified the dominant source in most samples, but also had frequent false positives in which fecal sources not in the samples were incorrectly identified as being present (Griffith et al., 2003).

Yet another MST review article, published in 2004, concludes that:

Although there has been significant development of MST methods in recent years, no method has emerged as superior to others in terms of cost, and time restraints, simplicity and accuracy of distinguishing human and non-human sources of fecal pollution (Shah et al, 2004).

A review study of the MST methods conducted by the New Jersey Department of Environmental Protection and published in December of 2004, concludes that:

- All MST methods require further refinements. One of the biggest impediments to such development is the poor current understanding of microbial population genetics and host specificity.
- None of the methods take into account the change in composition of the microbial population from the intestinal to the environmental habitat
- Until MST techniques become standardized and validated, and because of the cost and time considerations involved in their use, it would be prudent to use MST methods sparingly and with understanding that the results need to be interpreted carefully. The use of MST methods may be warranted when ... thorough sanitary

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survey and spatially-intensive monitoring of the waterbody using standard quantitative fecal coliform indicator tests reveal no obvious or likely pollution source(s). (NJDEP, 2004).

The recently published Microbial Source Tracking Guide Document by U.S. EPA (June 2005) concludes that:

None of the Sources Identifiers (SI) currently used [in MST studies] meet the criteria for an ideal SI, including those that are indicator organisms recognized for regulatory uses.

The ecology and population biology of some source identifiers, particularly fecal coliforms/*E. coli*, are much better understood than that of others, such as the enterococci and *Bacteroides* spp. While the high genetic diversity of *E. coli* allows great discrimination between subtypes, it also complicates development of known source libraries.

The correlation of novel SIs such as *Bacteroides* with levels of conventional indicator organisms and/or with human health outcomes has not been determined, but should be if public health effects are under consideration (U.S. EPA, 2005).

Based on this review of the recent scientific literature as well as the issues stated in the Source Identification and Allocation responses section above, we maintain our previous assertion that pursuing MST studies prior to establishing this TMDL is not necessary.

Nonetheless, as stated in the Adaptive Implementation section of the Staff Report, the Water Board welcomes new information that may further the state of knowledge about pathogen sources and their relative contributions. At some point in the future we may support utilization of MST study results, if and when they are deemed to be adequately developed and validated.

Use of Indicator Bacteria

Three commenters questioned staff's use of indicator bacteria (fecal coliform) a surrogate for pathogens in the Tomales Bay watershed.

These comments were submitted by
Mike Gale, rancher in Chileno Valley
Tomales Bay Agricultural Group
Marin Resource Conservation District

Staff responds as follows:

Fecal coliform is an effective and universally accepted tool for determining whether human and animal waste is present in the water column. Unfortunately, the direct measurement of actual

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pathogens in the environment is impracticable due to factors such as high cost, time and equipment requirements, the need for highly skilled laboratory personnel, and other considerations. Based on the high levels of fecal coliform in the Tomales Bay watershed, we are confident in our strong recommendation to focus on preventing waste from entering waterbodies rather than actually measuring the precise number of pathogenic organisms present. Wastes from warm-blooded animals (including humans) contain nutrients and often contain pathogenic organisms as well as other potentially harmful constituents such as endocrine disruptors, further supporting the need to minimize all waste discharges.

Due to the diffused nature of the sources (nonpoint source runoff) and variability in pathogen loads as they relate to storm events, some uncertainty is expected. If future research provides a new indicator organism and/or a new, widely accepted analytical technique for detection and assessment of waterborne pathogens, this can be incorporated into the TMDL's adaptive management process.

In the second round of comments, two issues were of common concern to multiple parties:

- Requests for clarification of Table 4-22a in the proposed Basin Plan Amendment
- Requests that shellfish harvesting closures be based on creek flows rather than rainfall amounts

Request for clarification of Table 4-22a, Density-Based Pollutant Wasteload and Load Allocations for Dischargers of Pathogens in Tomales Bay

We received a number of comments on Table 4-22a. Commenters noted that this table, as revised, is not directly comparable to Table 4-20, which identifies coliform bacteria targets for Tomales Bay and its tributaries. They expressed confusion about the applicability and enforceability of the allocations. They suggested that some of the values in the table should be raised and that the table should either be deleted or the information presented in a narrative form. The following parties submitted comments on Table 4-22a:

Marin County Board of Supervisors
Marin Resource Conservation District
Western United Dairymen

Our responses to these comments are as follows:

In order to clarify the difference between targets and allocations we propose revising the first paragraph of the Load Allocations Section in the Basin Plan Amendment as follows:

TMDL targets are an interpretation of water quality standards, whereas TMDL allocations specify the amount (or concentration) of a pollutant that can be discharged to a waterbody such that standards are attained in both the receiving waterbody and all downstream waters. Table 4-22a presents density-based load allocations for Tomales Bay Watersheds watersheds pathogens source categories that implement tributary targets, and Table 4-22b presents allocations to specific major tributaries, where they discharge to Tomales Bay, and implement the Bay targets. Load allocations to the tributaries reflect the highest fecal coliform concentrations that can be discharged while still attaining and maintaining the Bay shellfish harvesting water quality objectives in the Bay. All

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entities in a watershed are responsible for meeting their source category allocation (Table 4-22a) and the applicable geographic-based allocations (Table 4-22b).

We concur with the statement that the targets, per se, are not enforceable. Only the Trackable Implementation Measures included in Table 4-23 are enforceable by the Water Board. We propose adding the following sentence to the allocations section to clarify this:

Responsible parties within each source category are required to implement the measures identified as specified in Table 4-23 by January 2009. The numeric targets and load allocations are not directly enforceable. For purpose of demonstrating attainment of applicable allocations, responsible parties will only be responsible for compliance with specified implementation measures and applicable waste discharge requirements or waiver conditions.

We understand the suggestion that Table 4-22a be deleted and/or presented differently to indicate that the commenters 1) do not wish to see allocations assigned to specific source categories, and 2) are concerned that assigning allocations increases the possibility that entities associated with a source category will be liable if they do not achieve their allocation.

Water Board staff hold to the view that TMDLs must allocate pollutant loads (or concentrations) to sources. Whether the information is presented in a tabular or narrative form, we do not support revising the information presented in Table 4-22a in a manner that fails to assign allocations to source categories. We have, however, added the clarifying language shown on the previous page (starting with "TMDL targets...") in an attempt to clarify the difference between allocations, targets, and liability/compliance considerations.

Our proposed revisions to the TMDL assign animal waste associated source categories that discharge to major tributaries an allocation of <200 MPN fecal coliforms/100mL and a joint watershed allocation of 95 MPN fecal coliforms/100mL (which needs to be met where Walker and Lagunitas Creeks discharge to the Bay). A performance goal for nonpoint sources of animal waste is to implement source control actions to reduce discharges to < 200 MPN fecal coliforms/100mL and to the level necessary to achieve 95 MPN fecal coliforms/100mL at the lower portion of the tributaries.

Adaptive implementation questions one and two and the monitoring program contained in the Basin Plan Amendment focus on helping us better understand how we can efficiently go about attaining the allocations, and the TMDL is set up to enable us to adapt, as necessary, to assure allocations will be attained. We expect that runoff from open space lands will dilute runoff from grazing lands and bring levels in the creek down from 200 MPN fecal coliforms/100mL to 95 fecal coliforms/100mL at the bottom of the watershed. In the Walker Creek Watershed more than 50 percent of the drainage area consists of open space. No actions are called for from open space lands that drain to the tributaries as the assumption is that during storm events coliform loads from open space lands are minimal. It is not unreasonable to assume that more than 50 percent of the water in a sample taken from Walker Creek at the Highway One Bridge during a storm is associated with open space runoff and groundwater. The amount of dilution provided

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by open space lands and the final load reductions that can be expected as a result of watershed-wide source control actions will be further evaluated in the course of the adaptive implementation program.

Base shellfish closures on creek flows rather than rainfall amounts

Three commenters suggested that due to the relatively small amount of runoff to creeks early in the rainy season, actual creek flows are a better indicator of fecal coliform contamination than rainfall amounts. These commenters are

- Marin County Board of Supervisors
- Marin Resource Conservation District
- Tomales Bay Shellfish Technical Advisory Committee

Staff agrees that stream flow volumes may be a better surrogate for closure guidelines than rainfall amount.

As the commenters noted, the Department of Health Services (DHS) is the agency responsible for modifying the closure guidelines. Water Board staff, DHS, and the Shellfish TAC are all committed to working together to improve the basis for closing shellfish beds. Question six in the adaptive management section of the Basin Plan Amendment raises the issue of the relationships among precipitation, runoff, tributary loads and shellfish harvesting closures. The proposed Basin Plan Amendment also includes the specific language below, encouraging the DHS to work in consultation with the Shellfish TAC to periodically evaluate shellfish closure rules and the relationship between precipitation and runoff.

The California Department of Health Services, working in consultation with the Shellfish Technical Advisory Committee, is encouraged to periodically evaluate, beginning in 2009, shellfish harvest closure guidelines and the relationship between precipitation, runoff, coliform levels, and water quality exceedances.

In their comment letter (see Appendix F), the Shellfish TAC offered to work with Water Board staff and DHS to "evaluate the existing shellfish closure rules based on rainfall and runoff data, as well as to explore efforts to revisit target and allocation levels for additional flexibility based on land uses and management practices in the watershed." We invite the RCD and other entities to join this effort.

**Part II: Staff responses to written comments
submitted in response to March 4,
2005 documents**

II. RESPONSES TO WRITTEN COMMENTS TO MARCH 4, 2005 DOCUMENTS

In this section and the next, Water Board staff responds to written comments not addressed in the previous section.

Comment Letter no. 1: Sierra Club Marin Group, Gordon Bennett, Chair

Comment 1.1: Mr. Bennett suggests that wildlife habitat be added to the list of beneficial uses that are adversely affected by pathogen pollution.

Staff concurs that wildlife, as well as humans, can be adversely affected by pathogen-related pollution. We have added the following language to the Basin Plan Amendment to reflect our agreement with this comment:

In addition to pathogens, animal and human waste contain nutrients that in excess-pose a threat to aquatic ecosystem beneficial uses. Tomales Bay, Walker Creek, and Lagunitas Creek are listed as impaired by excess nutrients. Human and animal wastes may also contain other harmful constituents such as steroids and pharmaceuticals. In addition to protecting the pathogen-impaired beneficial uses such as shellfish harvesting, water contact recreation, and non-contact water recreation, by eliminating the discharge of human waste and controlling the discharge of animal waste, this TMDL will also protect aquatic ecosystem beneficial uses such as marine habitat, estuarine habitat, cold and warm freshwater habitat, and wildlife habitat from other harmful constituents found in human and animal waste.

Comment 1.2: "The Clean Water Act does not define the background pathogens originating from wildlife as a 'discharge;' likewise the Basin Plan Table 4-23 properly [does] not list wildlife as a 'source,' therefore please [modify the proposed Basin Plan Amendment accordingly]."

TMDLs must identify all sources of pollutants, including background. Identification of a source as part of a TMDL is not the equivalent of naming a discharger under the Clean Water Act. The Sources section of the Basin Plan Amendment has been modified as follows to clarify our findings regarding wildlife as a pathogen source:

SOURCES

If not properly managed, the following Tomales Bay Watershed sources categories have the potential to discharge pathogens to surface waters: faulty on-site sewage disposal systems (OSDSs), small wastewater treatment facilities and sewage holding ponds, boat discharges, grazing lands, dairies, equestrian facilities, and municipal runoff, and wildlife. Pathogens sources are identified based on elevated coliform bacteria levels downstream of identified land uses or facilities and from documentation of inadequately treated human waste discharges.

- The Walker Creek watershed is dominated by grazing lands. Coliform bacteria levels and coliform loads from the Walker Creek watershed are

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extremely high during storm periods and a significant coliform source to Tomales Bay.

- High coliform levels detected in storm drains indicate that municipal runoff is a pathogens source.
- High coliform levels and loads downstream of residential homes and equestrian facilities suggest that failing septic systems, municipal urban runoff, and equestrian facilities are coliform sources.
- The Water Board regulates ten small wastewater treatment facilities and sewage holding ponds and prohibits direct discharges from these facilities into Tomales Bay or its tributaries. Four facilities have holding ponds and are permitted to discharge treated effluent to irrigation fields in the dry season. The other six wastewater treatment facilities utilize leach fields for dispersing treated effluent. Accidental malfunctions, including the breaching of ponds, a break in a sewage line, or land application when soil is saturated or it is raining, could result in discharge of untreated or partially treated effluent. Therefore, these facilities are considered potential sources.

In addition to the above sources, warm-blooded mammals and birds that reside in the watershed and Bay produce coliform bacteria. During non-storm periods Tomales Bay coliform levels are typically below the water quality objectives for shellfish harvesting waters, indicating that in-Bay wildlife such as seals and birds are not significant sources. Approximately 30% of the lands draining to Tomales Bay are open space forested lands. Water quality monitoring of a watershed on the western shoreline of Tomales Bay with minimal human influences suggests that waters draining open space areas are below tributary bacteria water quality objectives and therefore terrestrial wildlife are not a significant source.

Staff agrees that wildlife does not "discharge" pathogens in the same sense that man-made facilities do. We infer that the commenter wishes to modify Table 4-22, Density Based Pollutant Load Allocations for Discharges of Pathogens. This revised table (Table 22a) now provides an allocation for open space lands and In-Bay background and footnote (c) in Table 4-22a is modified to read as follows:

d.e. Although wildlife is Open space lands and the Bay contain wildlife and are therefore recognized as a potential source areas. These areas are not believed to be a significant source of pathogens and their contribution is considered natural background; therefore, no management measures are anticipated for this source required.

We further note that because the pathogen contribution from wildlife is considered to be part of the natural "background" contribution, wildlife is not viewed as a "discharger" under this TMDL.

Comment 1.3: The commenter is concerned that current monitoring shows essentially no basin-wide progress and that while responsible operators may improve practices to reduce pathogen sources, these gains may be offset by other less responsible (and unidentified) operators. He recommends that Table 4-23 be modified to include site-specific, sub-watershed specific and basin-wide progress reporting requirements.

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The Water Board will rely on documentation from each operator to track progress on site-specific implementation of pathogen reduction measures. This requirement has been clarified in Table 4-23.

Staff concurs that it will be useful to evaluate progress on a sub-watershed and basin-wide level. We have added the following language to the Evaluation and Monitoring section of the Basin Plan Amendment document:

In 2009 and approximately every five years after the adoption of the TMDL, the Water Board will evaluate site specific, sub-watershed specific, and watershed-wide compliance with the trackable implementation measures specified in Table 4-23.

Comment Letter no. 2: Mike Gale, Rancher in Chileno Valley

Comment 2.1: "I worry that our efforts to develop and sustain a profitable business will be threatened by closure if the target numbers are not met. I worry that our children will be discouraged from taking over our business because the threat of closure will always be over their heads. I worry that necessary improvements and repairs to infrastructure will be postponed because the uncertainty of the future will always be a concern."

We appreciate Mr. Gale's concern for the future, and we wish to reassure him and other ranchers and farmers in the area that the intention of this TMDL is absolutely NOT to threaten anyone's livelihood or the viability of his or her business. Please be aware that ranchers, and others whose activities are potential sources of pathogen, will not be held directly responsible for meeting the water quality targets. Instead, the TMDL requires all members of identified source categories to implement reasonable and feasible measures to reduce pathogen sources within their control. The implementation requirements contained in this TMDL are consistent with California's existing policy regarding nonpoint source pollution prevention. The TMDL implementation plan is intended to be sufficiently clear and detailed to provide a measure of certainty in how the Water Board intends to regulate pathogen sources in the future.

Comment 2.2: "The standards are designed to protect people swimming in our streams, but there are no swimmers, nor is the water deep enough to swim in."

The Basin Plan identifies water contact recreation as an existing use in the watershed. To protect this and other uses, the water contact recreation standard of 200 MPN fecal coliforms/100mL has been established for the tributaries. The Tomales Bay watershed is a significant recreational area that includes federal and state parks that attract many visitors. Maintaining water quality allows people to come into contact with the water without fear of acquiring a waterborne illness.

We recognize that some streams in the watershed are too shallow for swimming. However, many water recreational activities do take place in shallow water including wading, kayaking, and fishing. Walker Creek Ranch, a County-run educational center for children in the upper Walker Creek watershed, uses the creek year-round as an outside classroom for its science activities. In addition, fish surveys or water sampling, which also require contact with the water, occur throughout the watershed. These existing uses need protection.

Comment 2.3: "Unlike illness from human pathogens, no cases exist in which a person has gotten sick from water-borne pathogens originating from a cow."

The TMDL is designed to protect water quality and human health and prevent illness, rather than simply respond to an actual incidence of a cow-related human illness. Further, as stated in the U.S. EPA's Draft Implementation Guidance for Ambient Water Quality Criteria for Bacteria (US EPA, May 2002),

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“...based on the ability of warm-blooded animals to harbor and shed pathogens, U.S. EPA feels it is inappropriate to conclude that these sources present no risk to human health from waterborne pathogens. Consequently, states and tribes should not use broad exemptions from the bacteriological criteria for waters designed for primary contact recreation based on presumption that high levels of bacteria resulting from non-human fecal contamination present no risk to human health.”

Livestock (including cows) harbor and shed organisms that are pathogenic to humans; humans have gotten sick from bacteria present in cow manure. The most notable case occurred in 1999 in Washington County, New York where cow manure containing *E. Coli* O157:H7 infected a drinking water well. A three-year-old girl died and more than one thousand people became ill (Esch, 1999). This same bacteria has been detected in Tomales Bay (TBSTAC, 2000). The identification of pathogenic bacteria in a relatively small number of samples reinforces the public health concerns associated with the high level of fecal coliform observed in the Bay.

Waterborne pathogens that are known to be transmitted from cows to humans include *Cryptosporidium parvum*, *Giardia duodenalis*, *Campylobacter jejuni*, *Salmonella typhimurium*, and pathogenic strains of *E. coli* (Atwill, 1995).

In addition, discharges of animal waste to waters increase nutrient loadings (constituents for which this watershed is impaired) and may also introduce other harmful contributions such as steroids and pharmaceuticals.

Comment 2.4: “You are considering approving a new policy that could cost West Marin ranchers a great deal, and yet will not reach the proposed TMDL target. For many years we have been trying to improve water quality,...fencing cows out of creeks....[These] are not modest efforts.”

We believe that implementation of management practices, which may include fencing animals out of the waterways, livestock rotation through pastures, and installation of off-stream water troughs, will meet the TMDL allocation to ranchlands in West Marin. The costs incurred by each rancher will depend on current management practices and investments to date in water quality protection improvements including fencing, which we anticipate will be the most costly measure. Section 10.4 of the Staff Report estimates general costs for all responsible parties in the watershed.

If all reasonable and feasible actions have been undertaken and the target still is not attained, ranchers may petition the Water Board to re-evaluate targets and/or remove ranchers as a potential source category. The following language has been added to the Basin Plan Amendment to reflect this:

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If it is demonstrated that all reasonable and feasible source control measures have been implemented for a sufficient period of time and TMDL targets are still not being met, the Water Board will reevaluate water quality standards, TMDL targets and allocations as appropriate.

Comment 2.5: "What is the likelihood, based on real conditions, of the pollutant of concern living outside of its host, on the way to its potential human victim? What is the likelihood that this pollutant will reach its victim in the strength required for infection? What is the likelihood that potential human victims will be present in the creeks and the bay to receive the bacteria? If disease is likely from cows, why haven't our ranchers gotten sick?"

In developing a TMDL, we rely on water quality standards that U.S. EPA has developed using epidemiological studies and risk assessment analyses such as those suggested by Mr. Gale. The standards give us a benchmark to measure water quality that poses minimal threat to human health. The intent of this program is to prevent exposure to waterborne disease rather than wait for an outbreak and react.

Given the large number of ranches and the long span of time they have been operating in the Tomales Bay watershed, it is really not possible to know whether any rancher in the watershed has ever become ill from exposure to cow waste.

Comment 2.6: "What is the human cost of TMDL implementation? What will it mean to our way of life? Will West Marin cease to be an agricultural community? And will your TMDL forever change the character of our community, driving it away from productive agriculture?"

The intent of this TMDL is to restore and improve water quality in West Marin for the benefit of those who live and work there, visitors, and wildlife. In developing the TMDL, staff seeks to strike a balance between improving water quality and requiring implementation actions that are reasonable and feasible. "Human costs" should be offset by the human and societal benefits inherent in clean water and a sustainable environment.

This is not to say that monetary costs to every potential discharger (such as a rancher or a homeowner with a septic system) will be negligible. Homeowners with failing septic systems and ranchers whose cows range freely in creek beds will most likely incur expense in correcting conditions that threaten water quality. But there is no reason to expect that the agricultural character of the community will change as a result of this TMDL.

Comment 2.7: "What if the numbers don't go down?...Will this be a never-ending process, perhaps ending with the loss of all livestock?"

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The TMDL will promote implementation of practices proven to have water quality benefits. If all reasonable and feasible actions have been undertaken and the target still is not attained, ranchers may petition the Water Board to re-evaluate targets and/or remove ranchers as a potential source category.

Comment 2.8: "What assurances can the Water Board give us that, if we follow all of their recommendations we will be safe from legal recriminations?"

The TMDL requires source categories to implement reasonable and feasible measures to reduce pathogen sources.

Staff has modified the Basin Plan Amendment to include the following language regarding responsibilities of source categories:

This plan specifies required implementation measures (Table 4-23) for each of the source categories (Table 4-22). These implementation measures include evaluation of operating practices, development of comprehensive site-specific pathogens control measures and an plans, implementation schedule for such of site-specific-management measures, and submittal of progress reports documenting actions undertaken. Progress reports may be submitted directly to the Water Board or, if designated, through third parties. These progress reports will serve as documentation that source reduction measures are being implemented. While third parties may provide valuable assistance to TMDL implementation, the discharger is the entity responsible for complying with the specified regulations and regulatory controls. Responsible parties within each source category are required to implement the measures identified as specified in Table 4-23 by January 2009. The numeric targets and load allocations are not directly enforceable. For purpose of demonstrating attainment of applicable allocations, responsible parties will only be responsible for compliance with specified implementation measures and applicable waste discharge requirements or waiver conditions. Any further requirements would require Board action to revise those implementation measures.

Comment Letter no.3: Marin Agricultural Land Trust, Anthony Nelson, Stewardship Coordinator

Comment 3.1: "The Basin Plan amendment should include greater discussion of probable responses by the Water Board, including the allowable modifications to targets and allocations alluded to, and likely further actions required, or not, of landowners that are in compliance if in fact the targets are not met within the original timelines indicated."

Staff expects that implementation of the proposed TMDL requirements will be sufficient to reduce runoff and does not anticipate the need for additional requirements. To further address this concern we propose the following changes to the Evaluation and Monitoring Section of the Basin Plan Amendment:

EVALUATION AND MONITORING

Dischargers, stakeholders, and Water Board staff will conduct water quality monitoring to evaluate fecal coliform concentration trends in Tomales Bay and its tributaries. Five years after TMDL adoption, the Water Board will evaluate monitoring results and assess progress made toward attaining TMDL targets (Table 4-20) and load allocations (Table 4-22).

In 2009 and approximately every five years after the adoption of the TMDL, the Water Board will evaluate site specific, sub-watershed specific, and watershed-wide compliance with the trackable implementation measures specified in Table 4-23. In evaluating compliance with the trackable implementation measures, the Water Board will consider the level of participation of each source category as well as individual dischargers (as documented by Water Board staff or designated third parties).

~~Approximately every five years, the Water Board will determine if reasonable implementation progress has been made and if additional regulatory or enforcement actions are necessary. If a discharger demonstrates that all technically and economically feasible and cost effective source control measures implementation measures have been undertaken and or that it is infeasible to meet their allocation due to wildlife contributions, the Water Board will consider revising allocations as appropriate.~~ If source control actions are fully implemented throughout the Watershed and the TMDL targets are not met, the Water Board may consider re-evaluating or revising the TMDL and allocations. If, on the other hand, the required actions are not fully implemented, or are partially implemented, the Water Board may consider regulatory or enforcement action against parties or individual dischargers not in compliance.

Comment 3.2: "The proposed amendment reveals that the Tomales Bay Watershed TMDL is proceeding with significant gaps of knowledge in key areas such as pathogen ecology and relative source loading. It is reassuring that the TMDL, including targets and implementation plans, may be reviewed every five years for modification based on new information. However, with the exception of unspecified 'monitoring' activities there is no commitment in the amendment to begin closing the gap between necessary and available knowledge. Given that the cost of implementation is high and the likelihood of meeting the targets appears

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low, it seems important that the Water Board, and hopefully the Environmental Protection Agency, begin addressing the significant questions raised in the basin plan. A proactive approach to gathering information would allow Water Board staff to make defensible decisions and give greater confidence to source groups that they won't be in the same quandary five years from now."

Staff acknowledges that there are data gaps, but we assert that our understanding of the problem is sufficient to justify the actions proposed for the Basin Plan Amendment. Monitoring data downstream of grazing areas, equestrian facilities, homes with septic systems, and municipal runoff show coliform counts significantly higher than in watersheds with no human activity. Due to the nature of the sources (nonpoint source runoff) and the variability in pathogen loads related to storm events, uncertainty in the data is to be expected. We have revised the Basin Plan Amendment to better describe the water quality monitoring program and research needs. We assert that the Water Board has been and will continue to be proactive in conducting and supporting scientific studies.

Comment 3.3: "Requiring all implementation measures to be completed by January 2009 (3.5 years from now) is probably unrealistic, particularly for rural agricultural properties."

The requirements specified in Table 4-23 are consistent with the state's existing Nonpoint Source Guidelines for Rangelands and current requirements. We anticipate that additional time may be needed to implement all appropriate control measures. Table 4-23 has been modified to allow ranching and equestrian facilities to submit implementation schedules to the Water Board for our approval.

Comment 3.4: "Because of the costs of implementation and the uncertainty of future requirements and limitations, the proposed Basin Plan amendment is perceived to be a threat to continued agricultural uses in the watershed. It would be reassuring to include in the amendment a discussion of the economic and cultural importance of agriculture in the county and the watershed, and a desire by the Water Board to see agriculture remain viable while they carry out requirements of the Clean Water Act."

Staff concurs that agriculture is one of the primary land uses in the watershed and recognizes community support for agriculture. We have added to the Basin Plan the following language acknowledging the diverse and important human activities in the watershed:

This TMDL strives to achieve a balance such that allows human activities including agriculture, recreation, commercial fishing and aquaculture, and residential use to coexist and also restores and protects water quality-is restored and protected.

Comment 3.5: "The proposed Basin Plan amendment does not establish 'monitoring necessary to implement the TMDL' as it indicates.... If a detailed monitoring plan exists

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elsewhere it should be included or referenced in the amendment and be made available for comment. A scientifically valid monitoring plan reviewed by specialists is vital when embarking on an expensive, target-based program.

A detailed monitoring plan was released for public review on March 4, 2005. Please refer to Chapter Nine of the Staff Report. The proposed Basin Plan Amendment has been modified to add Table 4-25, which outlines the locations, constituents, sampling frequency, and the sampling entities for the long-term water quality monitoring program.

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Comment Letter no. 4: Marin Horse Council (MHC), Connie Berto

Comment 4.1: "Instead of partnering in tests to bring modern science to bear, the Board backs a plan which could cost up to \$73.5 million and not define, much less ensure solving, the problem."

Staff disagrees. We assert that we have defined the problem and the proposed solution is reasonable and feasible. Please keep in mind that many of the implementation actions are required by State and Federal laws and policies, regardless of this TMDL, and all are aimed at minimizing the discharge of animal and human waste to Waters of the State. As for partnering, the Water Board has been and will continue to be an active participant in the Tomales Bay Watershed Council and all technical committees. Over the last decade we have both supported and promoted the use of state and federal dollars to bring science to bear in the Tomales Bay watershed.

Comment 4.2: "The RWQCB... keeps quoting the US-EPA as setting target numbers, yet the US EPA Region 9 has stated that it does not set these numbers for water quality -- these are set by RWQCB."

Staff has not stated that U.S. EPA sets the targets. We propose the TMDL targets, which must be consistent with state and federal regulations and requirements and acceptable to the U.S. EPA, which must approve the TMDL before it takes effect.

Comment 4.3: "The MHC believes that is not acceptable to attempt to manipulate the agricultural community to achieve unrealistic and non-science-based goals. The equestrian community has research data on file to show that horse facilities have little to no impact on water quality....We have voluntarily established and promoted Best Management Practices in the area for over five years, including all major Marin County and Sonoma County stables. The MHC protests the inclusion of equestrian facilities in the threat of economic sanctions."

This TMDL is not an attempt to "manipulate" any community. The proposed TMDL requires all potential source categories of pathogens to manage their waste to the extent reasonable and feasible. Waste management is required irrespective of this TMDL.

As we have stated in the past, staff would be happy to review and consider the Horse Council's research data. To date we have not received any such data from the Horse Council.

We commend the Horse Council for "establishing and promoting best management practices." We encourage the Horse Council to document implementation of such practices and submit evidence of compliance to the Water Board for review. Alternatively, the Horse Council may prefer to work with the County of Marin's stormwater program.

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The proposed TMDL does not prescribe any economic sanctions. The TMDL requires all potential source categories to manage their waste to the extent reasonable and feasible. If management practices have already been fully implemented and animal waste from equestrian facilities is not being discharged, then no additional actions are necessary in addition to documentation of such efforts.

Comment Letter no. 5: Marin Resource Conservation District, Hank Corda, Chairman

Comment 5.1: "The proposed standard of 14 and 43 in five years may be unattainable, in spite of stringent management practices and innovative programs."

We do not expect targets to be attained in five years. The TMDL states that five years after its adoption the Water Board will evaluate monitoring results and assess progress towards attaining targets. We have revised Table 4-23 to clarify the timeframes associated with specific implementation actions. We also added the following language to the Adaptive Implementation Section to clarify actions the Water Board may undertake if targets are not met:

ADAPTIVE IMPLEMENTATION

Approximately every five years, the Water Board will review the Tomales Bay Watershed Pathogens TMDL and evaluate new and relevant information from monitoring, special studies, and scientific literature. The reviews will be coordinated through the Water Board's continuing planning program and will provide opportunities for stakeholder participation. Any necessary modifications to the targets, allocations, or implementation plan will be incorporated into the Basin Plan. In evaluating necessary modifications, the Water Board will favor actions that reduce sediment and nutrient loads, pollutants for which the Tomales Bay Watershed is also impaired. At a minimum, the following questions will be used to conduct the reviews. Additional questions will be developed in collaboration with stakeholders during each review.

...If it is demonstrated that all reasonable and feasible source control measures have been implemented for a sufficient period of time and TMDL targets are still not being met, the Water Board will reevaluate water quality standards, TMDL targets and allocations as appropriate. ~~Discharging entities will not be required to do more than what is considered reasonable and feasible.~~

Also, please see response to common concerns above for a discussion of revised targets ("standards").

Comment 5.2: "Potential sources of fecal bacteria are generally grouped into three major categories: human, livestock, or wildlife. Utilization of Bacterial Source Tracking (BST) [techniques]...would possibly prevent errors in determining the point and non-point source of the bacteria."

Sources of pathogens in Tomales Bay watershed are considered "nonpoint" sources except for municipal runoff from the Town of Pt. Reyes. Staff assumes what the commenter means by "determining the point and non-point source of the bacteria" is in fact determining various sources of bacteria (pathogens) and the geographic origin of such bacteria. Please see the Responses to Common Concerns, above, for our discussion of bacterial/microbial source tracking techniques.

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Comment 5.3: While current methodology for the two previous alternative segregation methods is costly, continued scientific advances in the procedures could lower the monitoring costs. Here is where the time constraints of the current plan could have the most devastational effect.

We propose adding flexibility to the timeline for implementation of management measures has added. The Basin Plan Amendment (see Table 4-23), has been modified to require equestrian facilities, grazing lands, and on-site wastewater disposal systems to submit schedules for implementation of their identified pollution reduction efforts. However, Water Board staff feel strongly that delaying implementation until new and less expensive testing methods are developed and validated is unjustifiable given the fact that Tomales Bay and Walker and Lagunitas creeks are impaired and there has already been one serious outbreak of waterborne disease (May 1998).

Comment 5.4: "Given the level of strong, local community support for agriculture, a statement should be provided within the document realizing the importance of sustainable agriculture in the watershed."

Staff concurs that agriculture is a primary land use in the watershed, and we recognize community support for agricultural activities in the Tomales Bay area. We have added the following language to the Basin Plan, acknowledging the diverse and important human activities in the watershed:

This TMDL strives to achieve a balance such that allows human activities including agriculture, recreation, commercial fishing and aquaculture, and residential use to coexist and also restores and protects water quality-is restored and protected.

Comment Letter no. 6: Albert Straus, Blake's Landing Farms

Comment 6.1: "The listing of Tomales Bay as impaired is not based on science."

The listing of a waterbody as impaired is based on policy and science as referenced in such policy. Tomales Bay's listing as an impaired water body is consistent with the federal guidelines for Clean Water Act Section 303(d), based on the following findings:

1. Tomales Bay exceeds (a) water quality objectives established by Water Board in the Basin Plan, and (b) shellfish criteria established by both the California Department of Health Services (DHS) and the U.S. Food and Drug Administration through the National Shellfish Sanitation Program. Since DHS rainfall closure rules are based on fecal coliform concentrations in water and shellfish, the number of days Tomales Bay is closed for harvesting is a estimate of the number of days fecal coliform concentrations exceed standards. In recent years, on average, Tomales Bay has been closed to harvesting approximately 70 days per year, and therefore it is assumed that fecal coliform standards are exceeded for approximately 70 days per year.
2. Under the Porter Cologne Water Quality Control Act, Chapter 24 Shellfish Protection Act of 1993(California Water Code, Division 7, Chapter 24, Section 14950-14958), Tomales Bay is considered threatened due to the above conditions.
3. DHS prohibits shellfish harvesting during periods of rainfall based on the results of bacteriological monitoring studies linking high coliform bacteria levels with rainfall events. Closure of the Bay to harvesting for approximately 70 days per year indicates that the beneficial use of shellfish harvesting is not currently being protected throughout the wet season.
4. A major outbreak of human illness, caused by consumption of Tomales Bay oysters contaminated with a pathogenic human virus, occurred during a dry weather period in May 1998. This indicates that the beneficial uses of the Bay are not adequately protected even in the absence of wet weather conditions.

Comment 6.2: "The conclusion that oysters were contaminated by the dairies or houses on the bay has no science behind it."

The TMDL draws no specific or definitive conclusions as to the source of contamination to the oyster beds. The Sources section of the Proposed Basin Plan Amendment has been revised as follows to clarify existing and potential sources and the basis for determining such sources:

SOURCES

If not properly managed, the following Tomales Bay Watershed sources categories have the potential to discharge pathogens to surface waters: faulty on-site sewage disposal systems (OSDSs), small wastewater treatment facilities

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and sewage holding ponds, boat discharges, grazing lands, dairies, equestrian facilities, and municipal runoff, and wildlife. Pathogens sources are identified based on elevated coliform bacteria levels downstream of identified land uses or facilities and from documentation of inadequately treated human waste discharges.

- The Walker Creek watershed is dominated by grazing lands. Coliform bacteria levels and coliform loads from the Walker Creek watershed are extremely high during storm periods and a significant coliform source to Tomales Bay.
- High coliform levels detected in storm drains indicate that municipal runoff is a pathogens source.
- High coliform levels and loads downstream of residential homes and equestrian facilities suggest that failing septic systems, municipal urban runoff, and equestrian facilities are coliform sources.
- The Water Board regulates ten small wastewater treatment facilities and sewage holding ponds and prohibits direct discharges from these facilities into Tomales Bay or its tributaries. Four facilities have holding ponds and are permitted to discharge treated effluent to irrigation fields in the dry season. The other six wastewater treatment facilities utilize leach fields for dispersing treated effluent. Accidental malfunctions, including the breaching of ponds, a break in a sewage line, or land application when soil is saturated or it is raining, could result in discharge of untreated or partially treated effluent. Therefore, these facilities are considered potential sources.

In addition to the above sources, warm-blooded mammals and birds that reside in the watershed and Bay produce coliform bacteria. During non-storm periods Tomales Bay coliform levels are typically below the water quality objectives for shellfish harvesting waters, indicating that in-Bay wildlife such as seals and birds are not significant sources. Approximately 30% of the lands draining to Tomales Bay are open space forested lands. Water quality monitoring of a watershed on the western shoreline of Tomales Bay with minimal human influences suggests that waters draining open space areas are below tributary bacteria water quality objectives and therefore terrestrial wildlife are not a significant source.

Comment 6.3: "Has SFB-RWQCB measured a difference in the quality of the water?"

Until very recently, there has been no long-term water quality monitoring program designed to assess trends in water quality over time in Tomales Bay watershed. In winter 2004 we initiated a program that aims to answer such questions. Within the next few years data we collect will be analyzed to determine whether and how much water quality improvement has been made. The Evaluation and Monitoring Section of the Proposed Basin Plan Amendment now provides more detail on the monitoring program and the types of questions it aims to address.

Comment 6.4: "A cooperative approach rather than a legislative and regulatory approach will work better for dairies along Tomales Bay."

In crafting the implementation plan, we have tried to build upon existing successful efforts to reduce pathogen discharges, while incorporating as much flexibility as possible into the plan.

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In addition, the TMDL encourages continued support of research, technical assistance, and funding programs to help foster and enhance existing cooperative efforts.

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Comment Letter no. 7, Tomales Bay Agricultural Group, Bob Giacomini, President; and Sharon Doughty, Secretary

Comment 7.1 : Actively carrying out the TMDL implementation plan will not provide sufficient protection from outside lawsuits if the water quality in tributaries does not meet targets.

We acknowledge your concern regarding vulnerability to lawsuits and have made several revisions to the proposed Basin Plan Amendment to clarify the requirements. Please keep in mind that the TMDL does not require "extra" measures beyond those required for compliance with existing waste management and water quality laws and regulations and a number of sources are not currently in compliance with the State's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program. Since the proposed targets are now consistent with existing water quality objectives, the TMDL does not increase liability. Compliance with implementation actions specified in the TMDL should provide more protection from third-party suits than currently exists, as the enforceable aspect of the TMDL lies with the implementation plan. In other words, a source in compliance with the implementation plan should not be vulnerable to a third-party lawsuit.

The following passages in the Proposed Basin Plan Amendment have been changed in response to this comment to:

Responsible parties within each source category are required to implement the measures identified as specified in Table 4-23 by January 2009. The numeric targets and load allocations are not directly enforceable. For purpose of demonstrating attainment of applicable allocations, responsible parties will only be responsible for compliance with specified implementation measures and applicable waste discharge requirements or waiver conditions. Any further requirements would require Board action to revise these implementation measures

Staff have also added the following language to the "Load Allocation" section of the Basin Plan Amendment:

Discharging entities will not be held responsible for uncontrollable coliform discharges originating from wildlife. If wildlife contributions are determined to be the cause of exceedances, the TMDL targets and allocation scheme will be revisited as part of the adaptive implementation program.

Comment 7.2 : Targets and load allocations "should be based upon what can be achieved in the Bay and tributary streams. Producers will be encouraged to participate in a program and policy that has realistic and attainable goals. The current criteria and load allocations are a disincentive to participate with efforts to improve water quality and the TMDL."

Staff has worked extensively with the agricultural community to develop an implementation plan with achievable goals. We hope that producers will find that improving water quality is a

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worthy cause and can demonstrate this by undertaking reasonable and feasible source control actions and working with us to demonstrate the benefits and limitations of such actions. The adaptive implementation plan is crafted so that this information can help inform the next round of decisions. The Tomales Bay Agricultural Group could also provide incentives for its members to participate in TMDL implementation, by taking responsibility for third-party monitoring for dairies. We welcome other suggestions for incentives for responsible manure management.

Comment 7.3: "...We welcome the flexibility [the implementation plan] provides.... In many cases, producers already have ranch water quality management plans and have been certified through the California Dairy Quality Assurance Program. In addition, all the dairies within the watershed have participated in SFRWQCB inspections to determine compliance with the Minimum Waste Discharge Guidelines."

We have tried to incorporate as much flexibility as possible into the implementation plan, and build upon existing successful efforts in crafting the plan. In addition, the TMDL also encourages continued support of research, technical assistance and funding programs to help foster and enhance existing cooperative efforts.

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Comment Letter no. 8: University of California Cooperative Extension, David Lewis, Watershed Management Advisor, Sonoma County

Comment 8.1: "It is critical that the RWQCB continue its monitoring program as described in the 2005 staff report."

Staff concurs. The Basin Plan Amendment now includes Table 4-25, "Baseline Water Quality Monitoring Program."

Comment 8.2: The commenter states that the tributary load allocation of 43 MPN fecal coliform/100 mL is unattainable. He presents data from selected "control" tributaries to illustrate this point.

Mr. Lewis presented data from three relatively pristine watersheds to support his statement that the previous allocation of 43 MPN/100mL in the tributaries is unattainable. Based on the data submitted, we agree. We propose revising the targets and allocations to a value that will protect beneficial uses and can be achieved in our background water quality stations. The discussion in the common concerns section relating to targets and allocations addresses this issue.

As Mr. Lewis explains in his letter, the data from the selected tributaries included both stormflow and baseflow sampling, but were somewhat biased toward stormflow events, which typically have elevated bacteria levels relative to baseflow. Even during storm events, only one of the identified "pristine" watersheds, "Milepost 36.17," significantly exceeded the revised allocations. Furthermore, data staff has collected from the relatively pristine "Inverness / Third Valley Stream" watershed, which was not presented in the comment letter, show levels significantly below the revised allocations. Because of the timing of when samples were collected, the data from "Milepost 36.17" is not representative of 30-day averaged background conditions throughout the Tomales Bay watershed. The revised tributary load allocations of 200 and 95 MPN fecal coliform/100 mL are attainable.

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Comment letter no. 9: Western United Dairymen, Paul E. Martin, Director of Environmental Services

Comment 9.1: "Baseline conditions of the watershed are not well understood....Study results from the 1995 and 1996 indicate that even watersheds without dairy or other agricultural activities have been unable to meet the standards set by the basin plan amendment."

The 1995-1996 study included both stormflow and baseflow sampling, but was somewhat biased toward stormflow events, which typically have elevated bacteria levels relative to baseflow. Even during storm events, only one of the identified "background" watersheds, "Milepost 36.17," significantly exceeded the revised allocations. Recent data staff has collected from the relatively pristine "Inverness / Third Valley Stream" watershed show levels significantly below the revised allocations. We therefore believe that the data from "Milepost 36.17" is not representative of 30-day averaged background conditions throughout the Tomales Bay watershed. The revised tributary load allocations of 200 and 95 MPN fecal coliform/100 mL are attainable.

Comment 9.2: "...If requirements are set so strictly that producers feel they have no hope of complying, effectively there will be no incentive or reason to even try, either now or in the future."

Staff has worked extensively with the agricultural community to develop an implementation plan with achievable goals. We hope that producers will find that improving water quality is a worthy cause and can demonstrate this by undertaking reasonable and feasible source control actions and working with us to demonstrate the benefits and limitations of such actions. The adaptive implementation plan is crafted so that this information can help inform the next round of decisions.

Comment 9.3: "Wintertime storm flows can be quite severe, and it does not appear the proposed amendment gives full recognition to this fact. Contact recreation is highly unlikely during winter storms, and this should be considered when establishing beneficial uses for the tributaries to the bay. Temporal and spatial conditions must be evaluated to accurately determine beneficial uses."

The Tomales Bay watershed is a significant recreational area that includes federal and state parks that attract many visitors. The Basin Plan identifies water contact recreation as an existing use in the watershed. To protect these uses, the water contact recreation standard of 200 MPN fecal coliform/100 mL has been established for the Bay and tributaries. Maintaining water quality allows people to enter the water without fear of acquiring a waterborne illness.

Staff recognizes that there are severe winter storms in the Tomales Bay watershed and that people are less likely to swim in the tributaries during a winter storm. However, other water recreational activities do take place in winter including swimming, kayaking, boating, windsurfing, and fishing. Walker Creek Ranch, a county-run educational center for children in

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the upper Walker Creek watershed, uses the creek year-round as an outside classroom for its science activities. In addition, fish surveys or water sampling, requiring water contact, may actually take place most frequently during storm events. These are all existing uses that need to be protected.

If information becomes available that demonstrates justification for a temporal or spatial target, it can be addressed as part of the adaptive management of the TMDL.

Comment 9.4: The Water Board should conduct further, site-specific research in Tomales Bay so that the TMDL is science-based and includes a reasonable implementation program.

As stated in the adaptive implementation section of the proposed Basin Plan Amendment, the TMDL can be modified to reflect new information or science as it becomes available. In addition, the Basin Plan Amendment includes language (page 14, Water Board Resource Allocation) directing planning resources toward evaluating new and relevant information from monitoring and scientific literature. This adaptive management approach also applies to the implementation plan, which can be modified as necessary. Furthermore, staff have revised the Evaluation and Monitoring and Adaptive Implementation actions to incorporate suggestions made by other commenters aimed at guiding future studies and monitoring efforts.

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Comment Letter no. 10: United States Department of the Interior, National Park Service, Don L. Neubacher, Superintendent, Point Reyes National Seashore

Comment 10.1: "Establish performance goals for BMP [Best Management Practices] design, rather than just implementation."

We recognize that the effectiveness of specific management measures will vary extensively depending upon a wide range of site-specific factors including slope, soils, vegetation, and operator performance yet, there is a need to establish clear goals related to such actions. The allocations will be viewed as water quality based performance goals. We will be seeking input on other appropriate goals in the process of developing conditions of waiving Waste Discharge Requirements for grazing lands. We welcome stakeholders and technical experts to participate in this process. The Water Board is committed to promoting studies to evaluate the effectiveness of source control measures and supporting and encouraging grant funding to promote best management practices such as those identified in Table 19 of the Staff Report.

Comment 10.2: "Address adaptive implementation associated with the sediment TMDL."

The Tomales Bay watershed has been identified as impaired for sediment in addition to pathogens. A future TMDL for sediment is anticipated. Fortunately for local dischargers, many of the identified sources of pathogens are also likely to contribute sediment, and integrating pathogen and sediment reduction efforts is an effective management strategy for both. Staff will continue to work to assure that implementation tools (such as water quality management plans) developed for the pathogen TMDL will be flexible enough to integrate smoothly with implementation requirements of a sediment TMDL.

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Comment letter no.11, US Environmental Protection Agency, David Smith, TMDL Team Leader

Comment 11.1: In 2004, U.S. EPA promulgated water quality standards for Designated Bathing Beach Waters, which apply to Tomales Bay based on the body contact recreation beneficial uses in effect. ("Water Quality Standards for Coastal and Great Lakes Recreation Waters" (69 FR 67217 et seq.; 40 CFR part 131.41). This rule requires a single sample maximum enterococci concentration of no more than 104/100mL, regardless of origin, "unless a sanitary survey shows that the source of the indicator bacteria are non-human and an epidemiological study shows that indicator densities are not indicative of human health risk.: Mr. Smith states that U.S. EPA believes "that the current targets for fecal coliform to protect the beneficial uses of shellfish harvesting in the Bay and the target for tributaries will be sufficient to achieve these federal standards because the fecal coliform standards for shellfish protection are roughly an order of magnitude more stringent than the standards set to protect body contact recreation." He recommends that the final staff report include a discussion on the applicable enterococci standards and the basis for concluding that the fecal coliform targets are sufficiently stringent to result in attainment of the enterococci levels.

The TMDL approach considers high fecal coliform levels to be indicative of a potential human health risk, consistent with U.S. EPA's policy statement.

Staff has added the following language to Section 3.4 of the Staff Report, discussing attainment of the enterococci standards through use of the fecal coliform targets:

On November 16, 2004, EPA promulgated a rule entitled, "Water Quality Standards for Coastal and Great Lakes Recreation Waters" (69 FR 67217 et seq.). This rule became effective December 16, 2004, and requires marine coastal waters (including estuarine waters) of California (except those covered by Los Angeles Basin Regional Water Quality Control Board) to achieve certain bacteria standards. This rule applies to Tomales Bay based on the designated water contact recreation beneficial uses in effect.

Based on this 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 of no more than 104 / 100 mL (75percent confidence level). 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.

This TMDL does not specifically address these recently promulgated and applicable water quality standards. However, we believe that the current fecal coliform targets for protecting the beneficial uses of shellfish harvesting in the Bay and water contact recreation in the tributaries are sufficient to achieve these 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. Therefore, staff concludes that the fecal coliform standards are sufficiently stringent to result in attainment of the

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enterococci standards and there would be no need to set a separate enterococci TMDL for Tomales Bay.

Comment 11.2: EPA recommends that the allocation section and Table 4-22 be clarified to state that any sources subject to future regulation through a NPDES permit program will be given wasteload allocations as defined in 40 CFR 130.2 (h).

Table 4-22 of the BPA has been modified to apply to future NPDES permits. The specific language is as follows:

Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.

Comment 11.3: "We support the Board's use of a concentration (density)-based approach to controlling sources of pathogens, rather than a load-based approach. Setting TMDLs for pathogens on a concentration basis is appropriate as the concentration of pathogens is generally of greater concern in the protection of shellfishing and recreation beneficial uses than mass loads of pathogens over time. This approach for pathogens TMDLs is consistent with our guidance (Protocol for Developing Pathogen TMDLs, U.S. EPA, 2001). This approach is also consistent with other pathogens TMDLs developed in other parts of California and in other states. The use of concentration-based targets ensure that the TMDL will attain and maintain applicable water quality standards for pathogens (which are also concentration-based) under different discharge and flow conditions.

Comment noted.

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Comment Letter no. 12: California Department of Health Services, Marc Commandatore, Environmental Scientist

Comment 12.1: "A concentration- (density-) based pathogen TMDL may not adequately protect the beneficial uses of Tomales Bay....DHS recommends that a load-based approach be incorporated into the implementation phase...[or] an explanation of the rationale for setting a concentration-based pathogen TMDL should be included in both the Basin Plan Amendment and the TMDL report."

Staff believes that a density-based TMDL is both appropriate for the Tomales Bay watershed and protective of its beneficial uses. Because exposure to pathogen densities determines the risk of waterborne illness, density is more directly related to public health risk than load and is therefore more protective of beneficial uses. As stated in Comment 11.3 above, U.S.EPA is in concurrence with staff's position.

While we continue to express the TMDL on a concentration basis, bacterial loading scenarios are addressed in the modeling analysis that accompanies the final Staff Report (see Section 7.2 of the Staff Report).

Comment 12.2: "The TMDL should be supported by a detailed explanation of the modeling, testing, and analysis required for calculation of a TMDL."

A description of the hydrodynamic pollutant transport model of Tomales Bay (developed by U.C. Berkeley) and its application to this TMDL has been incorporated by reference into the final Staff Report (see Section 7.2 of the Staff Report).

Comment 12.3: "The implementation procedures briefly outlined in the TMDL report and elaborated in the Implementation Plan should demonstrate that actual load reductions could be achieved."

The adaptive management section of the Basin Plan Amendment includes provisions for regular evaluation of the TMDL and stakeholder involvement in those reviews. If it is shown that source control actions are fully implemented throughout the watershed, then the Water Board may revise the TMDL allocation, implementation plan or desired load reductions. In working with stakeholders in the watershed, it is staff's intention that the implementation measures are reasonable and feasible and will help to support good stewardship of the land. The following language has been added:

If a discharger demonstrates that all ~~technically and economically feasible and cost effective source control measures~~ implementation measures have been undertaken and or that it is infeasible to meet their allocation due to wildlife contributions, the Water Board will consider revising allocations as appropriate. If source control actions are fully implemented throughout the Watershed and the TMDL targets are not met, the Water

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Board may consider re-evaluating or revising the TMDL and allocations. If, on the other hand, the required actions are not fully implemented, or are partially implemented, the Water Board may consider regulatory or enforcement action against parties or individual dischargers not in compliance.

Comment 12.4: Commenter suggests several specific considerations for TMDL development and implementation: Employ dilution models to determine if TMDL can be met under a variety of flow conditions; prioritize and sequence implementation actions based on severity of existing bacterial loading at specific locations; require "basic BMPs" such as cattle fencing and riparian buffer zones throughout the watershed; aggressively address septic system failures; monitor pollutant concentrations and loads in order to evaluate implementation effectiveness.

Hydrodynamic pollutant transport modeling has been employed to examine bacteria densities in the Bay under a variety of pathogen loading scenarios (see response to comment 12.2, above). The Basin Plan Amendment also includes a provision for monitoring implementation effectiveness. Regarding recommendations for specific implementation actions, many implementation actions are best identified on a site-specific basis. Rather than impose requirements for specific actions, the TMDL seeks to maximize flexibility and to allow individuals (or individual facilities) to identify management practices necessary to reduce pathogens. This is particularly true on agricultural lands where the slope, soil type and intensity of use determine most appropriate source control measures. The allocations should be viewed as water quality based performance goals for such implementation actions. For septic system repairs, the County has already employed a prioritization method (supported by your agency), which identifies those systems within 100 feet of a water body as highest priority.

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Comment Letter no. 13, State Water Resources Control Board, Ken Harris, Chief, TMDL Section

Comment 13.1: "The Source Identification paragraph of the amendment does not actually identify the sources affecting water quality. Therefore we must assume that the contributing sources have not been positively identified, and the various sources' contributions quantified."

The source section of the Basin Plan Amendment has been revised as follows to address this comment:

SOURCES

If not properly managed, the following Tomales Bay Watershed sources categories have the potential to discharge pathogens to surface waters: faulty on-site sewage disposal systems (OSDSs), small wastewater treatment facilities and sewage holding ponds, boat discharges, grazing lands, dairies, equestrian facilities, and municipal runoff, and wildlife. Pathogens sources are identified based on elevated coliform bacteria levels downstream of identified land uses or facilities and from documentation of inadequately treated human waste discharges.

- The Walker Creek watershed is dominated by grazing lands. Coliform bacteria levels and coliform loads from the Walker Creek watershed are extremely high during storm periods and a significant coliform source to Tomales Bay.
- High coliform levels detected in storm drains indicate that municipal runoff is a pathogens source.
- High coliform levels and loads downstream of residential homes and equestrian facilities suggest that failing septic systems, municipal urban runoff, and equestrian facilities are coliform sources.
- The Water Board regulates ten small wastewater treatment facilities and sewage holding ponds and prohibits direct discharges from these facilities into Tomales Bay or its tributaries. Four facilities have holding ponds and are permitted to discharge treated effluent to irrigation fields in the dry season. The other six wastewater treatment facilities utilize leach fields for dispersing treated effluent. Accidental malfunctions, including the breaching of ponds, a break in a sewage line, or land application when soil is saturated or it is raining, could result in discharge of untreated or partially treated effluent. Therefore, these facilities are considered potential sources.

In addition to the above sources, warm-blooded mammals and birds that reside in the watershed and Bay produce coliform bacteria. During non-storm periods Tomales Bay coliform levels are typically below the water quality objectives for shellfish harvesting waters, indicating that in-Bay wildlife such as seals and birds are not significant sources. Approximately 30% of the lands draining to Tomales Bay are open space forested lands. Water quality monitoring of a watershed on the western shoreline of Tomales Bay with minimal human influences suggests that waters draining open space areas are below tributary bacteria water quality objectives and therefore terrestrial wildlife are not a significant source.

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Comment 13.2: Maximum concentrations of fecal coliform allowed year-round, including during high flows.

To clarify the applicability of the allocations the Basin Plan Amendment has been revised as follows:

LOAD ALLOCATIONS

TMDL targets are an interpretation of water quality standards, whereas TMDL allocations specify the amount (or concentration) of a pollutant that can be discharged to a waterbody such that standards are attained in both the receiving waterbody and all downstream waters. Table 4-22a presents density-based load allocations for Tomales Bay Watersheds watersheds pathogens source categories that implement tributary targets, and Table 4-22b presents allocations to specific major tributaries, where they discharge to Tomales Bay, and implement the Bay targets. Load allocations to the tributaries reflect the highest fecal coliform concentrations that can be discharged while still attaining and maintaining the Bay shellfish harvesting water quality objectives in the Bay. All entities in a watershed are responsible for meeting their source category allocation (Table 4-22a) and the applicable geographic-based allocations (Table 4-22b).

Discharging entities will not be held responsible for uncontrollable coliform discharges originating from wildlife. If wildlife contributions are determined to be the cause of exceedances, the TMDL targets and allocation scheme will be revisited as part of the adaptive implementation program. The discharge of human waste is prohibited. All sources of human waste have an allocation of zero. Nonpoint source runoff containing coliform bacteria of animal and wildlife origin, at levels that do not result in exceedances of water objectives, does not constitute wastewater with particular characteristics of concern to beneficial uses. Therefore, animal- and wildlife-associated discharges, in compliance with the conditions of this TMDL, do not constitute a violation of applicable discharge prohibitions.

When all dischargers (i.e., individual facilities, property owners, etc.) associated with each source category meet the density-based allocation, the TMDL allocations will be achieved. Alternatively, when tributary waters meet the density-based allocation, the TMDL allocations will be achieved.

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Table 4-22a Density-Based Pollutant <u>Wasteload and Load Allocations</u>^{a,d} for Dischargers of Pathogens in Tomales Bay Watershed			
Categorical Pollutant Source	<u>Wasteload and Load Allocations</u> Fecal Coliform (MPN/100 mL)		
	For Direct Discharges to the Bay		For Discharges to Major Tomales Bay Tributaries
	Median^{ba}	90th percentile^{cb} Maximum	<u>Log Mean^b Single-Sample Maximum</u>
Onsite Sewage Disposal Systems	0	0	0
Small Wastewater Treatment Facilities	0	0	0
Boat Discharges	0	0	N/A
Grazing Lands (Ranchlands and Riparian Pasturelands)	≤14	≤43	43 <u>95</u> < 200
Dairies	≤14	≤43	43 <u>95</u> < 200
Equestrian Facilities	≤14	≤43	43 <u>95</u> < 200
Municipal Runoff	≤14	≤43	43 <u>95</u> < 200
<u>Wildlife^e</u> <u>Open space lands (terrestrial wildlife)</u>^d	≤14	≤43	43 <u>95</u> < 200
<u>In-Bay Background (marine wildlife)</u>^d	≤14	≤43	N/A

a. These allocations are applicable year-round. Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.

b. a. Based on a minimum of no less than five consecutive samples equally spaced over a 30-day period.

c. b. No more than 10% of total samples during any 30-day period may exceed this number.

d. e. Although wildlife is Open space lands and the Bay contain wildlife and are therefore recognized as a potential source areas, it is These areas are not believed to be a significant source of pathogens and their contribution is considered natural background; therefore, no management measures are anticipated for this source required.

d. These allocations are applicable year-round.

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TABLE 4-22B DENSITY-BASED POLLUTANT LOAD ALLOCATIONS FOR TOMALES BAY TRIBUTARIES	
<u>Tributary</u>	<u>Allocation Fecal Coliform (MPN/100 mL) Log Mean</u>
<u>Walker Creek at Highway 1 Bridge</u>	<u>95^a</u>
<u>Lagunitas Creek at Green Bridge</u>	<u>95^a</u>

a. Based on a minimum of five consecutive samples equally spaced over a 30-day period.

Comment 13.3: Load Allocations:

- a. **"The TMDL requires: 'Based on a minimum of no less than five samples equally spaced over a 30-day period.' (which translates to: every 6 days) which equals year-round monitoring. Unless these are perennial streams, recommend decreasing monitoring frequency in dry season and increasing it in wet season."**

The sampling frequency specified in Table 4-22a has been revised for consistency with the frequency specified in the Basin Plan as part of the water quality objective. Compliance with the allocations will be determined in the perennial streams (Walker Creek and Lagunitas Creek) in which the water contact recreation beneficial use takes place.

- b. **"The Load Allocations and Implementation Program for the small wastewater treatment facilities needs to be clarified by listing the names of these existing facilities, by stating that they discharge to land, and by stating whether or not any new facilities would be allowed and if so, under what conditions."**

Small wastewater treatment facilities, regulated by waste discharge requirements (WDRs), are prohibited from discharging directly to the Waters of the State. Therefore we are not legally required to specify them in the Basin Plan. If we were to specify all entities that have WDRs or waivers of WDRs, it would be necessary to update the Basin Plan frequently just to accommodate changes in the list of regulated facilities under WDRs.

Small wastewater treatment facilities presently operating in the watershed are identified by name in the Staff Report, Table 16.

- c. **"The staff report needs to explain why all of the small wastewater treatment facilities are not required to disinfect their effluent before discharging to ponds or the ground. Disinfection of ponded wastewater seems to be a logical requirement for control of fecal coliform from pond overflows or berm breaches."**

The Basin Plan has been modified as follows to include a discussion about applicable requirements for the small wastewater treatment facilities:

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The Water Board regulates ten small wastewater treatment facilities and sewage holding ponds and prohibits direct discharges from these facilities into Tomales Bay or its tributaries. Four facilities have holding ponds and are permitted to discharge treated effluent to irrigation fields in the dry season. The other six wastewater treatment facilities utilize leach fields for dispersing treated effluent. Accidental malfunctions, including the breaching of ponds, a break in a sewage line, or land application when soil is saturated or it is raining, could result in discharge of untreated or partially treated effluent. Therefore, these facilities are considered potential sources.

Regarding levels of treatment, for these facilities, currently, there are no statewide standards or requirements specifying level of treatment for WDR facilities or requiring disinfection. Instead, WDRs are determined on a site-specific basis. Staff concurs that if people are in proximity to where effluent is being discharged to land, it is advisable to disinfect prior to discharge. However, requiring disinfection of ponds is not advised, since bacteria present in ponds function as part of the treatment process and disinfection would eliminate this treatment capability.

All of the sewage treatment facilities in the Tomales Bay watershed are currently being inspected and evaluated for potential risk to water quality. This assessment of sewage treatment facilities is being conducted as part of the TMDL source evaluation and development process. Staff anticipates presenting the result of this assessment to the Water Board in summer 2006. As appropriate, we may recommend revisions to the WDRs.

d. **"Municipal runoff needs to be addressed through the Marin County stormwater permit."**

The title of Table 4-22 and footnote (d) have been changed to make it clear that the allocation for municipal runoff is a wasteload allocation because it is subject to a NPDES permit. In addition, Table 4-23 has been modified to clarify that the County's stormwater program is required to submit and implement a stormwater management plan as required under the applicable stormwater permit for small MS4s.

- e. **"Must clarify: for discharges to the bay, the TMDL lists a 'Maximum' allocation is 43 mpn/100 mL, but there is also a footnote to the 'Maximum' which states that up to 10% of the total samples in any 30-day period may exceed the 43 MPN. The allocation is either a Maximum or a 90 percentile limit, it cannot be both. (If 'Maximum' chosen, it would be a conservative interpretation of the objective, off-setting the lack of a margin of safety."**

Table 4-22 has been modified to be consistent.

Comment 13.4: "Monitoring See 4 a., above. No monitoring program is included in the amendment. Section 9.2 of the staff report needs to be added to the amendment in order for the Regional Water Board to be able to implement the monitoring program envisioned."

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The Basin Plan Amendment now includes a monitoring program that is consistent with the one presented in the Staff Report. See Table 4-25 of the Basin Plan Amendment.

Comment 13.5: "Margin of Safety – The first paragraph of this section is true if all sources are known and quantified, however according to the amendment they are not (see number 2, above); and if worst case conditions were known and accounted for in the staff report (e.g., minus tides, high runoff from a series of warm storms, and a dairy pond overflows/breaks), but they are not. See number 2, above; number 9, below; and also the (confusing) statement on pg. 37 of staff rpt: 'tributary waters receive very little to no dilution in the southern section of the Bay.' This statement in conjunction with the statement that Lagunitas/Olema subwatershed has the highest or second highest loadings (staff report pg. 24) (ranking is not clear in the discussion) indicates a need for an explicit margin of safety."

The portions of the comment pertaining to comment 13.2 above and comment 13.9 below have been addressed. In addition, the Margin of Safety discussion in the Staff Report has been modified as follows:

7.3 Margin of Safety

TMDLs are required to include a margin of safety to account for data uncertainty, critical conditions, and lack of knowledge. Because the load allocations in this TMDL are identical or more stringent than the existing numeric WQOs, which are established as protective standards and inclusive of all uncertainties (e.g., regrowth, die-off of fecal coliforms), the margin of safety is implicitly incorporated into the proposed TMDLs and load allocations.

Moreover, it should be noted that the analysis used to determine the load allocations is based on a number of conservative assumptions:

- In order to account for natural die-off of bacteria in the environment of the Bay, the model incorporated a conservative, first order bacterial decay coefficient of 0.02/hr (Brennan and Stacey, 2005c) which is a very conservative decay coefficient. A U.S. EPA review of bacterial decay coefficients in natural waters indicates that 0.02/hr is at the low end of values reported throughout the nation (U.S. EPA, 1985). Furthermore, bacterial disappearance rates observed in the 2000 TBSTAC report suggest much higher die-off rates.
- Modeling was based on steady state tributary bacterial densities. Actual densities tend to peak early in the runoff event and decline thereafter.
- Peak shellfish station bacterial densities are predicted during pulses of fresh water directly from Walker Creek. Shellfish tend to reduce or discontinue feeding during low salinity pulses.

These conservative assumptions incorporates additional implicit margin of safety into the proposed TMDLs and Load allocations. Therefore, staff asserts that no additional and/or explicit margin of safety is needed for this TMDL.

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Comment 13.6: "The first paragraph of the Implementation program should state the applicability of the existing Prohibition of Discharge to all the identified discharge sources. As the prohibition is the basis for the implementation program, that basis should be firmly stated, rather than left as presumptive."

The first paragraph of the implementation plan in the Basin Plan Amendment has been revised as follows:

The plan requires actions consistent with the California Water Code (CWC 13000 et seq.), the state's Nonpoint Source Pollution Control Program Plan (CWC Section 13369) and the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program,¹ and human waste discharge prohibitions (Prohibitions 5 and 15, Table 4-1).

In addition, the Basin Plan Amendment has been modified to clarify the TMDL target requiring zero discharge of human waste as follows:

In addition, no human waste (raw sewage or inadequately treated waste) shall be discharged to Tomales Bay or its tributaries. The no human waste discharge target is consistent with ~~the existing wastewater discharge~~ Discharge prohibitions Prohibitions 5 and 15, contained in Table 4-1.

Comment 13.7: "The Regional Board Attorney needs to include in the Administrative Record an interpretation of the current Prohibition of Discharge stating why any allocations may be allowed under the prohibition."

Discharge Prohibition no. 5 in Table 4-1 of the Basin Plan prohibits discharge of any wastewater which has particular characteristics of concern to beneficial uses to Tomales Bay...." The accompanying discussion states that Tomales Bay, Drakes Estero, Limantour Estero, Bolinas Lagoon, and Richardson Bay "have experienced high coliform, nutrient, and algal concentrations. This prohibition will provide protection for the intensive recreational beneficial uses of these water bodies."

The discussion does not imply that coliform, nutrients, and algae should be eliminated from these waters or that the Water Board intends to prohibit all discharges that contain these substances. Our 1975 Basin Plan, which is the earliest reference we have been able to locate pertaining to this prohibition, states in the agricultural runoff section (page 16-111) "Lands that have received animal wastes shall be managed to minimize erosion and runoff". There is no mention of the application of the discharge prohibition to agricultural lands. Another key to understanding this prohibition lies in the interpretation of the phrase "particular characteristics of concern to beneficial uses." Chapter 4 of the Basin Plan, in the section titled Discharge Prohibitions Applicable Throughout The Region (page 4-5), states,

¹ State Water Resources Control Board. 2004. *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Prevention Control Program.*

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"Prohibitions 1 through 5 refer to particular characteristics of concern to beneficial uses....This broad language has been and will be interpreted by the Regional Board on a case-by-case basis. It should be noted that the Regional Board will consider all discharges of treated sewage and other discharges where the treatment process is subject to upset to contain particular characteristics of concern unless the discharger can demonstrate that the discharge of inadequately treated waste will be reliably prevented."

We assert that nonpoint source runoff containing coliform bacteria of animal and wildlife origin, at levels that do not result in exceedances of water quality objectives, is not "wastewater with particular characteristics of concern to beneficial uses." We propose the following text addition to the Basin Plan Amendment to clarify this. We also propose adding a finding to the Board Resolution adopting the Basin Plan Amendment.

Discharging entities will not be held responsible for uncontrollable coliform discharges originating from wildlife. If wildlife contributions are determined to be the cause of exceedances, the TMDL targets and allocation scheme will be revisited as part of the adaptive implementation program. The discharge of human waste is prohibited. All sources of human waste have an allocation of zero. Nonpoint source runoff containing coliform bacteria of animal and wildlife origin, at levels that do not result in exceedances of water objectives, does not constitute wastewater with particular characteristics of concern to beneficial uses. Therefore, animal- and wildlife-associated discharges, in compliance with the conditions of this TMDL, do not constitute a violation of applicable discharge prohibitions.

Comment 13.8: "The Implementation Plan needs to be clarified and strengthened. As written in the amendment, the implementation program is not an enforceable program and is not acceptable. It consists of a series of task which identified implementing parties are presumed to complete without any oversight, and the first progress report is due on the same date as full compliance, January 2009. It does not make sense to have a progressive series of tasks due on the same date. Specific examples are given in the following two paragraphs, and in the edited Table 4-23, below. The implementation plan would be substantially improved if the implementation program laid out in the staff report was incorporated into the amendment along with compliance dates."

Staff appreciates that the reviewer prefers the expansive and detailed implementation plan referenced in the Staff Report. However, since the Basin Plan Amendment is by necessity a much more streamlined document, the implementation plan has been simplified as appropriate for inclusion in the Basin Plan.

We have modified Table 4-23 to incorporate many of the suggested changes identified in the underline and strikeout comments submitted by the reviewer. In particular, source categories are now required to submit plans, consistent with requirements necessary for Waste Discharge Requirements (WDRs), waiver of WDRs, or prohibition, to the Executive Officer or Water Board for approval. In addition, the timeframe for implementation of plans has been modified to allow

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source categories to submit implementation schedules for approval as well. This should allow for more measured oversight and progressive tasks.

Comment 13.9: "Septic systems implementation measures listed on Table 4-23, Trackable Implementation Measures, need task completion dates, and a requirement that the identified necessary repairs/upgrades be made. Table 4-24, Regulatory Framework' indicates that septic systems will be under a waiver. The amendment language need to state when the RB will act to adopt such a waiver, and what the requirements will include (e.g., require compliance with the TMDL) Similar clarifications need to be made for the other sources." Mr. Harris also provided recommendations on the types of changes needed to Table 4-23.

Staff has reviewed the suggested changes to Table 4-23 and clarified the task completion dates, required deliverables, and implementing parties. Regarding the comment on septic system (or OSDS) implementation measures, septic systems are already regulated by the County, acting under a Memorandum of Understanding (MOU) with the Water Board. As necessary this MOU or a waiver of WDRs can be updated or issued. Staff cannot predict exactly when the Water Board will act to adopt a waiver (or take any specific regulatory action) as this is up to the discretion and authority of the Board.

Comment 13.10: "One of the implementation measures for boat discharges includes recommendations for mooring exclusion zones, and enforcement procedures to ensure compliance with mooring exclusion areas. The staff report needs to address why mooring exclusion areas are necessary (to show that this is not an arbitrary requirement). Table 4-23 lists seven implementing parties to bring boats into compliance with the prohibition of discharge (Table 4-24), however boat owners, who are directly responsible for complying with the prohibition are not listed as an implementing party. It is not clear from Table 4-24 against whom the prohibition of discharge would be enforced."

Table 4-23 has been revised to make it clear that an evaluation of existing moorings and water quality impacts is necessary and should be included in the boating management plan. The reference to mooring exclusion zones has been removed. In addition, Table 4-23 has been modified to add boaters as an implementing party responsible for complying with the prohibition on discharge of human waste. There is also language in the Basin Plan Amendment clarifying that the discharger is the entity responsible for complying with the specified regulations and regulatory controls.

Comment 13.11: "The Basin Plan contains a prohibition of discharge of 'wastewater which has particular characteristics of concern to beneficial uses' (page 4-67, Table 4-1, item number 5). The amendment should specifically reference the prohibition (Table 4-1), and indicate what immediate enforcement action will be taken against boat owners, septic system owners and small wastewater treatment facilities for violations of this prohibition."

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The Basin Plan Amendment has been modified to specifically reference the existing prohibition of human waste discharge (contained in Table 4-1 of the Basin Plan, Nos. 5 and 15). However, staff is unable to specify what enforcement actions will be taken, as this is up to the discretion and authority of the Board and likely to vary according to the severity of violation.

Comment 13.12: "This amendment includes an agricultural water quality control program. The costs of the program and an identification of potential sources of financing must be included in the amendment in accordance with Water Code Section 13141. The costs of lost shellfish harvest days should be included in the costs estimate."

Staff concurs. The Basin Plan Amendment has been modified to include the following language:

AGRICULTURAL WATER QUALITY CONTROL PROGRAM COSTS

The implementation measures for grazing lands and dairies constitute an agricultural water quality control program and therefore, consistent with California Water Code requirements (Section 13141), the cost of the program is ~~specified~~ estimated herein. The total program implementation cost for these agricultural sources is estimated to range between \$900,000 – \$2 million per year over the next 10 years. The estimated cost will be shared by Tomales Bay watershed grazing lands operators (approximately 150). This estimate includes the cost of implementing animal waste control and grazing management measures and is based on costs associated with technical assistance and evaluation, installation of water troughs, and cattle control fencing along all streams. The program cost estimate may be high as it ~~does not~~ does not account for implementation actions already underway or areas that may not require ~~new~~ fencing. Besides fencing, other acceptable methods of managing livestock access to streams are not included in this cost estimate due to variability in costs and site specific applicability. Potential financing sources include federal and state water quality grants and federal agricultural grants.

The Water Code does not require us to include the cost of lost shellfish harvest days. Since we do not feel that these costs are a true reflection of the cost of a compromised beneficial use, we chose not to include them in the Basin Plan Amendment.

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Comment letter no 14: County of Marin Environmental Health Services, Philip Smith, Chief of EHS; and Alex Hinds, Director, Community Development Agency

Comment 14.1: The commenters recommend that the implementation schedule related to septic system repair and management be extended until 2015, with progress reviews in 2009 and 2012, in order to allow time for implementation of a county-wide program (now in development) and integration of requirements from AB 885 into county codes, regulations, and policies.

We propose modifying Table 4-23 to provide additional flexibility to the County to determine an appropriate implementation schedule. Specifically, the language has been modified as follows:

Table 4-23
Trackable Implementation Measures for the Tomales Bay Watershed Pathogens Total Maximum Daily Load[†]

Source Category	Action	Implementing Party	Completion Dates
On-Site Sewage Disposal Systems (OSDS)	<u>Submit to the Executive Officer for approval a plan and implementation schedule to evaluate OSDS performance for the Tomales Bay watershed and to bring identified OSDS up to County's repair standards. Establish a watershed wide management program that documents and assess performance of OSDS.</u>	Marin County, Community Development Agency	<u>January 2007</u>
	Develop management plan for meeting repair standards for all OSDSs that fail to pass inspection.	Marin County, Community Development Agency	
	Report progress on implementation of OSDS assessment <u>evaluation</u> and repair program.	Marin County, Community Development Agency	<u>Starting January 2011 and biennially thereafter</u>

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Comment Letter no. 15: East Shore Planning Group (ESPG), Paul Elmore, President

Comment 15.1: "The preservation of this magnificent watershed is largely due to the stewardship of our ranchers on the East Shore of Tomales Bay."

We are well aware that one of the primary land uses in the Tomales Bay watershed is agriculture, and we commend those ranchers who are setting an example of good stewardship. The following language has accordingly been added to the Basin Plan Amendment document:

This TMDL strives to achieve a balance such that allows human activities including agriculture, recreation, commercial fishing and aquaculture, and residential use to coexist and also restores and protects water quality is restored and protected.

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Comment Letter no. 16: Thomas G. Baty

Comment 16.1: "Implementation mechanisms may lack the teeth to affect the desired changes in behaviors that will be necessary to reduce pathogen levels in the bay. The effectiveness of the implementation plan depends on how regulatory staff chooses to interpret and enforce the 'trackable implementation measures.'"

The implementation plan included in the TMDL as Table 4-23 is consistent with Section 13242 of the California Water Code and includes a description of the nature of the actions necessary to achieve water quality objectives; a time schedule for the actions to be taken; and a description of the compliance monitoring and surveillance required to ensure successful implementation of the management practices. Based on specific input from staff at the State Water Resources Control Board, the implementation plan has been revised to clarify deadlines and required deliverables. Staff work within the bounds of the State Water Resources Control Board's enforcement policy; enforcement actions are taken at the discretion of the Board.

Comment 16.2: "The TMDL is...quite anthropocentric in its purpose and how it states the problem in the Basin Plan Amendment. It ignores how the human and animal waste responsible for pathogen loading can significantly impact the health of the natural ecosystem." Mr. Baty suggests that we include the following sentence in the Problem Statement: "Elevated pathogen levels should also be seen as indicative of significant risk to those listed beneficial uses protecting the natural resources (Cold Freshwater Habitat, Estuarine Habitat, Marine Habitat, Preserving Rare and Endangered Species, Fish Spawning, Wildlife, etc.)."

The problem statement in the proposed Basin Plan Amendment has been modified to include the following language:

In addition to pathogens, animal and human waste contain nutrients that ~~in excess~~ pose a threat to aquatic ecosystem beneficial uses. Tomales Bay, Walker Creek, and Lagunitas Creek are listed as impaired by excess nutrients. Human and animal wastes may also contain other harmful constituents such as steroids and pharmaceuticals. In addition to protecting the pathogen-impaired beneficial uses such as shellfish harvesting, water contact recreation, and non-contact water recreation, by eliminating the discharge of human waste and controlling the discharge of animal waste, this TMDL will also protect aquatic ecosystem beneficial uses such as marine habitat, estuarine habitat, cold and warm freshwater habitat, and wildlife habitat from other harmful constituents found in human and animal waste.

Comment 16.3: "Borello's sewage treatment facility is an antiquated series of sludge ponds. Without a prescribed residence time for either effluents or solids nor any sort of monitoring of pathogen levels, the material from these receiving ponds is simply spread on the surrounding hillsides...."

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The Borello sewage treatment facility is permitted under a Waste Discharge Requirement (WDR) Order No. 91-182, which was last updated in 1991. The facility treats waste (taken from residential septic tanks) through aeration and dispersal of the effluent to land, using spray irrigation. The existing WDR is based on Title 22 regulations (Title 22, Chapter 3, Article 1 of the California Administrative Code). These regulations originally allowed the use of primary treated wastewater—which is what is cited in the existing WDR. However, those Title 22 regulations have since been updated.

As part of the TMDL implementation plan, all of the sewage treatment facilities in the Tomales Bay watershed are currently being inspected and evaluated for their potential risk to water quality. Staff anticipates presenting the results of this assessment to the Board in summer 2006. As appropriate, we may recommend revisions to WDRs in the watershed, including the WDR for the Borello facility.

Comment 16.4: The operator has “stymied Board staff into an almost complete lack of oversight” of the Borello septage treatment facility. Specifically, “a 1997 Cleanup and Abatement Order (97-080) has stalled out, with little or no compliance with its directives.”

Staff disagrees. There has been increased oversight of the facility in the recent past. In particular, there have been an average of six inspections of the facility per year during the past three years. Compliance with the permit conditions has also improved significantly. Staff last assessed the facility in April 2005.

After reviewing the requirements included in the 1997 CAO, it appears that the operator may not be in full compliance. Specific elements suggesting lack of a full compliance include the following: sampling 100 ft. upstream and downstream in Millerton Creek from a designated station and reporting this sampling in each monthly Self Monitoring Report (SMR); analyzing the water balance and reporting the balance in each monthly SMR; providing a copy of all incoming septage records in each monthly SMR; monitoring well depth to groundwater and reporting it in each monthly SMR.

Elements in the CAO with which the facility is not fully in compliance will be evaluated along with the conditions in the WDR as part of staff’s review of all of the sewage treatment facilities in the watershed. At the conclusion of this watershed-wide assessment, we will recommend follow-up actions for new permit requirements, compliance monitoring, or enforcement actions, as appropriate.

Comment 16.5: “ As the septic component of the TMDL gathers momentum, there will be a greater need for a facility to receive and treat an increasing volume of septage....We do not have a true wastewater treatment facility that is available for our septic waste [and staff should] evaluate the options and...develop alternatives to the current choices for septic disposal that are not seasonally limited and provide adequate treatment.”

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It is outside of the scope of this TMDL to propose new facility construction or treatment options for septage disposal, and we are unaware of any studies that show that waste management capacity in the watershed is inadequate. Ensuring adequate treatment of waste is, however, within the Water Board's authority and responsibility. Water Board staff are currently in the process of evaluating all domestic wastewater treatment facilities within the Tomales Bay watershed in order to ensure the adequacy of their waste treatment processes. Water Board staff will continue to work with the County and other local efforts to evaluate and promote options for improving septage management.

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Comment Letter no. 17: Corey S. Goodman, Ph.D.

Comment 17.1: "Waters contaminated by fecal coliform from animals represent a lower risk to human health than when the coliform source is human."

Staff agrees with this statement. However, while animal waste may present a lower risk, it still poses a risk. Waterborne diseases that are known to be transmitted from cows to humans include (but are not limited to) *Cryptosporidium parvum*, *Giardia duodenalis*, *Campylobacter jejuni* and *Salmonella typhimurium*. As stated in the U.S. EPA's Draft Implementation Guidance for Ambient Water Quality Criteria for Bacteria (published in May 2002),

"...based on ability of warm-blooded animals to harbor and shed pathogens, U.S. EPA feels it is inappropriate to conclude that these sources present no risk to human health from waterborne pathogens. Consequently, states and tribes should not use broad exemptions from the bacteriological criteria for waters designed for primary contact recreation based on presumption that high levels of bacteria resulting from non-human fecal contamination present no risk to human health. "

In addition, discharges of animal waste to waters increase nutrient loadings (constituents for which this watershed is impaired) and may also introduce other harmful pollutants such as steroids and pharmaceuticals.

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Comment letter no. 18: John Hulls

Comment 18.1: "Nonpoint sources are inadequately described [in the TMDL]....The draft fails to note the potential for identifiable contributions from the large herds of elk and deer that populate watersheds that feed directly into Tomales Bay. Also, the existence of one of the larger populations of harbor seals in California, and the presence of large flocks of migratory birds represent discreet, identifiable potential sources of significance in the natural background."

Staff concurs that wildlife in Tomales Bay include deer and elk herds, seals and waterfowl and that they are a source of pathogens. It is also correct that the TMDL does not include a separate target or load allocation for each of the individual types of wildlife such as elk, seals or waterfowl.

However, our analysis of monitoring data has convinced us that wildlife is not a significant source of pathogens. We are fortunate, in the Tomales Bay watershed, to have both human-influenced and near-pristine tributary watersheds to compare in our monitoring studies. Our data show that the wildlife-only watersheds in the area do not exceed our proposed target of 200 MPN in the tributaries; only watersheds with human and agriculture-related sources do. Furthermore, many of the tributaries and sampling points in Tomales Bay meet the target during the dry season, even though wildlife are present in the Bay and tributaries year-round. These facts lead us to conclude that the rainy season runoff from watersheds with human and agriculture-related activities contribute the significant loads of coliform bacteria, not wildlife.

The following language has been added to the Sources section of the proposed Basin Plan Amendment to discuss the background contribution from wildlife and its effect on water quality targets:

...In addition to the above sources, warm-blooded mammals and birds that reside in the watershed and Bay produce coliform bacteria. During non-storm periods Tomales Bay coliform levels are typically below the water quality objectives for shellfish harvesting waters, indicating that in-Bay wildlife such as seals and birds are not significant sources. Approximately 30% of the lands draining to Tomales Bay are open space forested lands. Water quality monitoring of a watershed on the western shoreline of Tomales Bay with minimal human influences suggests that waters draining open space areas are below tributary bacteria water quality objectives and therefore terrestrial wildlife are not a significant source.

Comment 18.2: Mr. Hulls notes that U.S. EPA's Guidelines for reviewing TMDLs (under Existing Regulations issued in 1992) require both load and wasteload allocations.

We understand this comment to refer to Item 1 in the above-referenced U.S. EPA guidelines, which states, "Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background." We agree with this comment, and have modified Table 4-22 of the Basin Plan Amendment to include open space lands that

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contain wildlife as a categorical pollutant source. Lastly, while EPA does require that a TMDL include a load allocation for wildlife, it does not require that each wildlife type or species be assigned a separate allocation.

Comment 18.3: Mr. Hulls states that "the report is vague" in the area of "applicable water quality standards and numeric targets."

Water quality standards take into account both the beneficial uses and the numeric water quality objectives assigned to protect those uses. TMDL targets express the desired condition of the waterbody necessary to protect the beneficial uses. At a minimum, the TMDL targets must be consistent with applicable water quality objectives. In this TMDL, the targets have been revised so that the targets are the same as the water quality objective of 200 MPN fecal coliform/100 mL in the tributaries.

Comment 18.4: "...The report is essentially silent on any data that would allow a statistically valid link between the identified pollution sources and the target number."

A TMDL linkage analysis describes the relationship between the numeric targets and identified pollutant sources. Such "linkages" are not required to be mathematical. The entire TMDL Staff Report including the linkage analysis (Section 7) was reviewed by U.S. EPA and found to be sufficient and acceptable from their perspective. Also, see Comment 110.1 above.

Comment 18.5: "The report is silent on the volume or percent contribution of septic tanks, boaters, Ag runoff, and other sources."

It is correct that the TMDL does not specify pathogen load contributions from each source. Instead, the TMDL identifies the sources that we deem significant and causing impairment to water quality.

Comment 18.6: The EPA guidelines state that the TMDL "must identify the loading capacity of a water body for the applicant pollutant."

The TMDL does include a specific load allocation (or capacity) for each of the identified source categories. This load allocation is included in Table 4-22a of the Basin Plan Amendment. The loading or assimilative capacity is referred to as the "total maximum daily load" (TMDL), and this is included in Table 4-21 of the Basin Plan Amendment. Consistent with U.S. EPA guidance, allocations and TMDLs can be concentration- or mass-based. We have put forth concentration-based allocations.

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Comment 18.7: The EPA guidelines also state that a "TMDL submittal should describe the method used to establish the link between cause-and-effect relationship between the numeric target and the pollution source."

See response to Comment 18.4 above. The linkage analysis is contained in Chapter 7 of the Staff Report. Since the linkage analysis is not a regulatory provision, it is not included in the Basin Plan Amendment.

Comment 18.8: The TMDL report is deficient in that it doesn't "take into account critical conditions."

"Critical conditions" is a reference to EPA guidelines which state "TMDLs must take into account critical conditions for stream flow, loading, and water quality parameters as part of the analysis of loading capacity." This TMDL does account for all of those variables and includes a load allocation that protects the most sensitive water quality uses of the Bay, shellfish harvesting, during the most extreme storm (or stream flow) events. The analysis provided in Section 7.2 of the Staff Report evaluates the tributary load allocation that will meet water quality objectives for shellfish harvesting in the Bay and reduce the frequency of rainfall-triggered shellfish closures to no more than 30 days per calendar year. (See Responses to Common Concerns, above.)

Comment 18.9: The TMDL does not identify a loading capacity "attributed to existing and future nonpoint sources and to natural background"

The loading allowed for all sources, including existing, future, and background sources, is provided in Table 4-22a of the Basin Plan Amendment. Footnotes a and d have been added to Table 4-22a stating the following:

a. These allocations are applicable year-round. Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.

d.e. Although wildlife is Open space lands and the Bay contain wildlife and are therefore recognized as a potential source areas. it is These areas are not believed to be a significant source of pathogens and their contribution is considered natural background; therefore, no management measures are anticipated for this source required.

Comment 18.10: "The report does not seem to address future point sources...."

The discharge prohibitions make it unlikely that there will be future point sources permitted to discharge pathogens into Tomales Bay. Nonetheless, Table 4-22 of the Basin Plan Amendment has been modified to apply to future NPDES permits. The specific language is included in footnote a as follows:

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a. These allocations are applicable year-round. Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.

Comment 18.11: The TMDL report fails to meaningfully address “the statutory and regulatory required margin of safety” especially considering “the presence of such large quantities of contributory wildlife.

We disagree. The TMDL Staff Report includes a discussion on the margin of safety (see Section 6.4 of the Staff Report), which meets both regulatory and statutory requirements.

Comment 18.12: “The effects of seasonal variations are inadequately explored. Certain events such as the herring runs bringing in large numbers of harbor seals, migratory bird populations, large herds of elk sheltering from storms...are all ignored, nor are they correlated with the limited number of actual test performed.”

The Staff Report for the TMDL does discuss the influx of wildlife due to herring runs and movement of wildlife herds throughout the watershed (see Section 5.4). Currently, we have insufficient information to determine whether seasonal variations in wildlife behavior are significant enough to require modifications to the TMDL. Therefore, we have proposed the following question in the adaptive management section of the Basin Plan Amendment to consider the effect of seasonal variations in wildlife population in the future:

2. What are the pollutant loads for the various source categories (including naturally occurring background pathogen contributions and the contribution from open space lands), how have these loads changed over time, how do they vary seasonally, and how might source control measures be modified to improve load reduction?

Comment 18.13: “The presence of E-coli in sediment is a little known phenomena and the report is silent on the possibility that disturbance of stream sediment by increased velocity after rains may be a significant.”

Staff concurs that there is not yet definitive information on bacteria colonies residing in the sediment and their potential for contributing to fecal coliform loads during large storm events. If scientific evidence is provided in the future on this topic, we can incorporate it into the TMDL as part of the adaptive management process. We have added the following question to the adaptive management section of the TMDL regarding resident colonies of bacteria:

7. Are there bacteria in Tomales Bay sediments that enter the water column during storm events? If yes, how should this process be accounted for?

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Comment 18.14: Without load allocations, the Regional Water Quality Control Board "cannot possibly represent to EPA that there is reasonable assurance that source reductions...will result in attainment of the target standards."

Table 4-22 of the Basin Plan Amendment includes specific load allocations for Tomales Bay watershed pathogens sources. These allocations are concentration-based. All sources are required to undertake practices to ensure that discharges from their lands are below the concentration-based allocation.

Comment 18.15: Mr. Hulls states that although EPA does not require or approve implementation plans, "it does not provide any exemption from regulations."

An implementation plan is described in the Staff Report. Specific, trackable measures are prescribed in Table 4-23 of the Basin Plan Amendment.

Comment 18.16: Mr. Hulls states that because ranchers and other stakeholders have not been aware of EPA guidelines for evaluating TMDLs, "meaningful public participation" has not been possible. "EPA may defer its approval action until adequate public participation is provided for, either by the State/Tribe or EPA."

Water Board staff have been working closely with ranchers and stakeholders in the Tomales Bay watershed over the past several years, discussing this TMDL and other pollution prevention efforts in the watershed. We have participated in the Tomales Bay Watershed Council for over a decade and have conducted numerous public meetings in the watershed. We have met with every local entity or stakeholder who has asked to meet with us and publicly noticed a CEQA scoping meeting and release of TMDL reports in local newspapers. In addition, we have attended numerous Resource Conservation District meetings to discuss the TMDL. We assert that ranchers have had numerous opportunities to participate in development of this TMDL. EPA's guidelines for a TMDL (referencing Chapter 40 of the Code of Federal Regulations, Section 130 et. seq.) are described in section 2.1 of the Staff Report. This description of the TMDL process has been included as part of the public record for this TMDL.

Comment 18.17: "... Previously budgeted testing procedures are inadequate to meet the EPA requirements" In light of the extensive wildlife population in the Tomales Bay watershed."

It is unclear to staff what EPA requirements Mr. Hulls is referencing regarding testing procedures. EPA's public comment on this TMDL (see comment letter no. 11) contradicts the assumption that EPA will be dissatisfied with either testing procedures or the method in which the TMDL accounts for the wildlife population.

Appendix D. Staff Responses to Comments

Comment 18.18: The Water Board should “delay the acceptance of this plan, and revise where necessary until consensus is reached amongst the stakeholders that the scientific accuracy and procedures of all EPA regulations and guidelines and requirements for submission have been met.”

The people who enjoy Tomales Bay’s beneficial uses cannot wait for all stakeholders to reach consensus. Water Board staff have made significant efforts over the last several years to engage stakeholders in the TMDL development process, and we have modified the proposed Basin Plan Amendment in response to the concerns and comments of those stakeholders in ways that protect water quality and meet the legal requirements of a TMDL. U.S. EPA staff have reviewed the TMDL and found that it meets Federal requirements (see comment letter no. 11); therefore, staff believes that all “EPA regulations” have been met as well.

**Part III Staff responses to written comments
submitted in response to July 8, 2005
documents**

III. RESPONSES TO WRITTEN COMMENTS TO JULY 8, 2005 DOCUMENTS

Comment Letter no. 19; Marin Agricultural Land Trust, Anthony Nelson, Stewardship Coordinator

Comment 19.1: "Because it is unlikely that the TMDL targets and allocations be achieved, many landowners are concerned that they will face fines and lawsuits despite their best efforts to undertake appropriate management measures. To address this concern, the revised documents indicate that, to paraphrase your staff, 'Actions, not targets, are enforceable.' However, the language is inconsistent and a bit confusing on the subject...."

We have proposed the following language in the implementation plan section to clarify this point.

The numeric targets and load allocations are not directly enforceable. For purpose of demonstrating attainment of applicable allocations, responsible parties will only be responsible for compliance with specified implementation measures and applicable waste discharge requirements or waiver conditions.

"...Page 6 and 13 of the Amendment make the case that entities will only be responsible "for purpose of demonstrating attainment of applicable allocations"...by implementing reasonable and feasible management measures. Page 11 of the Amendment then adds the additional requirement to demonstrate that it is also 'infeasible to meet their allocation due to wildlife contributions....' Individuals cannot possibly meet this requirement and it should be deleted."

We propose modifying the text in the evaluation and monitoring section and inserting "or" rather than "and" as it relates to the Water Boards willingness to review and revise the TMDL, so that it reads:

If a discharger demonstrates that all ~~technically and economically feasible and cost effective source control measures~~ implementation measures have been undertaken ~~and~~ or that it is infeasible to meet their allocation due to wildlife contributions, the Water Board will consider revising allocations as appropriate.

"Pages 67 and 68 of the Staff Report contain language similar to pages 6 and 13 of the Amendment. However, text on page 59 of the Staff Report creates confusion by stating that 'it is the responsibility of individual facilities/property owners within a given source category to meet these allocations. In other words, individual facilities and property owners shall not discharge or release a "load" of pollution that will increase the density of fecal coliforms above the proposed load allocations assigned to that source type.' This ties responsibility directly back to allocation numbers rather than management measure implementation as stated elsewhere. In addition, the allocations and monitoring described (based on medians and percentiles) are not designed to assess a single pulse of pollutants. This paragraph on page 59-60 should be deleted.

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The goal and purpose of the implementation plan is for each discharger to meet their allocation by implementing source control actions. Allocations are essentially performance goals that should be used to identify appropriate source control actions. The Staff Report has been modified to be consistent with the proposed changes in text in the Basin Plan which states:

TMDL targets are an interpretation of water quality standards, whereas TMDL allocations specify the amount (or concentration) of a pollutant that can be discharged to a waterbody such that standards are attained in both the receiving waterbody and all downstream waters. Table 4-22a presents density-based load allocations for Tomales Bay Watersheds watersheds pathogens source categories that implement tributary targets, and Table 4-22b presents allocations to specific major tributaries, where they discharge to Tomales Bay, and implement the Bay targets. Load allocations to the tributaries reflect the highest fecal coliform concentrations that can be discharged while still attaining and maintaining the Bay shellfish harvesting water quality objectives in the Bay. All entities in a watershed are responsible for meeting their source category allocation (Table 4-22a) and the applicable geographic-based allocations (Table 4-22b).

The monitoring program is set up to evaluate attainment of targets and assess effectiveness of implementation actions on a watershed-wide scale. It is not intended to assess a single pulse of pollutants. Monitoring to detect a single pulse or discharge from a specific facility may be required as part of a Water Board issued permit, but is not required specifically by this TMDL.

Comment 19.2: "Page 10 of the Amendment (Agricultural Water Quality Control Program Costs) provides that cost estimates to implement measures on grazing lands include 'fencing along all streams.' Appropriate management of rangeland water quality depends on a host of site-specific criteria such as topography, accessibility, vegetation present, and livestock operations. While it is often an important facet of stream management, fencing is neither useful nor necessary along every stretch of waterway. It can, in fact, be counterproductive as it alters livestock behavior and can limit wildlife movement and predator-prey relationships. In many cases, management measures other than fencing can provide the desired goals, and it is inappropriate to assume or require complete fencing of every stream in the County. The sentence on page ten of the Amendment should be re-stated as 'The program cost estimate may be high as it does not account for implementation actions already underway or areas that may not require fencing.'"

The sentence in the agricultural water quality control program section of the Amendment has been revised as follows.

This estimate includes the cost of implementing animal waste control and grazing management measures and is based on costs associated with technical assistance and evaluation, installation of water troughs, and cattle control fencing along all streams. The program cost estimate may be high as it does not account for implementation actions already underway or areas that may not require new fencing. Besides fencing, other acceptable methods of managing livestock access to streams are not included in this cost estimate due to variability in costs and site specific applicability.

Comment 19.3: "Pages one and two of the Amendment refer to a Table 3-1 that is not found in either of the revised documents and is not referenced to any other document."

Table 3-1 is an existing Table in the current version of the San Francisco Bay Water Quality Control Plan (Basin Plan). When the proposed Basin Plan Amendment is adopted, it will be inserted into the same existing Basin Plan document. Therefore, no additional reference is needed.

Appendix D. Staff Responses to Comments

Comment Letter no. 20; Marin Resource Conservation District, Hank Corda, Chairman

Comment 20.1: The language on Page 6 of the implementation plan which requires compliance with applicable waste discharge requirements should be stricken.

California's State Water Resources Control Board's *Nonpoint Source (NPS) Pollution Implementation and Enforcement Policy* of May 2004 specifically requires all identified sources to be regulated through either individual Waste Discharge Requirements (WDRs), waiver of WDRs, prohibition, or combination. To comply with this policy, the TMDL proposes waiver of WDRs for grazing lands. Waiver conditions will be developed over time and in consultation with stakeholders in the watershed. To meet the conditions of the TMDL, it is necessary to meet the conditions of applicable WDRs or waivers. Therefore, this language cannot be removed.

Comment 20.2: Referring to Table 4-23, Mr. Corda states that "grazing lands" should be clearly defined and the description of Reports of Waste Discharge (ROWD) should state whether fees are required and whether submittals are formal or informal.

We intend to use the Board's waiver program for dairies as a template for establishing the grazing lands waste discharge requirements waiver program, and to work with the stakeholders to develop a working definition of "grazing lands," a term that is now not officially defined. We invite the RCD to work with us and help answer the questions you raise.

Currently there is no statewide fee schedule for waivers of WDRs. The State Water Board can approve establishing fees if resource demands for overseeing a waiver program warrant funding. Any such fees will be considered in a public hearing and the RCD can provide input at that time.

Comment 20.3: (Referencing page 10, Agricultural Water Quality Control Program Costs) "Please clarify which streams should be fenced and how they are to be managed."

Please note that this section of the Basin Plan Amendment is a summary of the cost estimates contained in Chapter 9 of the Staff Report. These are not requirements or implementation measures. If the Basin Plan Amendment is approved by the Water Board, each landowner will be responsible for assessing his or her own property and identifying appropriate, site-specific management measures to reduce animal waste runoff.

Comment 20.4: "What is the bay's baseline fecal coliform level?...There may be variability in the bay's baseline water quality where wildlife may have some influence on what is attainable. Please include information that will provide us with knowledge of background water quality levels in the bay."

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This information is already provided in the Staff Report, and we are including it below. The latest triennial sanitary survey report for Tomales Bay, conducted by California Department of Health Services in 2001-2003, provides the following baseline data for the Bay. These data, summarized in the following table, were collected during the open shellfish harvest periods (when the Bay water quality was not being affected by runoff from the watershed lands) and is a good representation of In-Bay baseline fecal coliform levels contributed by wildlife.

Summary of fecal coliform data (MPN/100 mL) for the certified shellfish growing areas in Tomales Bay from May 1, 2000 to April 1, 2003				
Sample Site	Number Of Samples	Geometric Mean 2003	Geometric Mean 2002	Geometric Mean 2001
WQ Station # 1	30	3.4	3.9	3.3
WQ Station # 2	30	3.8	3.3	4.5
WQ Station # 4	30	2.4	2.7	2.7
WQ Station # 6	30	2.6	2.9	4.3
WQ Station # 7	30	2.5	2.9	3.5
WQ Station # 9	30	4.8	4.1	4.4
WQ Station # 10	30	4.3	3.7	4.2
WQ Station # 11	30	4.4	4.3	5.6
WQ Station # 12	30	2.4	2.4	2.8
WQ Station # 31	30	4.0	4.1	3.9
WQ Station # 32	30	3.7	4.7	5.5
WQ Station # 33	30	3.1	3.1	3.3
WQ Station # 38	30	2.7	2.9	3.4
WQ Station # 39	30	2.9	3.8	3.8
WQ Station # 40	30	4.1	4.7	4.0
WQ Station # 41	30	5.0	5.1	3.8
WQ Station # 47	30	5.1	5.1	3.5

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Comment Letter no. 21: Tomales Bay Shellfish Technical Advisory Committee, Dale Hopkins, Chair

Comment 21.1: "We realize that there are many unresolved issues in this TMDL that are expected to be addressed in the adaptive management process, [including] uncertainty surrounding the attainability of targets and allocations; [and the] need for further clarification regarding a waiver program for grazing lands and equestrian facilities."

We agree, and we look forward to working with TBSTAC and other stakeholders in the watershed to resolve these issues.

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Comment Letter no. 22: Western United Dairymen, Michael L.H. Marsh, CEO

Comment 22.1: "Western United Dairymen has stated in previous comments that we believe defining 'contact recreation' as a beneficial use of tributaries should be reconsidered. Contact recreation is not an option in winter storm flows and it does not ever occur on the minor tributaries. The Basin Plan does in fact recognize that contact recreation is not on the minor tributaries; therefore, the TMDL and Basin Plan are inconsistent.

We disagree with Mr. Marsh that the TMDL and the Basin Plan are inconsistent. While the Basin Plan does not specifically identify all minor tributaries of Tomales Bay, it does state on Page 2-5 that the beneficial uses of any specifically identified water body generally apply to all of its tributaries. The Basin Plan designates water contact recreation an existing or potential beneficial use of Walker and Lagunitas Creeks.

Comment 22.2: "The watershed baseline condition for fecal coliform has not been well established....We cannot depend on west shore results to be a surrogate for east shore background conditions....More sites need to be evaluated, including sites on the east shore."

We agree that additional sites could provide more information on spatial and temporal variability in background levels. However, we assert that the existing data set is sufficient to establish sources and justify the regulatory requirements set forth in the Basin Plan Amendment. Note that Table 4-25 indicates that both east and west shore tributaries will be monitored. Adaptive implementation question no. 2 identifies the need to better assess background and wildlife contributions.

Comment 22.3: "We recommend replacing the term 'cattle control fencing along all streams' with 'management of livestock access.'

Staff agrees with Mr. Marsh that control fencing is only one method of managing livestock access to streams. Therefore, we propose the following change to the Basin Plan Amendment language in the Agricultural Water Quality Control Program cost analysis section:

The program cost estimate may be high as it ~~does not~~ does not account for implementation actions already underway or areas that may not require ~~now~~-fencing. Besides fencing, other acceptable methods of managing livestock access to streams are not included in this cost estimate due to variability in costs and site specific applicability. Potential financing sources include federal and state water quality grants and federal agricultural grants.

Comment 22.4: Mr. Marsh states that his association "believes that the current Report of Waste Discharge (Form 200) should be modified to provide better information....We would appreciate some assurances that the Regional Board will work with Western United

Appendix D. Staff Responses to Comments

Dairymen and others in the agriculture community to develop an improved reporting form that is consistent with similar reporting forms of other agencies.”

Water Board staff is committed to working with the agricultural community to develop a fair and effective waiver program for agricultural facilities covered under this TMDL. We propose the following text changes to the Basin Plan Amendment to clarify the timeline for this effort and deliverables.:

The Water Board ~~currently has a policy establishing established~~ conditions for waiving WDRs for dairies. The Water Board intends to work with stakeholders to develop similar waiver ~~policies~~ conditions for grazing lands and equestrian facilities by 2009.

In addition, a footnote has been added to Table 4-23 explaining the Water Board’s discretion in requiring forms other than an ROWD for meeting requirements of a waiver.

WDRs waiver conditions may allow for other submittals in lieu of a Report of Waste Discharge.

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Comment Letter no. 23; United States Environmental Protection Agency, David Smith, TMDL Team Leader and Diane E. Fleck, Esq.

Comment 23.1: We have concluded that the TMDL meets all federal requirements and will be approvable upon submission to EPA.

Comment noted. See the letter, in Appendix F, for further clarification.

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Comment Letter no. 24; The Board of Supervisors of Marin County, Hal Brown, President

Comment 24.1: "We...suggest that you modify the new language in the second paragraph of page 6 to further protect ranchers and dairies by adding the following language to the end of that paragraph: 'We recognize that these goals for dairies and grazing lands are high. Exceedance of these goals for more than thirty days in a calendar year shall not constitute grounds for an enforcement action. An enforcement action may only be brought by the Water Board.'"

Based on the reference to the 30 days per year, we assume the commenter is referring to the TMDL target relating to shellfish closure days.

As stated in the Basin Plan Amendment, TMDL targets and allocations are not directly enforceable; the only enforceable provisions relate to compliance with specified implementation plan requirements.

As for your suggestion of adding text limiting enforcement action to the Water Board, it is not appropriate for us to write a Basin Plan Amendment in a way that could be construed as an attempt to limit rights that may be granted to any citizen under federal and state laws. Nonetheless, we propose adding the following text to the Basin Plan Amendment to clearly state the Water Board's position on enforcement.

The numeric targets and load allocations are not directly enforceable. For purpose of demonstrating attainment of applicable allocations, responsible parties will only be responsible for compliance with specified implementation measures and applicable waste discharge requirements or waiver conditions.

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Comment Letter no. 25; State Water Resources Control Board, Joanne Cox

Comment 25.1: Wildlife should be included in the sources of coliform and should be given a Wildlife/Background Allocation.

Please refer to the overview discussion regarding wildlife as a potential source of pathogens. The wildlife contribution from terrestrial wildlife is included in the Open Space lands category, to which we have assigned an allocation of 200. Marine mammals and waterfowl are discussed under the sources section but are not considered a significant source. In response to your request to give marine wildlife an allocation, we propose revising the allocations table as follows:

Table 4-22a Density-Based Pollutant <u>Wasteload and Load Allocations</u>^{2d} for Dischargers of Pathogens in Tomales Bay Watershed			
Categorical Pollutant Source	<u>Wasteload and Load Allocations</u> Fecal Coliform (MPN/100 mL)		
	For Direct Discharges to the Bay		For Discharges to Major Tomales Bay Tributaries
	Median^{ba}	90th percentile^{cb} Maximum	Log Mean^b Single- Sample Maximum
Onsite Sewage Disposal Systems	0	0	0
Small Wastewater Treatment Facilities	0	0	0
Boat Discharges	0	0	N/A
Grazing Lands (Ranchlands and Riparian Pasturelands)	≤14	≤43	43 <u>95</u> < 200
Dairies	≤14	≤43	43 <u>95</u> < 200
Equestrian Facilities	≤14	≤43	43 <u>95</u> < 200
Municipal Runoff	≤14	≤43	43 <u>95</u> < 200
Wildlife^e Open space lands (terrestrial wildlife)^d	≤14	≤43	43 <u>95</u> < 200
In-Bay Background (marine wildlife)^d	<14	<43	N/A

a. These allocations are applicable year-round. Wasteload allocations apply to any sources (existing or future) subject to regulation by a NPDES permit.

b.a. Based on a minimum of no less than five consecutive samples equally spaced over a 30-day period.

c.b. No more than 10% of total samples during any 30-day period may exceed this number.

d.e. Although wildlife is Open space lands and the Bay contain wildlife and are therefore recognized as a potential source areas, it is These areas are not believed to be a significant source of pathogens and their contribution is considered natural background; therefore, no management measures are anticipated for this source required.

d. These allocations are applicable year-round.

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Comment 25.2: "The identification of the small wastewater treatment plants as a Source needs to be expanded....Insert the following sentences into the staff report: 'Water Board prohibits direct discharge from treatment facilities into Tomales Bay or the creeks within the Watershed. Four of the facilities have holding ponds and are permitted to discharge treated effluent to irrigation fields during the dry season. The other five wastewater treatment facilities utilize leach fields for dispersing treated effluent.' And, 'Accidental malfunctions, including the breaching of ponds, a break in a sewage line, or land application at times when the soil is saturated, could result in a discharge of untreated or partially treated effluent to the streams.'

Staff agrees. The above referenced language has been added to Section 8.5 of the Staff Report and the Basin Plan Amendment.

Comment 25.3: To provide consistency "with our authority to protect the existing and designated beneficial uses of water, rather than protecting the individual users of the water, a clarification is needed in the second sentence [under the numeric targets section of the Basin Plan Amendment]. Suggest: "The coliform bacteria targets are based on fecal coliform bacterial concentrations aimed at protecting ~~shellfish consumers and recreational uses~~ the beneficial uses "Shellfish Harvesting" and "Non-contact Water Recreation.""

Staff agrees to modify the language to clearly reference the applicable beneficial uses. However, since those uses include both non-contact and contact recreation, we propose revising the text as follows:

The coliform bacteria targets are based on fecal coliform bacteria concentrations aimed at protecting shellfish harvesting and contact and non-contact water recreation beneficial uses~~shellfish consumers and recreational users~~. These density-based numeric targets define bacterial densities that indicate associated with minimal risk to humans and are the same as based on the water quality objectives contained in Table 3-1. The Tomales Bay targets are intended to protect the most sensitive beneficial use, shellfish harvesting. The tributary targets are intended ~~While water quality objectives~~ to protect recreational uses.

Comment 25.4: Ms. Cox notes that discharge prohibition number five in the San Francisco Bay Basin Plan was adopted before runoff from nonpoint sources was considered a discharge. As written, the Basin Plan does not allow any discharge from either point or nonpoint sources. "Therefore, in order to allow waste load allocations the TMDL implementation plan needs to include an exception to the prohibitions of discharge, such an exception would require an antidegradation finding."

We disagree. Discharge Prohibition no. 5 in Table 4-1 of the Basin Plan prohibits discharge of any wastewater which has particular characteristics of concern to beneficial uses to Tomales Bay...." The accompanying discussion states that Tomales Bay, Drakes Estero, Limantour Estero,

Appendix D. Staff Responses to Comments

Bolinas Lagoon, and Richardson Bay "have experienced high coliform, nutrient, and algal concentrations. This prohibition will provide protection for the intensive recreational beneficial uses of these water bodies."

The discussion does not imply that coliform, nutrients, and algae should be eliminated from these waters or that the Water Board intends to prohibit all discharges that contain these substances. Our 1975 Basin Plan, which is the earliest reference we have been able to locate pertaining to this prohibition, states in the agricultural runoff section (page 16-111) "Lands that have received animal wastes shall be managed to minimize erosion and runoff". There is no mention of the application of the discharge prohibition to agricultural lands. Another key to understanding this prohibition lies in the interpretation of the phrase "particular characteristics of concern to beneficial uses." Chapter 4 of the Basin Plan, in the section titled Discharge Prohibitions Applicable Throughout The Region (page 4-5), states,

"Prohibitions 1 through 5 refer to particular characteristics of concern to beneficial uses....This broad language has been and will be interpreted by the Regional Board on a case-by-case basis. It should be noted that the Regional Board will consider all discharges of treated sewage and other discharges where the treatment process is subject to upset to contain particular characteristics of concern unless the discharger can demonstrate that the discharge of inadequately treated waste will be reliably prevented."

We assert that nonpoint source runoff containing coliform bacteria of animal and wildlife origin, at levels that do not result in exceedances of water quality objectives, is not "wastewater with particular characteristics of concern to beneficial uses." We propose the following text addition to the Basin Plan Amendment to clarify this. We also propose adding a finding to the Board Resolution adopting the Basin Plan Amendment.

Discharging entities will not be held responsible for uncontrollable coliform discharges originating from wildlife. If wildlife contributions are determined to be the cause of exceedances, the TMDL targets and allocation scheme will be revisited as part of the adaptive implementation program. The discharge of human waste is prohibited. All sources of human waste have an allocation of zero. Nonpoint source runoff containing coliform bacteria of animal and wildlife origin, at levels that do not result in exceedances of water objectives, does not constitute wastewater with particular characteristics of concern to beneficial uses. Therefore, animal- and wildlife-associated discharges, in compliance with the conditions of this TMDL, do not constitute a violation of applicable discharge prohibitions.

Comment 25.5: "Should the load allocations for "Direct Discharges to the Bay" be 14 and 43, even though the water quality objectives are 'less than 14' and 'less than 43'?"

We appreciate the comment. We propose adding "<" to all values in Table 22a to be consistent with the water quality objectives.

Appendix D. Staff Responses to Comments

Comment 25.6: "As written, the third paragraph [in the Evaluation and Monitoring section of the Basin Plan Amendment] implies the Regional Board would not consider enforcement until five years had passed. We recommend that the TMDL not limit the Regional Board, they should pursue egregious violations of the Water Code, Basin Plan or permits whenever they occur; or clearly explain why such a delay would be warranted."

Staff agrees with this comment. The Basin Plan Amendment has been modified to read as follows:

~~Approximately every five years, the Water Board will determine if reasonable implementation progress has been made and if additional regulatory or enforcement actions are necessary. If a discharger demonstrates that all technically and economically feasible and cost effective source control measures implementation measures have been undertaken and or that it is infeasible to meet their allocation due to wildlife contributions, the Water Board will consider revising allocations as appropriate.~~ If source control actions are fully implemented throughout the Watershed and the TMDL targets are not met, the Water Board may consider re-evaluating or revising the TMDL and allocations. If, on the other hand, the required actions are not fully implemented, or are partially implemented, the Water Board may consider regulatory or enforcement action against parties or individual dischargers not in compliance.

Comment 28.7: "The added paragraph [in the Adaptive Implementation section of the Basin Plan Amendment] is contrary to California Water Code Section 13263 which states that discharges of waste into waters of the State are privileges, not rights and to the Clean Water Act which prohibits the removal of existing beneficial uses."

We agree that the last sentence could be interpreted as being inconsistent with the Water Code and we therefore propose deleting it. We disagree with the your assertion that the Water Board's reevaluation of water quality standards, as appropriate, is contrary to the intention of the Clean Water Act and the Water Code. Please note that the text does not imply any commitment from the Water Board to either revise a standard or remove a beneficial use. The statement, as written, is consistent with our overall commitment to adaptively manage TMDLs and update and revise them as new science is developed.

If it is demonstrated that all reasonable and feasible source control measures have been implemented for a sufficient period of time and TMDL targets are still not being met, the Water Board will reevaluate water quality standards, TMDL targets and allocations as appropriate. Discharging entities will not be required to do more than what is considered reasonable and feasible.

**Part IV: Staff responses to issues raised at
public hearings (April 20 and June
15, 2005)**

IV STAFF RESPONSES TO ISSUES RAISED AT PUBLIC HEARINGS

Many of the comments raised by the Board Members and members of the public at the public hearings were addressed during the hearings by Water Board staff. In addition, many of the comments raised at the hearings either by the Board Members or from the public are addressed in our the Responses to Common Concerns section presented in the beginning of this document or in specific responses to individual written comment letters. Below we summarize and respond to issues raised in oral testimony at the April 20 and June 15, 2005 hearings that are not addressed elsewhere.

April 20, 2005 Water Board Hearing

Board Member Wolff raised a question asking whether there will be an economic assessment of the benefits of reducing the other identified pollutants (mercury, sediment, and nutrients) as opposed to just for pathogens?

At this point, TMDLs and the associated implementation plans for mercury, sediment, and nutrients have not yet been developed. Staff is working cooperatively within the Water Board and with other stakeholders to develop those TMDLs in a manner that will allow us to leverage implementation actions identified in the pathogens TMDL. We agree that evaluating the cumulative economic benefits of addressing all pollutants in the watershed would be useful.

Board member Wolff asked what would the standard be if it were based on this background level we are seeing in areas coming primarily from wildlife?

We revised Section 3.8 of the Staff Report to include recent (2004 & 2005) monitoring data. The Third Valley Inverness sampling location represents a watershed with minimal human activity and contains wildlife. It was selected specifically to provide data on background bacteria concentrations and loads. We typically sample five times in a thirty-day period because this is the averaging period specified for the water quality objective. Thirty-day fecal coliform bacteria densities for this watershed ranged from 28 – 48 MPN fecal coliform/100mL. Our revised proposed tributary target is 200 MPN fecal coliform/100mL.

June 15, 2005 Water Board Hearing

Board Member Bruce raised a question asking how the standard of 200 MPN relates to shellfish exposure to pathogens.

200 MPN/100mL is the water quality objective for recreational water contact use and is not protective of human consumption of shellfish. The water quality standard of 14

Appendix D. Staff Responses to Comments

MPN/100mL for Tomales Bay is the standard necessary to protect against pathogen-related illnesses from shellfish consumption.

Board Member Muller asked whether discussions of pollutant trading within the Tomales Bay watershed are addressed in TMDL policies.

While the current Pathogens TMDL does not include a policy for trading allowable pollutant loadings between sources, it may be possible to get greater reductions from one source category to offset fewer reductions from another. This would have to be done in a manner to assure that all waters meet targets. The allocation scheme for the tributaries includes source specific allocations and a joint allocation for the lower portion of the tributaries. We encourage landowners within each watershed to work together to determine the best way of attaining the joint tributary target. Trading may be one option, and as long as the upstream targets are met, this would be acceptable under the TMDL.

Sally Posey of the Marin County Farm Bureau expressed concern that much of the funding through EPA is for habitat enhancement, and may have the effect of increasing wildlife in the creeks and their pathogen contribution.

We agree that habitat enhancement can increase wildlife populations in some areas and certainly do not want to discourage habitat enhancement. Issues regarding pathogen contribution from wildlife are addressed in the common concerns response to comments related to background and wildlife contributions. We welcome studies aimed at assessing the benefit of habitat enhancement and its effect on coliform loads and commit to reviewing such studies as we adaptively implement this TMDL.

Appendix D. Staff Responses to Comments

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