



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Total Maximum Daily Load Report For
Pathogens In:

Five-Mile Slough, Lower Calaveras River, Mormon
Slough, Mosher Slough, Smith Canal and Walker
Slough

DRAFT FINAL STAFF REPORT
APPENDIX C
RESPONSE TO COMMENTS ON
PUBLIC REVIEW DRAFT STAFF REPORT AND
RESOLUTION

February 2008

Overview of Public Review

In June 2007, the City of Stockton and US EPA were provided an administrative draft of the staff report and resolution. Comments were received from the City of Stockton on 5 July 2007. Staff provided a response to comments on 17 August 2007, and further changes were made in response to these comments prior to release of the Public Review Draft Staff Report and Resolution.

On 8 January 2008, staff released a Notice of Public Hearing and Public Review Draft Staff Report and Resolution for review and comment. The deadline for public comment was 11 February 2008. One comment letter was received, from the City of Stockton, on the day following the close of comments (12 February 2008). The following provides a summary of comments received and response to comments. A full copy of the comment letter is provided within the agenda package.

Response to Comments on Public Review Draft Staff Report and Resolution

12 February 2008. Letter from Mark J. Madison, Director of Municipal Utilities. City of Stockton. *Public Review of Pathogen TMDL for Stockton Urban Waterways*.

Comment #1:

We suggest that the term "pathogen indicator bacteria" or "indicator bacteria" be substituted for "pathogen" in the Staff Report and TMDL. Throughout the resolution and report, "pathogen" is often used interchangeably with "indicator bacteria." A more careful distinction should be made between the two, as the TMDL is intended for indicator bacteria, and actual pathogens have not traditionally been measured during water sampling. Fecal indicator bacteria are not pathogens, but rather serve as surrogates for assessing health risks for human contact with water. The key studies which determined that fecal indicator bacteria were correlated with human health risks were performed during the early 1980s by the EPA, and more recent studies have shown a weak link between indicator bacteria and health risks in some waterbodies. Since pathogens and indicator bacteria have not previously been studied together in Stockton waterbodies, it is not appropriate to use the wording "pathogen" in the TMDL when indicator bacteria are actually measured.

Response to Comment #1: The purpose of this TMDL is to address impairment caused by pathogens. Staff acknowledges that *E.Coli* and fecal coliform represent pathogen indicators. Even though they are indicators, their purpose is to provide an assessment of pathogen levels. This is a cost savings for

dischargers, compared to having to analyze for all possible pathogens that may be present. The purpose of the TMDL is to address pathogens which potentially impact human health, not just targeted at addressing pathogen indicators.

Section 2.2.1 and Section 4 of the Public Review Draft Staff Report discuss the use of indicator organisms to infer the presence of human pathogenic organisms. In acknowledgement of the comment above, the following areas of the staff report and resolution have been updated to reflect additional clarifying language that the TMDL targets are pathogen indicators and that pathogens are assessed using pathogen indicators:

- Draft Final Resolution Whereas statement 1
- Draft Final Resolution Attachment 1
- Draft Final Staff Report: Executive Summary (pg iii and iv)
- Draft Final Staff Report Problem Statement (pg 5)

Comment #2:

The wording in the Staff Report and TMDL should reflect the limitations of the microbial source tracking component of the Pathogen Plan to identify pathogen sources. The "Implementation" section of the Staff Report (p. iv) states that "By the end of the Pathogen Plan, all pathogen sources should be identified and BMPs should be in place to solve the impairment." The microbial source tracking method utilized (PCR-based detection of host-specific Bacteroidales DNA sequences) allows detection of total, human, dog, and cow/horse —specific bacteria, which should give an indication of the relative contribution from those specific animal hosts to the fecal bacteria load. However, this source tracking technology is relatively new and is rapidly evolving. Currently, only host sources with existing detection assays can be identified, and it is unlikely that "all pathogen sources" can be determined.

Response to Comment #2: Comment noted. The following section of the staff report has been revised to reflect the limitations of the methods used by the Pathogen Plan to identify sources:

- Draft Final Staff Report: Executive Summary (pg iv)

Comment #3:

The implementation plan should specify an iterative framework for evaluating the TMDL throughout the Pathogen Plan... It is not clear whether the Central Valley Water Board intends to evaluate the TMDL based on results of the Pathogen Plan after the completion of each phase, or at the end of the entire plan.

We suggest that the Staff Report and TMDL clarify the approach for evaluating the TMDL. Specifically, we would like to see a more detailed timeline for evaluation incorporated into the TMDL, along with a detailed strategy for implementing alternative control measures should the Pathogen Plan not resolve water quality impairments. We recognize that this TMDL encompasses a more limited scope than that of a recent bacteria TMDL implemented in the Napa River; however, the Stockton pathogen TMDL could still implement a similar review process to evaluate its progress. The following issues should be addressed:

- Provide a timeline for evaluation. For example, the TMDL could be evaluated every 5 years, or at the end of each phase of the Pathogen Plan.*
- Provide specific questions that will be addressed during evaluation of the TMDL, such as those developed in the adaptive implementation strategy for the Napa River bacteria TMDL.*
- Investigate whether it might be appropriate for the TMDL to include an allowable number of exceedances based on background levels of bacteria present in unimpacted waterbodies. The Santa Monica Bay Beaches bacteria TMDL incorporated this approach.*
- Provide a framework for reevaluating and adapting the TMDL based on findings from periodic review.*

Response to Comment #3: Additional language has been added to the staff report to clarify the intent of staff regarding evaluation of the TMDL. For TMDL purposes, staff anticipates an assessment following completion of the Pathogen Plan. This is discussed in the Public Review Draft Resolution Whereas No.5, which states: *NPDES permit Order No. R5-2007-0173; NPDES No. CAS083470 requires the Pathogen Plan to be completed by the end date specified in the plan, at which point water quality objectives for bacteria should be met. Should the water body still fail to meet water quality objectives, the TMDL will be reevaluated to determine what additional measures need to be taken.*

Additionally, the Stockton MS4 Permit provides that a reassessment may occur during permit renewal. On page 59 of the MS4 permit (D.28.c.iii), it states *“Regional Water Board staff will reevaluate the impairment problem in the Stockton urban waterways upon the expiration date of this Order and/or at the conclusion of the Pathogens Plan. If necessary, additional controls and regulatory options will be identified by the Regional Water Board with assistance by the Permittees to address the impairment.”*

When review occurs, staff will need to determine if the impairment has been adequately addressed, or if additional efforts are necessary. Staff has amended the staff report to include a list of potential review topics:

- Draft Final Staff Report: Implementation Plan (pg 28-29).

In regards to the request to allow a certain number of exceedances based on background levels of bacteria present in unimpacted waterbodies (Santa Monica Bay Beaches Bacteria TMDL¹), this approach is not suitable for the currently proposed TMDL. Though this TMDL acknowledges that future efforts may be needed, it currently is focused on addressing pathogens using the City of Stockton's existing Pathogen Plan, as required by their MS4 permit. An approach integrating allowable exceedances can only be used if a Basin Plan Amendment is prepared, which is not appropriate based on the amount of information available at this time.

The Santa Monica Bay Beaches TMDL relies on a reference system approach to justify allowing a certain number of exceedances due to contributions from natural sources (such as wildlife). Instead of relying on the traditional approach of water quality objectives set at levels protective of a given beneficial use, the reference system/antidegradation approach only ensures that bacteriological water quality is at least as good as a reference condition. Use of this approach takes considerable knowledge about the presence of natural sources within a given watershed, which are not currently available for Stockton urban water bodies. This approach is only feasible when a reference site can be selected that receives loading from an identified natural source, but not from any significant anthropogenic sources.

Comment #4:

The modified Pathogen Work Plan schedule is not addressed in the report.

Response to Comment #4: The April 2004 Pathogen Plan (finalized August 2004) includes three phases addressing six waterways, which spans a three-year implementation schedule for each phase. The currently scheduled end date² is 30 June 2013, however the City of Stockton has requested an extension.

The following section of the staff report has been updated to reflect that 1) the City of Stockton has requested an extension of their Pathogen Plan timeline and 2) the Central Valley Water Board has not yet acted on this request, thus the original timeline remains in effect (until the Pathogen Plan is modified):

- Draft Final Staff Report: Source and Linkage Analysis (pg 23)

¹ "The Santa Monica Bay Beaches Bacteria TMDL (Basin Plan Amendment) limits the number of allowable days that the single sample bacteria standards may be exceeded, but requires compliance with the 30-day geometric mean at all times. TMDL information available at: <http://www.waterboards.ca.gov/losangeles/html/bpaRes/bpa.html>

² City of Stockton/San Joaquin County Larry Walker Associates. 1 April 2004 (Finalized August 2004). *City of Stockton San Joaquin County Pathogen Plan*. Table 4. Schedule for Water body Monitoring and Analysis. Pg 39.

Comment #5:

Identification of pathogen sources is still underway for Smith Canal and Mormon Slough.

Response to Comment #5: Comment noted. The following sections of the staff report have been updated accordingly:

- Draft Final Staff Report: Executive Summary (pg iv)
- Draft Final Staff Report: Source and Linkage Analysis (pg 23)

Comment #6:

There is a potential for re-growth of indicator bacteria in the environment. The "Margin of Safety" section (p. 27) states that pathogens cannot survive for long periods of time outside of the host body, and are thus expected to decrease in concentrations as they move away from the source. However, the indicator bacteria which are the basis for the TMDL do not necessarily exhibit the same survival characteristics as the pathogens they are supposed to represent. Recent studies have shown that E. coli/ and other bacteria with fecal origin can survive, grow, and establish populations in natural environments such as streams, and that their survival does not necessarily correlate with that of pathogens. Because of this potential for re-growth, it would be appropriate to consider a TMDL similar to the Santa Monica Bay beaches bacteria TMDL, which takes into account background levels of indicator bacteria, and accordingly allows for a certain number of exceedances.

Response to Comment #6: TMDLs are required to include either an implicit or explicit Margin of Safety (MOS) to provide an “accounting of uncertainty about the relationship between pollutant loads and receiving water quality. The margin of safety can be provided implicitly through analytical assumptions or explicitly by reserving a portion of loading capacity³.” This TMDL includes an implicit MOS based on using conservative assumptions. The MOS is meant to provide greater assurance of protection of water quality, not additional exceedance allowances for dischargers. Using a conservative approach entails assuming worst case scenarios rather than possible outcomes. Though the commenters bring to attention research showing that it is possible for certain fecal indicators to re-grow in the environment, staff is unaware of any documented evidence showing that this will always occur in the urban waterbodies covered by this TMDL.

In regards to the allowable exceedance approach of the Santa Monica Bay Beaches Bacteria TMDL, see response to Comment 3.

³ US EPA. January 2001. *Protocol for Developing Pathogen TMDLs*.