3.11 TOTAL MAXIMUM DAILY LOAD (TMDL) PROGRAM

The Clean Water Act requires states to identify impaired waterbodies and the pollutants causing the impairment and to establish the Total Maximum Daily Load (TMDL) of the pollutant to the waterbody necessary to eliminate the impairment. The state must also identify pollutant sources and allocate the allowable pollutant load to the sources. An implementation plan must also be established. The complete TMDL including allocations and implementation plan must be incorporated into the Basin Plan.

A complete TMDL includes the following specific elements:

- *Problem Statement:*
  Description of which standards are not being attained, which beneficial uses are impaired and the nature of the impairment.
- *Numeric Targets: The Desired Future Condition:*
  Measurements that will describe protection of the beneficial uses that are impaired, and attainment of standards. They should provide a basis to assess progress towards, or attainment of standards. Numeric targets may be existing, new, or site-specific numeric water quality objectives. Alternatively they may be a quantitative measure that is a surrogate for a narrative water quality objective or a surrogate for a numeric water quality objective that provides a better basis to link sources to the impairment.
- *Source Analysis:*
  Amount, timing, and point of origin of pollutants of concern.
- *Linkage Analysis:*
  Description of the relationship between numeric target(s) and sources and estimation of the assimilative (loading) capacity of the water body for the pollutant. The loading capacity is the quantitative link between the applicable water quality standard (as interpreted through numeric targets) and the TMDL.
- *TMDL and Allocations:*
  The TMDL may be all or part of the loading capacity. The TMDL is then allocated amongst point, nonpoint, and background sources. Allocations may be specific to agencies or persons (businesses) or generally by source category or sector.
- *Margin of Safety:*
  A margin of safety must be incorporated into the TMDL. The margin of safety may be implicit (using conservative assumptions) or explicit (a discrete allocation assigned to the margin of safety).
- *Implementation Plan:*
  Actions, responsible parties, and schedules necessary to alleviate the impairment and meet the allowable TMDL and allocations. Identifies enforceable features (e.g. prohibition), and triggers for Regional Board action (e.g. performance standards). May be part of a watershed management plan.
- *Monitoring / Revaluation:*
  Monitoring strategy to track implementation of actions and elimination of impairment, and, if necessary, consideration of TMDL revisions.

Our strategy is to approach each TMDL from the perspective that solution of the water quality problem is the goal not the TMDL itself. As such, we will evaluate the need and benefit of tasks in each of the complete TMDL elements and focus resources on tasks

most critical to the ultimate solution. For example, problem definition would be a high priority for waterbodies that may be listed as impaired based on limited, outdated or poor quality data. Source analysis may be the critical gap for other TMDLs. Consideration of implementation alternatives, enforcement mechanisms, and watershed management will be critical for TMDLs that have nonpoint sources as the primary source of the water quality impairment.

TMDL projects and schedules for the San Francisco Bay Region are available on the Regional Board website at www.swrcb.ca.gov/rwqcb2/tmdlmain.htm. The website also describes the TMDL process and TMDL reports completed to date.

The WMI provides an operative framework to meet the challenges associated with the development and implementation of TMDLs for pollutants causing impairment of waters. A complete TMDL encompasses many tasks and activities directly or indirectly associated with watershed/waterbody characterization, assessment, and management and other programs (e.g., NPDES, Nonpoint Source Program, Monitoring and Assessment, and Basin Planning). Consequently, TMDL development and implementation must be closely coordinated with watershed and program tasks on both the regionwide and county watershed management area levels. Accordingly, TMDL related issues and tasks are appropriately noted in other sections of this Chapter.

Stakeholder participation and support will be essential for all TMDL projects. We continually identify and create opportunities to enhance involvement and collaboration with stakeholders. These efforts include improved outreach and communication associated and improved descriptions and use of stakeholder involvement and collaboration opportunities and mechanisms. Integral to this effort will be the recognition that stakeholders may bring information and expertise to the table. For each TMDL project, we will strive for the most focused and efficient process that allows all stakeholders to effectively participate and ensures balanced representation on any recognized “watershed” or stakeholder forum. Mechanisms will range from compilation and maintenance of interested parties lists to formally recognized and facilitated stakeholder forums. Other state and federal agencies are key stakeholders in the development and implementation of TMDLs. Our TMDL efforts overlap authorities and programs of other agencies. Certain TMDLs are dependent on efforts by these other agencies (e.g., pesticide TMDLs and the USEPA and DPR). In some cases, actions by other agencies may even conflict with or create barriers to TMDL efforts. We will seek opportunities to enhance coordination and collaboration with other agencies, and overlaps, conflicts, and barriers will be identified and appropriate resolutions, agreements, etc. will be pursued.

There are a number of significant challenges that do not have easy resolution that we must overcome to succeed. San Francisco Bay is an estuary with complex hydrodynamics and sediment and biochemical fate and transport processes, and there are significant limitations to existing quantitative fate and transport models. A number of water quality problems are due to chemicals that are no longer in use and have no known active discharges (e.g., DDT). Others are due to sources beyond the jurisdiction of the

Regional Board (e.g., mercury, pesticides). A number of waterbodies are impaired due to excessive siltation, but it is very difficult to distinguish between natural and human caused sources of sediment, and to distinguish between excessive siltation and impairment due to flow alterations. These challenges and the potential high costs associated with their resolution provide further cause to work within the Watershed Management Initiative to set priorities and identify cost-effective tasks to establish and attain TMDLs through integration with other efforts and collaboration with stakeholders.

As previously noted, the WMI provides the operative framework for allocation of these resources and identification of priorities and additional resource needs. We have regionwide project and program management resource needs in addition to specific TMDL project resource needs. These include management of the TMDL program (roundtable participation, preparation of workplans and reports, program development and budget planning, outreach and education, participation in workshops and other forums) and development of a regionwide sediment TMDL strategy.

Numerous water bodies in the San Francisco Bay Region are listed as impaired due to excessive siltation or sedimentation. Consequently, sediment TMDLs including implementation plans are required to remedy the impairments. A regional approach to this challenge (versus one watershed at a time) provides economies of scale in terms of both resources and time. The regional approach is founded on the premise that subwatershed areas with common attributes that influence sediment input (geology, vegetation, land use, and topography) can be defined and characterized. Characterization and assessment of representative subwatershed areas will provide reference states, a quantitative understanding of sediment production and its relationship to habitat quality, and a basis for distinguishing sediment associated with natural processes from sediment from land-use activities. A key first step is in this strategy is the compilation of data relevant to the findings of impairment in the listed water bodies.

We are fortunate to have dedicated resources for TMDL development and a TMDL Unit that promotes a team approach and provides a focal point for TMDL activities in the Region. In addition to the TMDL Unit, we coordinate and integrate actions and activities of our Planning Unit, which is combined with TMDL into one Division, and with the Watershed Management and NPDES Divisions. Improved coordination and integration among these areas and other functions of the Regional Board are a high priority.

Further information about our TMDL program and status of individual TMDLs in the Region can be found on our website at:
http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/