General Comments on Draft 303(d) Listings

http://www.swrcb.ca.gov/rwqcb9/Programs/TMDL/303d/303d.html

1. Inadequate Data Sets

Many of the draft listings are based on small data sets that are limited in temporal and/ or spatial extent, or that have long periods where no sampling was conducted. Several of the proposed 303(d) listings would be more appropriately placed on the list that summarizes pollutants/ waterbodies of potential concern (Table 6 of the Staff Report) and re-evaluated during the next 303(d) update. These waterbodies will continue to be sampled and assessed in the coming years, resulting in a much more definitive data set when the next listing cycle occurs.

In several instances the linear extent of impairment is determined by as few as one sample or reading (e.g. TDS in the San Luis Rey River). It is critical that the extent of impairments be defined with data sets of sufficient temporal and spatial scope.

It is recommended that the San Diego RWQCB should re-evaluate the proposed TDS, mineral, nutrient, and color listings and move those that are based on limited data sets to the list of pollutants/ waterbodies of potential concern and solicit stakeholders' assistance in acquiring the appropriate information needed to better evaluate these pollutants/ waterbodies for the future.

2. Data Validity/Quality

In Table 2 and Appendix B of the Draft 303(d) Update, the San Diego RWQCB lists the data that was used to assess each water body however; a specific evaluation of the data's validity was not presented in this report. The data sets are not adequately described in terms of sample collection methods, spatial and temporal distribution of sampling, and data quality. Without this information it is generally difficult to determine whether each listing is appropriate.

Utilizing the approach for assessing and documenting data quality recommended in the USEPA guidelines for preparation of the 305(b) water quality assessment reports and the latest draft guidance from the Consolidated Assessment and Listing Methodology (CALM) (USEPA, 1996; USEPA, 2001) would improve the 303(d) listing process, and create consistency with other regional boards in California.

An excellent example of these guidelines being effectively incorporated into the 303(d) listing process is the Staff Report prepared for the 2002 Revisions to the Section 303(d) List For San Francisco Bay Region. The San Francisco RWQCB used the recommended federal guidelines referenced above to establish a data hierarchy that addressed the following data quality considerations: 1) sample collection and analytical technique (grab, composite, series of grabs, or continuous), 2) spatial representativeness (locations in the watershed or waterbody), 3) temporal representativeness (frequency of sampling, number of seasons or years) and, 4) quality assurance procedures (documentation of protocols, metadata, confirmation analyses, training).

Based on these considerations of the rigor of sampling and analysis by the San Francisco RWQBC, the data were rated according to "Level of Information", where 1=Lowest, and 4=Highest. All data reviewed for consideration for the 2002 303(d) list were ranked according to these standards. Only data of higher overall level of information (3 to 4) were used. If data of lower level of information (1 to 2) suggested impairment, the waterbody/ pollutant combination was recommended for the "preliminary" list. The San Francisco RWQCB Staff Report documented this data evaluation in a table (Table A-2 of Proposed Revisions to Section 303(d) List and Priorities For Development of Total Maximum Daily Loads For San Francisco Bay Region, November 2001).

3. <u>Statistical Methodology</u>

The statistical methods used to analyze the water quality data sets appear to be incomplete and in many cases inappropriate. Arithmetic averaging and comparison of these averages to water quality objectives were used, but other important statistical tools were omitted. A more rigorous and authoritative statistical analysis of the water quality data sets would be achieved if techniques such as the assessment of distribution normality, log transformation (where appropriate), outlier tests, and the calculation of statistical confidence intervals and variance were employed.

The Staff Report cites the existence of increasing trends in constituent concentration on numerous occasions (TDS in Sandia Creek, TDS in Santa Margarita near Temecula, sulfate in Spring Valley Creek, etc.). Linear regressions on the data sets were performed and the existence of trends was ascertained by "eyeballing" the regression lines (San Diego RWQCB, pers. comm., November 13, 2001). Acceptable statistical techniques for assessing the significance of trend lines include T-testing the slope of the regression line when the data is normally distributed and the Mann-Kendall test for non-normally distributed data.

It is apparent that in many cases the water quality data sets were not stratified into dry weather/ low-flow and wet weather/ high-flow categories prior to analysis. If the data sets were not stratified prior to submittal to the San Diego RWQCB they were analyzed as received (San Diego RWQCB, pers. comm., November 13, 2001). Dry weather and wet weather samples may exhibit substantially different physical and chemical characteristics. During storm events, flowing waterbodies may carry excessive sediment loads. Many pollutants including phosphorus, trace metals, bacteria, and some organic toxins will adhere to the finer-grained particles (clays and silts) in the sediment load. Conversely, the concentration of some dissolved constituents like nitrate may be diluted during a high flow storm event except during the initial first flush.

Where appropriate, the data should be carefully stratified into low and high flow subsets and analyzed separately. The weight of evidence approach can be applied to the overall results.

4. Background Conditions

In the 303(d) Staff Report, the San Diego RWQCB repeatedly asserts that exceedances of the TDS objectives 'are mostly traceable to human impacts, and therefore, can be mitigated'. Given the current knowledge of each of the waterbodies listed for TDS and the limited extent of the data sets, this statement is somewhat speculative. A rigorous statistical and historical analysis of the available data, and an assessment of regional groundwater conditions should be conducted to identify anthropogenic and natural pollutant sources.

It should be noted that a major source of drinking water in much of San Diego County is the Colorado River. This source is high in many dissolved constituents (TDS levels are usually > 450 mg/ L) and may be largely responsible for many of the proposed 303(d) listings related to elevated mineral concentrations (e.g. chloride, sulfate, TDS). The San Diego RWQCB repeatedly attributes elevated TDS and mineral concentrations to human impacts in the Staff Report, but does not specifically mention the regional use of imported water as a source of this salinity.

It is recommended that the Basin Plan water quality objectives need to be re-evaluated to more closely reflect the relationship between surface waters and the protection of local water supplies. If surface waters are not actually recharging a water supply aquifer or a drinking water reservoir, then they should not be held to the stringent drinking water standards needed to protect a municipal water supply beneficial use (or Potential Municipal Designation).

5. Seasonality and Hydrologic Considerations

The effects of seasonality and natural hydrologic fluctuations on the concentration of minerals such as sulfate, chloride, and TDS in surface waterbodies has not been considered in the data analysis. Surface water flows are comprised of a combination of surface runoff and groundwater baseflow during the winter and spring months. During the winter groundwater basins are recharged by more dilute stormwater. During the summer there is far less surface runoff and a higher percentage of the flow in surface waterbodies consists of more saline groundwater. These natural hydrologic fluctuations should be considered when analyzing water quality data for mineral constituents. In many instances when assessing minerals and TDS for inclusion on the 303(d) list, the San Diego RWQCB did not consider natural hydrologic cycles (e.g. TDS in the Santa Margarita River and the San Diego River).

Long-term rainfall/weather and groundwater recharge patterns (e.g. El Nino, La Nina, etc.) also effect mineral concentrations in surface waters. During wet years/periods groundwater recharge and surface water dilution is enhanced resulting in improved water quality. During drought periods water quality is often degraded by the natural concentration of pollutants. These factors should be considered when assessing trends in TDS and other dissolved constituents.

6. Listing Redundancies

Numerous listings outlined in the San Diego RWQCB Draft 303(d) document are redundant when viewed in the context of a watershed approach to TMDL development and implementation. The San Francisco RWQCB states the following in its November 2001 303(d) Staff Report (page 4):

"In instances where a mainstream water body in a watershed is listed for a pollutant/ stressor, the tributaries are assumed to be impaired as well and would be analyzed eventually with respect to potential sources of pollutants in a TMDL. As such, it is redundant to list tributary water bodies, if the mainstem water body is already listed. The mainstem listing approach also provides a structure to address non-navigable portions of the water body system in a watershed, and prevents the unnecessary proliferation of TMDL processes that are obviously interrelated."

The Project Clean Water Science and Technology Technical Advisory Committee (TAC) agrees that this approach is logical and will help both regulators and regulated communities avoid a substantial amount of unnecessary TMDL development work. The TAC suggests that the individual tributary listings that are redundant with the mainstem listings be excluded from the 303(d) list; however, they provide valuable information to support the mainstem 303(d) listing and should be included within the discussion. The tributaries in question will serve to focus source identification and remediation efforts for the overall watershed (mainstem) TMDL, which will result in a more efficient allocation of resources for TMDL development and ultimately, water quality improvement.

Based on the San Francisco RWQCB approach outlined above, the following listings should be considered for removal from the San Diego Region 303(d) Listing:

Waterbody	Listing	Redundancy of Listing
1. Sandia Creek	TDS	Upper Santa Margarita River
2. Murrieta Creek	Phosphorus	Upper Santa Margarita River
3. Cloverdale Creek	Phosphorus, TDS	Lake Hodges
4. Felicita Creek	TDS	Lake Hodges
5. Kit Carson Creek	TDS	Lake Hodges
6. Forrester Creek	fecal coliform, TDS	Lower San Diego River

7. Methods for Demarcating Coastal Bacteriological Impairments

The use of one of the criteria used to demarcate the extent of bacteriological impairments along the San Diego County coastline is questionable. The Staff Report cites the presence of permanent public health risk warning signs at storm drains or creek outlets as an indication of "chronically contaminated sites". This criterion is not based upon readily available bacteriological data. The Beach Water Quality Workgroup lead by the Monitoring and Reporting Subcommittee of the State Water Resources Control Board recommends that all dry weather flowing storm drains be posted with permanent signs even without evidence of chronic contamination. Conservative assumptions are necessary in the absence of specific data to protect public health. The use of such assumptions to support a 303(d) listing is less appropriate. It is believed that the San Diego RWQCB

misunderstood the true intent of the permanent signs, which is to be extremely protective of public health.

Because of the criteria used for “evidence of impairment”, the San Diego RWQCB did not conduct an analysis of the available shoreline bacteriological data associated with these sites. A close inspection of this data set reveals that many of the shoreline locations cited in the Staff Report exceeded water quality objectives on very few occasions and may not be appropriate indicators of the extent of these coastal impairments.