

Conceptual Plan for Water Quality Standard Evaluations and TMDL Development in Nevada

Nevada Division of Environmental Protection

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Introduction

In 2002, the Nevada Division of Environmental Protection – Bureau of Water Quality Planning (BWQP) issued its latest 303(d) List. Primarily due to modifications in the listing methodology, the 2002 303(d) List represented a significant expansion from the previous list. Including EPA amendments, the 2002 List contains over 300 waterbody/pollutant combinations. From the beginning, BWQP has viewed this list as a planning tool to guide our other activities such as monitoring, water quality standards evaluations, assessments, TMDLs, etc. Figure 1 provides a breakdown of the various waterbody/pollutant combinations identified in the 2002 303(d) List and significant issues associated with each.

Of particular interest are the technical issues associated with our water quality standards. The water quality standards – consisting of beneficial use definitions and numeric criteria – are the foundation upon which a state builds its TMDLs. Any deficiencies in the standards will translate into inappropriate and ineffective TMDLs. According to the National Research Council (2001):

“Water quality standards are the benchmark for establishing whether a waterbody is impaired; if the standards are flawed (as many are), all subsequent steps in the TMDL process will be affected”.

Recognizing these issues, the National Research Council (2001) goes on to recommend that:

“States should develop appropriate use designations for waterbodies in advance of assessment and refine these use designations prior to TMDL development”

“To ensure that designated uses are appropriate, use attainability analysis should be considered for all waterbodies before a TMDL is developed.”

The need to re-evaluate water quality standards prior to TMDL development is not a new concept. As part of a discussion on a “water quality-based approach to pollution control”, EPA (1994) presents a framework that states can follow to meet the needs of the Clean Water Act with standards evaluations preceding TMDL development. This document provides justification for standards evaluations by stating:

“...many States have not conducted in-depth analyses of appropriate uses and criteria for all water bodies but have designated general fishable/swimmable use classifications and statewide criteria on a ‘best professional judgment’ basis to many waters...It is possible that these generally applied standards, although meeting the minimum requirements of the CWA and WQS regulation, may be inappropriate (either over- or under-protective) for a specific water body that has not had an in-depth standards analysis.”

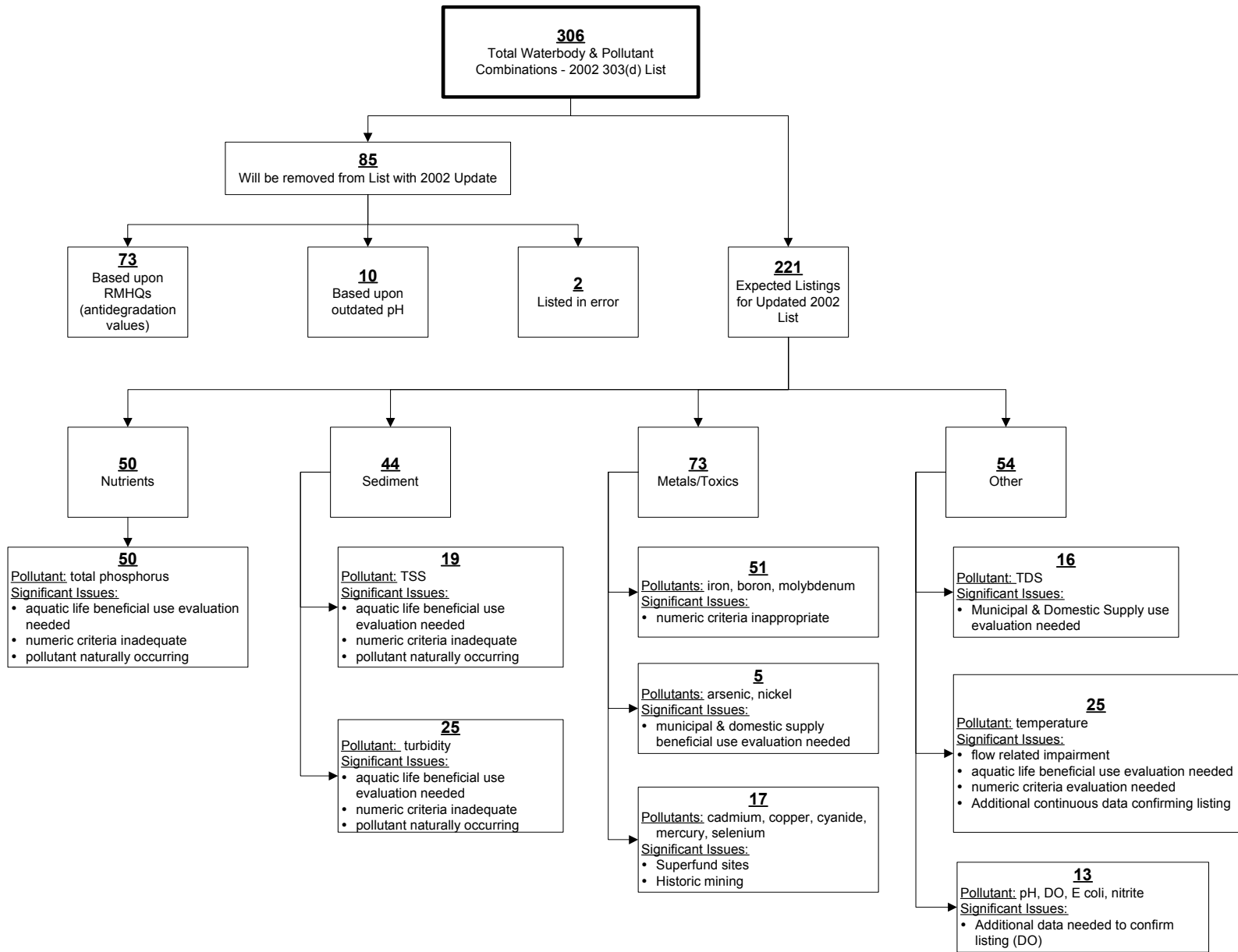


Figure 1. Breakdown of Waterbody/Pollutant Combinations in 2002 303(d) List

As shown on Figure 1, a majority of the 303(d) listings have significant issues relating to beneficial use and numeric criteria appropriateness. Nevada desires to first address these issues in order to establish a sound foundation for TMDLs. Following is a summary of BWQP's conceptual plan for addressing these issues and meeting its TMDL development responsibilities. This framework will provide for scientifically defensible decisions within the various water programs and potentially eliminate costly and unnecessary requirements.

Conceptual Plan Framework

As part of a rotating basin approach to address the above issues, BWQP is proposing to select a watershed and concentrate its resources with a team of staff representing each of the three branches: Nonpoint Source, Standards and Monitoring. For the selected basin, a strategic plan will be developed to guide the activities. As the focused efforts in this basin are concluding, BWQP will select another watershed and begin transitioning its efforts towards that particular waterbody. Use of the term "transition" must be emphasized as it is not expected that BWQP will be abruptly moving its focused efforts from one basin to the next. During the transition phase, significant monitoring may be needed upfront to help design the project needs for the next watershed.

The basic framework upon which BWQP will build its water quality standard and TMDL activities within the selected watershed are as follows (also see Figure 2):

1) Beneficial Use & Criteria Evaluation

The first phase in this approach is to evaluate whether or not the particular beneficial use is appropriate (currently exists or is attainable under certain circumstances) or needs to be revised. Much of this phase could involve use attainability analyses (UAA), with water quality standards revisions pursued as needed. The specifics of Phase 1 will vary greatly depending upon the waterbody, and the beneficial use and pollutant of concern. In some cases, a use impairment determination (Phase 2) will be needed as part of Phase 1. It must be realized that many of the projects needed to support Phase 1 will also support work under Phase 3 (TMDL Development).

2) Use Impairment Determination

As the original 303(d) listings may have been based upon inappropriate or outdated criteria, or limited data, impairment of the beneficial use needs to be confirmed during the next phase. If no impairment of the appropriate use is determined or impairment found to be due solely to pollution but not a pollutant, then the waterbody will be removed from the 303(d) List during the next listing cycle. If impairment found to be due to a pollutant(s), then the next phase (TMDL development) is pursued.

In recent EPA guidance (2003), states are being encouraged to develop an Integrated Report which meets the needs of both the 303(d) List and the 305(b) Report. The integrated report is to consist of 5 parts. Of particular interest are Part 4C and Part 5:

Part 4C: Waters should be listed in this subcategory when an impairment is not caused by a pollutant¹ but by pollution. TMDLs are not required for these waters.

Part 5: Waters should be placed in this category when it is determined that a pollutant is causing the impairment. TMDLs are required for these waters.

3) TMDL Development

If beneficial use impairment from a pollutant is confirmed, the next phase is the development of the TMDL. It is likely that a majority of the information generated during Phases 1 and 2 will be useful in the TMDL development. Another significant task could involve characterization of the impairment sources followed by load allocations.

It is important to recognize that for each of the above phases, significant data compilation, monitoring and research efforts may be needed. However, the activities needed for one phase may very well be useful for the other steps in the process.

While BWQP believes that following these 3 phases are key to creating realistic and defensible water quality criteria and TMDLs, it is recognized that significant resources (time, money, etc.) are needed to meet these needs. As a result, strict adherence to this 3-phase approach will delay our ability to develop TMDLs in the near future and increase NDEP's and EPA's liability under the Clean Water Act. For that reason, NDEP will also pursue selected simplified TMDLs concurrent with its "3 Phase" activities.

¹ Pollution, as defined by the CWA, is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water" (Section 502(19)). In some cases, the pollution is caused by the presence of a pollutant and a TMDL is required. In other cases, pollution does not result from a pollutant and a TMDL is not required.

The following are two examples of pollution caused by pollutants. The discharge of copper from an NPDES regulated facility is the introduction of a pollutant into a water. To the extent that this pollutant alters the chemical or biological integrity of the water, it is also an example of pollution. (Copper is not likely to cause an alteration to the water's physical integrity). Similarly, actions that modify the landscape and may result in the introduction of sediment into a water constitute pollution when sediment (which is a pollutant) results in an alteration of the chemical, physical, biological or radiological integrity of the water. TMDLs would have to be established for each of these waters.

EPA does not believe that flow, or lack of flow, is a pollutant as defined by CWA Section 502(6). Low flow can be a man-induced condition of a water (i.e., a reduced volume of water) which fits the definition of pollution. Lack of flow sometimes leads to the increase of the concentration of a pollutant (e.g., sediment) in a water. In the situation where a pollutant is present a TMDL, which may consider variations in flow, is required for that pollutant.

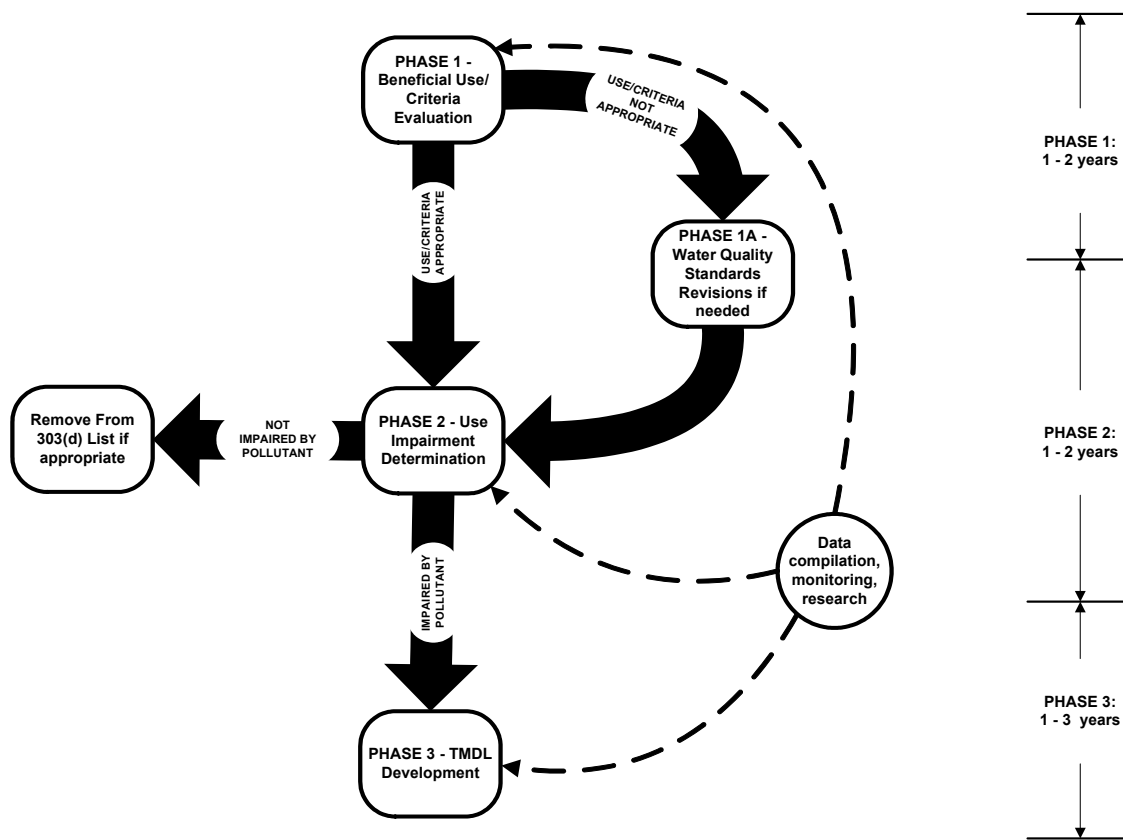


Figure 2. Schematic of Conceptual Plan Framework

Near Term Activities under this Framework

Following are brief descriptions of near-term activities BWQP will pursue under the framework discussed above:

- In early 2000, the Bureau of Water Quality Planning (BWQP) formed an internal watershed group to focus on Carson River basin water quality issues. Since inception of the group, staff from the Bureau’s three branches (Nonpoint Source, Standards, and Monitoring) have been strategizing and implementing activities for dealing with the variety of water quality issues within the basin. Numerous monitoring and research efforts are underway to assist us in evaluating the beneficial uses, criteria and impairment in the watershed (Step 1, Figure 2). It is BWQP’s intention to continue through with these efforts on the Carson River. Currently, BWQP is developing a detailed plan outlining current and future project needs, funding needs, and an expected timeline. Upon completion, this document will be distributed to EPA for review. As the issues within the Carson basin are varied and complex, completion of the Carson basin activities under this framework may take several years. In the interim, BWQP is planning to

develop simplified TMDLs using load duration curves for several of the listed pollutants within the Carson basin.

- The current focus of BWQP's watershed group is currently the Carson River, but the team is hoping to begin moving into the upper Humboldt basin in Fiscal Year 2005. It has been decided that the entire upper Humboldt River is too large of an area for the watershed team to address, and that the group needs to focus on a subwatershed for future focused efforts. Staff will begin developing a preassessment of the waters of the upper Humboldt to serve as a tool in selecting a subwatershed for focused study. Completion of the preassessment is targeted for Fiscal Year 2005.
- By Consent Decree, EPA agreed to establish a Walker Lake total dissolved solids (TDS) TMDL by 3/15/2005. It is anticipated that BWQP will begin working on this TMDL in late spring of 2004 with completion/approval targeted for 3/15/2005.
- In addition to the above activities, BWQP may also contract for professional services associated with assessments and TMDL if funds become available.

References

National Research Council. Assessing the TMDL Approach to Water Quality Management. 2001.

U.S. Environmental Protection Agency. Water Quality Standard Handbook: Second Edition. EPA-823-B-94-005a. August 1994.