# NEVADA'S 1998 303(d) LIST

## Introduction

Section 303(d) of the Clean Water Act requires that States develop a list of water bodies that need additional work beyond existing controls to achieve or maintain water quality standards. The additional work necessary includes the establishment of Total Maximum Daily Loads (TMDLs). The TMDL process provides an analytical framework to identify the relative contributions of each pollutant. The TMDL identifies the sources and causes of pollution or stress, e.g., point sources, non point sources, or a combination of both, and establishes allocations for each source of pollution or stress as needed to attain water quality standards.

The section 303(d) List provides a comprehensive inventory of water bodies impaired by all sources, including point sources, nonpoint sources, or a combination of both. This inventory is the basis for targeting water bodies for watershed-based solutions, and the TMDL process provides an organized framework to develop these solutions.

## METHODOLOGY

## Basis For Listing

The criteria for listing were developed to identify only those waterbody segments for which there is good documentation that water quality standards are not being met. NDEP has taken the approach in this listing, and in past listings, that quantitative information is needed to serve as the basis for listing. At this time, the most comprehensive readily available water quality related data is physical and chemical water column monitoring data, and widely distributed scientifically defensible special studies. The methodology for listing focuses on data analysis; although where scientifically defensible studies are readily available these were also used. Since the majority of the narrative water quality standards are of a subjective nature and there is not quantitative information readily available to assess compliance with the narrative standards, listing is focused on violations of numeric water quality standards. The public notice and comment period provided the opportunity for other local, state, or federal agencies, members of the public or academic institutions to present additional monitoring data, ongoing research or other publications for consideration in the 303(d) listing process.

NDEP's ambient monitoring network covers each major river basin in the state. Samples are analyzed for chemical quality. Nevada does not conduct any type of biological assessments or bioassays at this time. Ambient monitoring data was assessed for exceedances of numeric beneficial use water quality standards. Beneficial use standards are contained in Nevada Administrative Code (NAC) 445A.119 to 445A.225. Other available information, studies and best professional judgment were also used in the listing decisions.

In general, a waterbody was included on the 303(d) List if the beneficial use standards were exceeded more than 25% of the time. The 1998 303(d) List was based on data from January 1996 to December 1997. A minimum of four samples collected during 1996 & 1997 was required. Federal regulations (40CFR 130.7(b)(5)(i)) require states to include waters identified on the most recent 305(b) report as "partially meeting" or "not meeting" designated uses on the 303(d) List. With limited resources to ensure that the most severe water quality problems are addressed first, Nevada choose to include only those waterbodies that are in the "not meeting" designated uses category on the 303(d) List.

Both 1996 and 1997 were wetter than average years. Devastating floods occurred in western Nevada on the Truckee, Carson and Walker Rivers in January 1997. The Carson and Walker Rivers had record high flows at many locations. Flooding is a natural process and data that shows impairment as a result of a major flood event should not serve as the basis for initiating TMDLs. Nevada Administrative Code (NAC) 445A.120.2 states that "Natural conditions may on occassion be outside the limits established by the standards." NAC 445A.121(8) states, "The specified standards are not considered violated when the natural conditions of the receiving water are outside the established limits including periods of extreme high or low flow ...." Therefore, if greater than 25% violations is the result of sampling conducted during flood conditions only, the site was not listed. The flow data for 1997 is not yet available so the only data eliminated from the analysis was data associated with the January 1997 flooding on the Truckee, Carson and Walker Rivers. When flow data is available, NDEP will re-evaluate the listing decisions.

## Delisting

There are sites and parameters that were identified on the 1996 303(d) List that are not included on the 1998 303(d) List. Specific explanations for the delisting are included in the 303(d) Lists at the end of this report. In general, parameters were delisted because the waterbody now meets the water quality standards.

## Prioritization & Schedule

Prioritizing water bodies enables the state to make efficient use of available resources to meet the objectives of the Clean Water Act. Priority ranking takes into account the severity of the pollution and the uses to be made of such waters.

Targeting high priority waters for TMDL development reflects an evaluation of the relative value and benefit of water bodies within the state and takes into consideration the following:

- ➤ Risk to human and aquatic life
- ➤ Degree of public interest and support
- ➤ Recreational, economic, aesthetic importance of a particular waterbody
- ➤ Vulnerability or fragility of a particular waterbody as an aquatic habitat
- ➤ Immediate programmatic needs such as:
    - • waste load allocations
    - • permits to be issued
    - • new or expanding discharges
    - • load allocations for needed BMPs.

Table One provides a summary of the dates the water quality standards were last reviewed by the State Environmental Commission and factors which influenced setting priorities. Table Two provides the priority ranking and schedule for TMDL development.

## TABLE ONE

| River Basin | Date of Standards Review | Important Factors in Prioritization Process |
|---|---|---|
| Carson | Sep 15, 1994 | 1.Confirmed mercury contamination.<br>2. Fish consumption advisory.<br>3. Protection of downstream wetlands.<br>4. Protection of downstream reservoir with high recreational usage.<br>5. Need to investigate nonpoint source contributions to reaches identified as water quality limited. |
| Humboldt | Nov 7, 1995 | 1. Nondesignated Area 208 Plan adopted TMDLs in 1993 for water quality impaired segments - these TMDLs may have oversimplified actual conditions.<br>2. Large scale mining activity is occurring in the basin.<br>3. Detailed nonpoint assessment currently being conducted. |
| Walker | Sep 13, 1985 | 1. Increased public and political interest.<br>2. Nondesignated Area 208 Plan adopted TMDLs in 1993 for non supporting segments.<br>3. Need to investigate nonpoint source contributions to reaches identified as water quality limited. |
| Snake River Basin | Sep 20, 1990 | 1. Need to obtain additional monitoring data. |

**Table One (cont.)**

| | | |
|---|---|---|
| Colorado Basin | | |
| Muddy River | Aug 1, 1985 | 1. Standards for Las Vegas Wash/Bay and Lake Mead currently being reviewed.<br>2. Established TMDLs for Las Vegas Wash.<br>3. Clark County and Las Vegas WWTF have constructed treatment facilities to meet NPDES permit limits.<br>4. Rapid population growth in the Las Vegas Valley.<br>5. NPDES permits for major facilities expired Jan 1997.<br>6. Unanswered questions about the role of nutrients and their impact on beneficial uses. |
| Virgin River | Aug 1,1985 | |
| Las Vegas Wash | Dec 17, 1987 | |
| Las Vegas Bay | Dec 17, 1987 | |
| Truckee River | Nov 29, 1993 | 1. Permit WLA violations.<br>2. Implementation of Water Quality Agreement and assessment of assimilative capacity of flow augmentation.<br>3. Opportunities for nonpoint/point source trading resulting from implementation of Water Quality Agreement. |

Accronyms:

| | |
|---|---|
| DO | = Dissolved Oxygen |
| $NH_3$ | = Un-ionized Ammonia |
| TDS | = Total Dissolved Solids |
| TMDL | = Total Maximum Daily Load |
| TP | = Total Phosphorus |
| TSS | = Total Suspended Solids |
| Temp | = Temperature |
| WLA | = Waste Load Allocation |
| WWTF | = Waste Water Treatment Facility |

TABLE TWO

## Nevada's Priority Ranking for TMDL Development

| River Basin | High Priority 0-2 Years | Medium Priority 2-5 Years | Low Priority 5-13 Years |
|---|---|---|---|
| Carson Basin | | review existing TP TMDL | metals*, turbidity* |
| Colorado Basin | | | |
| Virgin River | | | TP*, metals* |
| Muddy River | | | TP*, metals* |
| Las Vegas Wash/Bay | review existing TP and total ammonia TMDLs | | |
| Humboldt Basin | review existing TP & TSS TMDLs | turbidity*, metals* | |
| Snake Basin | | | as needed |
| Truckee Basin | | review existing TP, TN & TDS TMDLs | turbidity* |
| Walker Basin | revise WQS for pH | review existing TSS TMDL | TP*, iron* |

* Before developing a TMDL, additional monitoring will be conducted to confirm impairment due to these pollutants.

TDS = Total Dissolved Solids
TMDL = Total Maximum Daily Load
TN = Total Nitrogen
TP = Total Phosphorus
TSS = Total Suspended Solids
WQS = Water Quality Standard

# Current Status of TMDL Development

## Humboldt River:

The existing TMDLs for total suspended solids (TSS) and total phosphorus (TP) are included in Nevada's Nondesignated Areas 208 Plan. The methodology used to determine the existing TMDLs oversimplified a complex situation to the point that the existing TMDL appears to lack scientific validity.

NDEP devoted a considerable amount effort during the 1994-1995 planning period evaluating the existing water quality and the existing TMDLs. This effort focused on understanding, analyzing and describing the data in relation to the extreme variations in flow conditions that occur in the Humboldt River on an annual basis. NDEP has not yet been successful in developing a methodology which adequately addresses the dynamics of the Humboldt River, but anticipates that the results of studies in the Humboldt River Basin will assist with that task.

A modification to the 208 Plan was proposed in August, 1995. The modification added language to address the situation where a discharge would improve water quality in a segment that has been identified as requiring load reductions. This modification was public noticed and no formal comments were received.

The water quality standards for the Humboldt River were revised (November 1995). During 1996-1997, the revised TSS standard was not exceeded more than 25% of the time. As a result of revisions to the water quality standards for TP and TSS, the existing TMDLs need to be reevaluated. Developing appropriate TMDLs for the Humboldt River is a priority in this 2-year planning period.

The Humboldt River Basin is the focus of a number of studies. The following described studies could provide TMDL related information. In 1998, NDEP initiated a nonpoint source assessment of the Humboldt River which is anticipated to be completed by the end of 1998. This assessment is the first step in gathering additional information for developing phased TMDLs. In addition to NDEP's nonpoint source work, USEPA has funded the University of Nevada, Reno to conduct a variety of studies on the Humboldt River including sampling invertebrates, periphyton, water chemistry and assessing the physical habitat. The U.S.Fish and Wildlife Service, U.S.Geological Survey and Barrick Goldstrike are combining resources to conduct aquatic biota monitoring.

**Carson River:**

In early 1996, a draft Upper Carson River Watershed Plan was completed. The draft plan underwent an extended review during which time a number of stakeholder meetings were held to discuss revisions and future implementation. The Upper Carson River Watershed Plan provides baseline information, identifies problems and presents recommendations and opportunities for watershed stakeholders to voluntarily improve the watershed. The Carson Valley Conservation District has taken the role of watershed coordinator.

**Las Vegas Bay/Wash:**

During 1997, NDEP conducted a detailed review of the monitoring data and water quality standards for the Las Vegas Wash and Lake Mead. One of the conclusions of the standards review is that additional study is needed to understand the role of nutrients and their ultimate impact on water quality and beneficial uses. Las Vegas Wash, Las Vegas Bay and Lake Mead did not exceed any beneficial use standards more than 25% of the time during 1996 and 1997. Over the next two year planning period, NDEP plans to investigate the liminological questions that remain unanswered. On a parallel track with the liminological investigation, NDEP also plans to evaluate existing models and available data to determine if there is a model which could be used to better describe the hydrodynamics of the Wash/Bay system.

Also during 1997, Clark County completed a 208 Water Quality Management Plan Amendment for the Las Vegas Valley which has been approved by NDEP and USEPA. The main purpose of the 1997 Amendment is to include the effects of sustained regional growth and development, to incorporate a more inclusive nonpoint source section and to provide water quality planning to a horizon year of 2020. The 1997 Amendment includes the current TMDLs for total ammonia and total phosphorus.

**Truckee River:**

NDEP established TMDLs for TN, TP and TDS for the Truckee River in 1994. These TMDLs have been incorporated into the NPDES permit for the Truckee Meadows Water Reclamation Facility (TMWRF). During the period from 1994 until present, TMWRF has not been able to consistently meet the waste load allocation (WLA) for total nitrogen. The compliance problem is the result of snail infestation of the nitrification towers. The snails consume the nitrifying bacteria faster than the bacteria can grow. When the snails consume the bacterial populations down to low levels, the ammonia conversion to nitrates is severely diminished and nitrogen concentrations in the final effluent increases. A 1.8 million dollar nitrification tower modification, solely for the elimination of snails, was completed in December 1996. The modification involved major piping changes, installation of a new recycle pump

station and new chemical feed lines. Prior to this modification, there was no method to isolate any of the four existing towers from the final effluent discharge. The modification has allowed TMWRF staff to isolate nitrification towers so that different chemical treatments to eliminate snails could be performed on individual towers without affecting the discharge.

During the time period from December 1996 to the present, plant staff have conducted chemical/biological research to find the most effective snail treatment chemical without killing nitrifying bacteria growth on the tower media. Much progress has been made toward final effluent compliance. However, the facility is still not complying with the 500 lb/day total nitrogen waste load allocation. As a result of continued noncompliance with the permit limit for total nitrogen, NDEP issued a Finding of Alleged Violation and Order to TMWRF on November 14, 1997. The Order requires submittal of a multi-layered contingency plan and schedule that will ensure reliable performance of the nitrification facilities.

During the next 5 year planning period, the need may arise to revise the TMDLs in response to flow augmentation. The Water Quality Agreement which settles and dismisses pending litigation brought by the Pyramid Lake Paiute Tribe was signed October 1996. The Agreement provides for the acquisition of Truckee River water rights and augmentation of the flow of the Truckee River to improve water quality, habitat conditions and have the potential to increase the nutrient assimilative capacity of the Truckee River and reduce nonpoint source pollutant loading. If it can be determined that an increase in the assimilative capacity of the Truckee River has occured, a revision of the TMDLs may be necessary.

## *STATEWIDE OBSERVATIONS*

### Total Phosphorus

A relatively large number of waterbodies have been identified as impaired for total phosphorus (TP) throughout the state on both past and present 303(d) Lists. For many reaches, TP is the main or only parameter causing the waterbody to be listed as impaired. The standard of 0.1 mg/l annual average applies across much of the state. This standard is based on recommendations made in the Gold Book. These recommendations are not strongly supported in the Gold Book and are not identified as criteria, but rather as a "desired goal for the prevention of plant nuisances". Given the native soil conditions in the Great Basin and the topography that exists over much of Nevada, the suitability of the TP water quality standard must be questioned. It is clear that additional research is needed on the role of TP in eutrophication. Studies done on the Truckee River and Pyramid Lake have shown that, in fact, nitrogen rather than phosphorus is the limiting nutrient. Before a large amount of resources are devoted to developing TMDLs and control strategies, it is advisable to evaluate the suitability of the existing water quality standards.

### Copper

Using a strict interpretation of the methodolgy, (>25% exceedances, minimum of 4 samples) analysis of data in STORET would result in more than half of the monitored waters in the state being listed for exceedance of the copper water quality standard. The standard is based on hardness of the water. The softer (lower hardness) the water, the more strict the standard. The State Health Lab which analyzed samples collected from monitored waters, lacked precision close to the standard in soft waters. The state lab has rounded copper data to the nearest 10 ug/l; consequently, a data value reported as 10 ug/l could actually be anywhere from 5 ug/l to 15 ug/l. This data is not adequate to assess, with any degree of certainty, whether waterbodies are impaired for copper. In the summer of 1997, NDEP began utilizing the USEPA lab for analysis of metals samples. Initial results show much lower detection limits resulting in better precision near the water quality standard for soft waters. Very few samples analyzed by the USEPA lab have been above the detection limit for copper. NDEP will postpone listing decisions for copper, until a more complete data set based on the improved analytic results is available.

**303(d) List - 1998**

# CARSON RIVER BASIN

| REACH | NAC 445A. | POTENTIAL PROBLEMS | Existing TMDLs | Future TMDLs |
|---|---|---|---|---|
| **Bryant Creek near stateline** | 148 | copper[1], iron[1], nickel[1] | | |
| **E.Fork at state line to Hwy 395** | 150 | TSS[2], turbidity[2] | | |
| **E.Fork at Hwy 395 to Muller Ln** | 151 | TSS[2], turbidity[2] | | |
| **E.F. at Muller Ln to Genoa and W.F. at stateline to Genoa Ln.** | 152 | turbidity[2], TP | TP | TP[4] |
| **Genoa Lane to Cradlebaugh** | 153 | turbidity[3], TP | TP | TP[4] |
| **Cradlebaugh to Mexican Gage** | 154 | turbidity[3], TP | TP | TP[4] |
| **Mexican Gage to New Empire** | 155 | turbidity[3], TP | TP | TP[4] |
| **New Empire to Dayton Bridge** | 156 | TP, ***fish consumption advisory***[5, 6] | TP | TP |
| **Dayton Bridge to Weeks** | 157 | TP, mercury[5], ***fish consumption advisory***[5, 6] | TP | TP |
| **Weeks to Lahontan Dam** | 158 | TSS, TP, iron, mercury[5], ***fish consumption advisory***[5, 6] | TP | TP |
| **Stillwater** | 126 | mercury[5], arsenic, boron ***fish consumption advisory***[5, 6] | | |

[1] The most likely source of contamination is Leviathan Mine in California. USEPA is currently working on technical design options for a long term solution.

[2] TSS and turbidity exceedances are likely the result of record high flows in the Carson River in January 1997 during which damage to the river channel occurred. Before developing TMDLs, additional monitoring will be conducted to determine if there is non-flood related impairment.

[3] The water quality standard for turbidity changes from 10 NTU to 50 NTU at Dayton. The 10 NTU standard from Genoa to New Empire needs to be evaluated, especially since the existing TSS standard for these reaches does not reflect the same strictness. The beneficial use of a cold water fishery, the basis of the 10 NTU standard, currently is not being sustained and a use attainability analysis should procede any TMDL development.

[4] Revision of the TMDL is linked to Upper Carson Watershed Management Plan. Also, see statewide discussion about phosphorus.

[5] Carson River and Lahontan Reservoir are listed on the National Priorities List because of mercury contamination. TMDL components will be derived from the Superfund site analysis and cleanup plans.

[6] The latest result of mercury samples from the fillets of walleye, wipers (cross between walleye and striper) and white bass showed a major increase in mercury levels. The increase in mercury levels resulted in an expansion of the fish consumption advisory issued by the Nevada State Health Division.

**CARSON RIVER PROBLEMS ON 1996 LIST THAT ARE NOT ON 1998 LIST:**

| **Parameter** | **NAC 445A** | **Reason** |
|---|---|---|
| lead | 152, 155, 157 | Water quality standard not exceeded more than 25% of the time during the listing period. Improved sampling procedures probably the reason for decrease in violations of the standard. |

**CARSON RIVER PROBLEMS NEW ON 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| copper, iron, nickel | 148 | New monitoring data confirms suspected metals problem in Bryant Creek due to Leviathan Mine upstream |
| TSS, turbidity | 150, 151 | In January 1997, the Carson River experienced severe flooding. Peak discharge was larger than recorded for previous floods at almost all stations on the Carson River. Due to the devastation and associated repair and recovery period following the flood which occurred over at least a six to nine month period, suspended solids and turbidity water quality standards were exceeded. |
| TSS, iron | 158 | Same as listed above for 150 & 151 |
| fish consumption advisory | 156, 157, 158, 126 | Due to elevated levels of mercury in fish, the existing Lahontan Reservoir fish consumption advisory was expanded in September 1997 to include the Carson River below Dayton and all of the waters in Lahontan Valley. |

## 303 (d) List - 1998
# WALKER RIVER BASIN

| REACH | NAC 445A. | POTENTIAL PROBLEMS | Existing TMDLs | Future TMDLs |
|---|---|---|---|---|
| **Topaz Lake** | 161 | TSS[1], TP[1] | | |
| **W.F. at stateline to Wellington** | 162 | pH[2], TP[1] | | |
| **W.F. near Wellington to Nordyke Road** | 163 | pH[2], TP[1] | | |
| **Sweetwater Creek** | 164 | TP | | |
| **E.F. at state line** | 165 | pH[2], TP | | |
| **E.F. at state line to south of Yerington** | 166 | TSS[1], iron[1] | TSS | TSS[3] |
| **From confluence of the west and east forks to inlet to Weber Reservoir** | 167 | TSS[1], iron[1] | TSS | TSS[3] |
| **Weber Reservoir to inlet to Walker Lake** | 168 | pH[2] | | |

[1] TSS, TP and iron exceedances are most likely the result of record high flows in the Walker River in January 1997 during which damage to the river channel occurred. Before developing TMDLs, additional monitoring will be conducted to determine if there is non-flood related impairment.

[2] The water quality standards are in the process of being revised (from 7.0-8.3 to 6.5-9.0) to reflect USEPA's current criteria. The data indicates that the new standard will not be violated more than 25% of the time.

[3] The existing TMDL will be evaluated as part of the water quality standards review.

**WALKER RIVER PROBLEMS ON 1996 LIST THAT ARE NOT ON 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| lead | 162 | Water quality standard not exceeded more than 25% of the time during the listing period. Improved sampling procedures are probably the reason for decrease in violations of the standard. |
| pH | 164, 166, 167 | Previous standards violations were at the high end of the acceptable pH range. Increased flow may be the cause for lower pH values during '96-'97 and attainment of the water quality standard. |
| TP | 166, 168 | A re-examination of the '94-'95 data revealed that these reaches were listed in error for TP. |
| copper | 166 | This reach does not meet the minimum criteria for listing (see statewide copper discussion). |

**WALKER RIVER PROBLEMS NEW ON 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| TSS, TP | 161 | Standards violations occurred in March and May of both '96 and '97. These violations are most likely a result of an above normal snowpack and large spring runoff in both years. |
| TP | 165 | November 1996 had a unusually high TP value. If it were not for this one sample result, this reach would not be listed for TP. |
| TSS | 166 | Same as 161 above. |
| TSS | 167 | Same as 161 above. |
| iron | 167 | Unknown |

## 303(d) List - 1998
# TRUCKEE RIVER BASIN

| REACH | NAC 445A. | POTENTIAL PROBLEMS | Existing TMDLs | Future TMDLs |
|---|---|---|---|---|
| **E.McCarran to Lockwood** | 187 | TP, TN[1] | TN[4], TP[4], TDS[4] | |
| **Lockwood to Derby Dam** | 188 | TP[2], TN[1] , turbidity[3] | | |
| **Derby Dam to Wadsworth** | 189 | TP[2], TN[1], turbidity[3] | | |
| **Wadsworth to Pyramid Lake** | 190 | TP[2], TN[1], turbidity[3] | | |
| **Lake Tahoe at Sand Harbor** | 191 | TN[5] | | |

[1] The Truckee Meadows Water Reclamation Facility (TMWRF) has experienced operational problems due to the nitrification towers being invaded by snails which consume the nitrifying biological film. The annual average total nitrogen water quality standard was exceeded in 1996, but was met in 1997.

[2] The TMDLs at Lockwood are intended to ensure that the waters downstream are in compliance with the water quality standards.

[3] Existing water quality standard of 10 NTU is not consistent, in terms of strictness, with the existing TSS standard. Before developing TMDLs, long term trends in turbidity and the existing water quality standard need to be assessed.

[4] Planned flow augmentation, nonpoint source reduction, river restoration and water quality model enhancement may result in a revision to the existing TMDLs.

[5] Sample is taken in heavily used recreational area; consequently, violations probably represent localized conditions.

**TRUCKEE RIVER PROBLEMS ON 1996 LIST THAT ARE NOT ON 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| nitrite | 187 | Nitrite exceedances seen in '94 were a combination of extremely low flows and high levels of ammonia being discharged from TMWRF. Higher flows in '96 and '97 in addition to improvements to the effluent being discharged from TMWRF has resulted in the river attaining the water quality standard for nitrite. |
| TDS | 190 | Data for '96 and '97 is in compliance with the water quality standard. The improvement is most likely due to significant increases of flow in the river and resulting dilution of nonpoint sources both from surface and ground water. |

**TRUCKEE RIVER PROBLEMS NEW ON 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| turbidity | 187 | Possibly due to higher flows in both '96 and '97 |

**303(d) List - 1998**

# COLORADO RIVER BASIN

| REACH | NAC 445A. | POTENTIAL PROBLEMS | Existing TMDLs | Future TMDLs |
|---|---|---|---|---|
| **Virgin R. from Arizona stateline to Mesquite** | 175 | TP[1], boron[2] | | |
| **Virgin R. Mesquite to Lake Mead** | 177 | TP[1], boron[2] | | |
| **Muddy R. from source to Glendale** | 210 | TP[1], iron[3] | | |
| **Muddy R. at Overton** | 211 | arsenic[2] , boron[2] | | |

[1] During the next standard's review, it will be determined if the TP standard is appropriate and if TMDLs are required.

[2] Before developing a TMDL, additional data is needed to determine if boron and arsenic standards violations are the result of natural conditions.

[3] Data suggests that iron increases at higher flows, and therefore, may be naturally occurring. During the next standard's review, an evaluation will be made of whether standards violations are the result of natural phenomenon or man caused.

**COLORADO R. BASIN PROBLEMS ON 1996 LIST THAT ARE NOT ON 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| iron | 175, 177 | Only one sample had an iron concentration over the 1000 ug/l standard during the '96 - '97 review period |
| TP | 211 | Water quality standard was not exceeded during '96-'97 review period. This reach will be included in TMDL evaluation described above. |
| pH | 192 | pH did not meet the minimum criteria for listing during '96-'97 review period. |

**Colorado River Basin problems new on 1998 List:** none.

## 303(d) List - 1998
# HUMBOLDT RIVER BASIN

| REACH | NAC 445A. | POTENTIAL PROBLEMS | Existing TMDLs | Future TMDLs |
|---|---|---|---|---|
| **Osino to Palisade** | 204 | turbidity[1], TP, iron[3] | | |
| **Palisade to Battle Mountain** | 205 | turbidity[1], TP, iron[3] | TP, TSS | TP[2], TSS[2] |
| **Battle Mountain to Comus** | 206 | turbidity[1], TP, iron[3], lead[4,5] | TP, TSS, TDS | TP[2], TSS[2] |
| **Comus to Imlay** | 207 | turbidity[1], TP, iron[3] | TP, TSS, TDS | TP[2], TSS[2] |
| **Above Humboldt Sink** | 127 | iron[5], boron[5] | | |

[1] Turbidity exceedances appear to be occurring in the winter and spring. Before developing a TMDL, additional monitoring will be conducted to determine if exceedances are due to natural or man-made conditions.

[2] TMDLs will be reviewed and revised, if necessary, taking into account 1995 standards revisions and 1998 nonpoint source assessment.

[3] The relationship between flow and iron will be evaluated before proceeding with a TMDL.

[4] NDEP has initiated sampling to compare dissolved versus total lead concentrations. The listing is based on total recoverable data; however, the water quality standard is expressed as dissolved. Recent data suggests that lead is below detection limit.

[5] Ongoing and planned studies (see p.6) will better assist NDEP in evaluating whether impairment exists.

**HUMBOLDT RIVER PROBLEMS ON 1996 LIST THAT ARE NOT ON 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| lead | 205, 207 | Lead detected and exceeded water quality standard in only one sample during the '96 - '97 listing period. Improved sampling procedures is most likely the reason for the decrease in standards violations. |
| TSS | 205, 206, 207 | Water quality standard was revised in November 1995. Violations of current standard no longer meet the criteria for listing. The basis for the standard revision was to account for extreme variations in flow that occur annually on the Humboldt River. |
| arsenic | 127 | NDEP and USGS data both show no violations of the listing criteria of the aquatic life standard during the listing period. |
| lead | 127 | Lead was not detected during the '96-'97 listing period |

**HUMBOLDT RIVER PROBLEMS NEW ON THE 1998 LIST:**

| Parameter | NAC 445A. | Reason |
|---|---|---|
| turbidity, TP, iron | 204 | High flows in both '96 and '97 could be the cause of violations of water quality standards |

**303(d) List - 1998**

# SNAKE RIVER BASIN

| REACH | NAC 445A. | POTENTIAL PROBLEMS | Existing TMDLs | Future TMDLs |
|---|---|---|---|---|
| **Salmon Falls Ck.** | 216 | Temperature | | |
| **Shoshone Ck.** | 217 | Temperature | | |
| **Owyhee R. above Mill Ck.** | 222 | TSS, turbidity, TP, iron | | |
| **Owyhee R. at China Dam** | 223 | TSS, turbidity, TP | | |
| **Owyhee R. at Boney Lane** | 224 | TSS, turbidity, TP, iron | | |

Waters in the Snake River Basin have not been listed in the past because there was not adequate data. During the '96-'97 listing period, there were 6 samples which does meet the minimum number for listing. All TSS and turbidity listings are based on 2 out of 6 exceedances which occurred in March of both '96 and '97 with the exception of one turbidity exceedance in July at China Dam. Based on the small number of samples, NDEP does not feel that there is enough information to determine if TMDLs are warranted at this time.