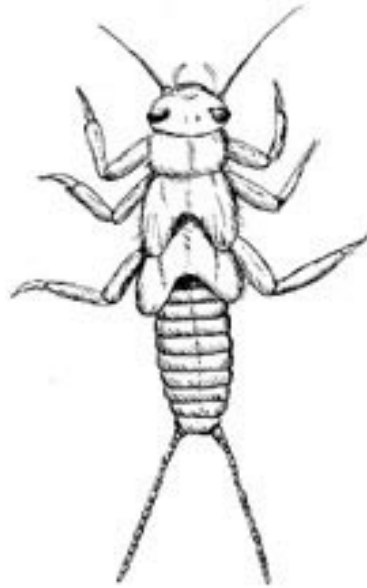


SECTION 303(d) LISTING METHODOLOGY 2012 Listing Cycle



Colorado Department of Public Health and Environment
Water Quality Control Division

March 2011

WQCD 2012 303(d) Listing Methodology
March 10, 2011

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SECTION 303(d) LISTING METHODOLOGY

2012 Listing Cycle

I. INTRODUCTION

Section 303(d) of the federal Clean Water Act (CWA) requires states to identify waters where effluent limitations mandated by Section 301(b)(1)(A) and Section 301(b)(1)(B) are not stringent enough to attain water quality standards. These waters are compiled into the Section 303(d) list of impaired waters. The Colorado Section 303(d) List identifies those water bodies, where there are exceedances of water quality standards or non-attainment of uses. This includes waters impaired as a result of non-point source, point source discharges or combined point source and non-point source contributions including natural sources. Total Maximum Daily Loads (TMDLs) are required for each listed water body. The 2012 Section 303(d) List is equivalent to Category 5 waters in EPA's *July 29, 2005 Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* (2006 Integrated Reporting Guidance), and the *October 12, 2006 Information Concerning 2008 Clean Water Act Sections 303(d), 305(b) and 314 Integrated Reporting and Listing Decisions*.

The 2012 Monitoring and Evaluation List (M&E List) identifies water bodies where there is reason to suspect water quality problems, but there is also uncertainty regarding one or more factors, such as the representative nature of the data. The M&E List contains water bodies that would be reflected in Category 2 or 3 of EPA's Integrated Reporting Guidance.

Waters that are on neither the Section 303(d) List nor the M&E List are:

- Attaining their uses and standards (EPA's Category 1);
- Have not been fully assessed (EPA's Category 2 or 3); or
- Impaired, but do not require a TMDL (EPA's Category 4)

EPA's Category 4 includes; impaired waterbodies for which TMDLs have been completed, but uses are not yet attained (4a); impaired waterbodies for which other required control mechanisms are expected to address all waterbody-pollutant combinations and will attain water quality standards in a reasonable period of time (4b); waterbodies that are impaired, but the impairment is not caused by a pollutant (4c).

Section II of this document identifies the process that the Water Quality Control Division (Division) and Water Quality Control Commission (Commission) intend to follow in establishing the Section 303(d) and M&E Lists. Section III contains the Listing Criteria and Section IV contains the Prioritization Criteria.

This document is intended to provide a framework for the determination of attainment or non-attainment of assigned water quality standards and designated uses. However,

there may be site-specific considerations not identified in the Listing Methodology that are appropriately factored into the final listing decision. Generally, the Division's recommendation to list or not list a waterbody will be based upon stringent application of the Listing Methodology criteria, but best professional judgment (BPJ) may be applied when necessary. Parties will have the opportunity to present mitigating evidence for the Commission's consideration as part of the rulemaking hearing process.

II. LISTING PROCESS

A. Development of the Methodology

The Listing Methodology is reviewed and updated on a biennial basis in anticipation of 303(d) List and M&E List development. Most often revisions or additions to the Listing Methodology derive from issues raised during the previous Listing process. The Listing Methodology is revisited and revised with the intent of clarifying the Division's procedures for assessing attainment of those uses and standards assigned by the Commission to Colorado waters.

The Division has solicited public participation to develop the 2012 Section 303(d) Listing Methodology through several means. The methodology for development of the 2006 and 2008 Lists was used as a starting point (however, the Listing Methodology began as the introduction to the 1998 Lists, later becoming a standalone document in 2002). The Listing Methodology is developed in a public process. Work group meetings to develop the 2012 303(d) Listing Methodology were held on June 29, 2010, August 18, 2010, September 29, 2010, October 13, 2010, November 9, 2010, November 30, 2010, December 15, 2010 and February 9, 2011 to address the needs of the 2012 listing cycle.

B. Process for Adopting the Methodology

The process for formal consideration and acceptance of the Listing Methodology was discussed at an April 2003 Commission meeting. The Commission at that time decided to convene an Administrative Action Hearing (AAH) process for adoption of the listing Methodology. Since the 2004 cycle, the Listing Methodology has been approved in an AAH process. The following schedule is anticipated for development and finalization of the 2012 Section 303(d) Listing Methodology:

- The Division proposal will be available for public review by about January 6, 2011 as an attachment to the notice of the March 8, 2011 public hearing on the Listing Methodology. It will also be available on the Commission's website, emailed to participants in the 303(d) Listing Methodology work group, and the notice will be published in the Monthly Water Quality Information Bulletin.

- The notice will establish a deadline of January 27, 2011 for written comments on the proposed Listing Methodology, including any recommendations for alternative language in the document. The comments received will be posted on the Commission's web site and copies will be available in the Commission Office.
- The notice will also establish a deadline of February 17, 2011 for any written rebuttal comments in response to the January 27, 2011 comments. These rebuttal comments will be posted on the Commission's web site and copies will be available in the Commission Office.
- If the initial written comments and/or the rebuttal comments warrant revisions to the proposed Listing Methodology, it will submit a revised proposal by February 23rd. This revised proposal will be emailed to the 303(d) Listing Methodology work group, posted on the Commission's web site and copies will be available in the Commission Office.
- No other written materials will be accepted for this hearing except by leave of the Commission, upon written explanation as to why such materials could not have been submitted in accordance with the above deadlines.
- An opportunity will be provided at the March 8, 2011 hearing for any interested persons to provide oral comments regarding the proposed Listing Methodology.
- At the conclusion of the March 8, 2011 Administrative Action Hearing, the Commission will modify, as necessary, and approve the final 2010 Section 303(d) Listing Methodology.

C. Process for Adopting the Section 303(d) and Monitoring & Evaluation Lists

The process for formal consideration and adoption of the Section 303(d) and M&E Lists was also discussed at the April 2003 Commission meeting. The Commission decided that the 2004 Lists, and subsequent lists, would be adopted through a public rulemaking process, with the following steps:

- Any person that has a Category 4b demonstration plan that wishes the Division to consider and submit to EPA must provide that information to the Division by May 2, 2011. (The Division will formally submit the plan to EPA by May 13, 2011)
- Any person that has data or other information that it wishes the Division to consider in determining which water segments and parameters to propose for listing or delisting (for either the Section 303(d) List or the M&E List) must provide that information to the Division by April 15, 2011. The Division will formally notice its solicitation of data, with instructions for its format, for consideration in development of the 2012 Section 303(d) List in January 2011.
- By June 13, 2011: External parties contact WQCD with suggestions for the 303(d) List and/or the Monitoring and Evaluation List.

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- By June 20, 2011: Division responds to the external parties regarding whether the segments in question will be in their proposal or not (giving external parties three weeks to develop their own proposal)
- Any person who wishes to propose the listing of water segments/parameters that may not be proposed by the Division must submit any such proposal, with accompanying proposed statement of basis and purpose language, to the Commission office by July 15, 2011. Any such proposal shall also include adequate information for the Commission to determine that listing of the segment/parameter should be considered in the rulemaking.
- A draft rulemaking hearing notice, with the Division's and any external proposals attached, will be prepared by the Commission Office, for inclusion in the Commission's August meeting packets. The draft notice and proposals will also be posted on the Commission's web site by about August 1, 2011, and will be emailed to the work group.
- The Commission will review the draft notice and proposals at its August 8, 2011 regular meeting, and approve them for filing.
- The rulemaking hearing notice and proposals will be filed with the Secretary of State by August 30, 2011. The final notice and proposals will also be posted on the Commission's web site by about this date, and will be emailed to the 303(d) Listing Methodology work group.
- Any person that has a Category 4b demonstration plan that missed the first deadline on May 2, 2011, may still submit the plan to the Division by August 30, 2011. (The Division will formally submit the plan to EPA by September 9, 2011)
- The rulemaking notice will include contact information for persons wishing to get more detailed information regarding the data or other information supporting the listing proposals advanced by the Division or other persons.
- The rulemaking hearing notice and proposal will be published in the September 2011 Colorado Register.
- The notice will establish a party status deadline of about September 27, 2011.
- Written Proponent's Prehearing Statements will be due by October 5, 2011.
- Responsive Prehearing Statements and any evidence (data and any other relevant information) regarding the appropriateness of listing the segments noticed for potential listing will be due by November 2, 2011.
- This November 2, 2011 deadline for the submission of evidence (data and any other relevant information) will apply to any information from any interested persons, not just those with party status.
- A prehearing conference will be held during the week of November 7, 2011.
- The notice will provide an opportunity for the submission of written rebuttal statements, in response to the November 2, 2011 submissions, by November 30, 2011. No new data or other new factual information will be accepted after November 2, 2011 but the rebuttal statements may contain different analyses and perspectives regarding what the submitted information shows regarding attainment and the appropriateness of listing and may include additional information solely to rebut or respond to information filed with another party's responsive prehearing statement.

- Any data or other information that is not submitted in accordance with the above deadlines will be considered in the next listing cycle.
- The Commission's rulemaking hearing will be held on December 12, 2011. At the conclusion of the hearing, the Commission will approve the 2012 Section 303(d) List and the Monitoring and Evaluation List as Regulation No. 93.

D. Process for Revising the Section 303(d) and Monitoring and Evaluation Lists

This document addresses in detail the procedures and protocols utilized by the Division in assessing information for the purpose of identifying instances of non-attainment of water quality standards and, subsequently, inclusion of affected waterbodies on either the 303(d) or M&E List. In general, removal of waterbodies/pollutants from either list is subject to the same requirements as those utilized for addition to the Lists. Removal from the Lists is considered appropriate where new information is developed which indicates that water quality standards are being met and/or designated uses are being attained. Considerations include more recent or more accurate data (for instance, chemical data generated using “clean” sampling/analytical methods), more sophisticated analysis using a calibrated model, identification of deficiencies in the original assessment or changes in standards, guidance or policy.

In general, sampling frequency and number of sampling events should be similar to, or greater than, that which was used as a basis to list the segment (an exception would be in the instance where data collected utilizing conventional methods is supplanted by clean-methods data or where the listing decision was based upon special study results for which it is impractical to reproduce). In any case data must be adequate to characterize current water quality conditions. Assessments demonstrating attainment of designated uses should provide documentation of a nature similar to that used to support the listing decision. Attainment of water quality standards and uses will result in removal of the waterbody, or one or more listed parameters, from the List.

The Commission will also consider removal when “good cause” is shown. As described in EPA’s **2006 Integrated Reporting Guidance**, “good cause” for removing a water body (or water body pollutant combination) from the Lists includes:

- The assessment and interpretation of more recent or more accurate data in the record demonstrate that the applicable classified uses and numeric and narrative standards are being met.
- The results of more sophisticated water quality modeling demonstrate that the applicable classified uses and numeric and narrative standards are being met.

- Flaws in the original analysis of data and information led to the water body pollutant combination being incorrectly listed.
- Demonstration pursuant to 40 CFR 130.7(b)(1)(ii) that there are effluent limitations required by state or local authorities that are more stringent than technology-based effluent limitations, required by the CWA, and that these more stringent effluent limitations will result in attainment of classified uses and numeric and narrative standards for the pollutant causing the impairment.
- Demonstration that there are other pollution control requirements required by State, local or federal authorities that will result in attainment of classified uses and numeric and narrative standards within a reasonable time. (This element constitutes EPA's Integrated Reporting Category 4b.)
- Documentation that the State included on a previous Section 303(d) List an impaired water that was not required to be listed by EPA regulation, e.g. waters where there is no pollutant associated with the impairment (This element constitutes EPA's Integrated Reporting Category 4c).
- Approval or establishment by EPA of a TMDL since the last Section 303(d) List.
- Inappropriate listing of a water that is located within Indian lands as defined in U.S.C. § 1151 (Indian Country Defined).
- Other relevant information that supports the decision not to include the segments on the Section 303(d) List (i.e. adoption of revised water quality standards and/or uses such that the water is now in attainment of the revised standards and/or uses; or development of a new listing methodology consistent with the State water quality standards and classifications and federal listing requirements, and a reassessment of the data that led to the prior listing, concluding that the water body is no longer impaired.)

Barring unforeseen circumstances, the Division will only propose to revise the Lists during the regularly scheduled reviews (currently biennially). Other interested persons may petition the Commission at any time to request a rulemaking hearing to revise the Lists (either additions or deletions). However, such a hearing will be held only upon a showing that failing to either add a segment to the list or delete a segment from the list prior to the next scheduled review will result in a substantial hardship to the party or parties requesting the hearing.

E. Process for Determining Category 4b Classification

An alternative to listing an impaired segment on the State's 303(d) List is an approved Category 4b demonstration plan. A Category 4b demonstration plan, when implemented, must ensure attainment with all applicable water quality standards through agreed upon pollution control mechanisms within a reasonable time period. These pollution control mechanisms can include approved compliance schedules for capital improvements or plans enforceable

under other environmental statutes (such as CERCLA) and their associated regulations. A Category 4b demonstration can be used for segments impaired by point sources and/or nonpoint sources. Both the WQCD and EPA must accept a Category 4b demonstration plan for the affected segment to be placed in Category 4b. In the event that the Category 4b demonstration plan is not accepted, the segment at issue will be included on the 303(d) List, Category 5.

Generally speaking, the following factors will be considered necessary for Category 4b demonstration plan acceptance: (1) appropriate voluntary, regulatory or legal authority to implement the proposed control mechanisms (through permits, grants, compliance orders for Colorado Discharge Permit System (CDPS) permits, etc.); (2) existing commitments by the proponent(s) to implement the controls; (3) adequate funding; and (4) other relevant factors appropriate to the segment.

The following evidence must be provided as a rationale for a Category 4b demonstration plan:

- 1) A statement of the problem causing the impairment;
- 2) A description of
 - a. the pollution controls to be used
 - b. how these pollution controls will achieve attainment with all applicable water quality standards
 - c. requirements under which those pollution controls will be implemented;
- 3) An estimate of the time needed to meet all applicable water quality standards;
- 4) A schedule for implementation of the necessary pollution controls;
- 5) A schedule for tracking progress, including a description of milestones; and
- 6) A commitment from the demonstration plan proponent to revise the implementation strategy and pollution controls if progress towards meeting all applicable water quality standards is not shown.

Timing for proposal submittal and acceptance by WQCD and EPA

- Category 4b demonstration plans should be submitted to the Division by May 2, 2011 in order for the Division to submit the plan to EPA by May 13, 2011. Parties are encouraged to work with the Division at least one week prior to this date as states are the entity required to submit these plans to EPA.
- Acceptance from EPA must be obtained by July 15, 2011 otherwise the Division will propose that the segment in question is included on the 2012 303(d) List.

- If EPA and the Division accept the Category 4b Plan, the Division will notify the Commission and public through proposed Statement of Basis and Purpose language in its proposal that a Category 4b demonstration plan is accepted and is appropriate for this segment. The Category 4b demonstration plan should be included in the proponent's Prehearing Statement.
- If the deadline of May 2, 2011 is not met, parties can submit Category 4b demonstration plans to the Division by, August 22, 2011 at the latest for consideration in the December 2011 rulemaking hearing. Again, parties are encouraged to work with the Division at least one week prior to this date as states are the entity required to submit these plans to EPA. The Division will submit the plan to EPA by September 5, 2011. This allows adequate time for EPA and the Division to review the plan and make a determination prior to the rulemaking hearing in December 2011.
- Category 4b demonstration plans should be included in the party's Responsive Prehearing Statement.

EPA has several documents that contain additional information on Category 4b demonstration requirements, including: "2006 Integrated Report Guidance," available at <http://www.epa.gov/OWOW/tmdl/2006IRG/#documents>; and "Information Concerning 2008 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions," available at: <http://yosemite.epa.gov/R10/WATER.NSF/TMDLs/CWA+303d+List/>.

III. LISTING CRITERIA

This Listing Methodology sets forth the criteria that generally will be used to make decisions regarding which waters to include on the 2012 Section 303(d) List and the 2012 M&E List. However, this methodology is not adopted by the Commission as a rule. The Commission will not be bound by the criteria set forth in the Listing Methodology in making individual listing decisions if it determines on a site-specific basis that an alternative approach provides a more appropriate method for assessing attainment of water quality classifications and standards in a particular circumstance.

A. Existing and Readily Available Data

In determining whether data and information is existing and readily available, the Division will take into account such data and information as it has utilized in the preparation of those identification processes, calculations, and models referenced in 40 CFR §130.7(b)(5)(i), (ii) and (iv) and that credible data and information presented in a readily usable format and submitted in reports provided to the Division as referenced in 40 CFR §130.7(a)(5)(iii). In addition, the Division will accept and take into consideration credible data and information

that is timely submitted to the Division as part of the listing process, whether submitted by EPA or any other interested party. The Division will also continue to independently collect and analyze new data on a rotating basin basis as part of its triennial review efforts and will utilize such data and information in making Listing determinations. Existing data, which are not brought forward through one of the above mechanisms or otherwise presented to the Division in accordance with the schedule, set out in Section II.C, above, will not be treated as "readily available" for purposes of making listing decisions. Such information will be considered in the next listing cycle.

It is important that data submitted for consideration in the 303(d) List development process be in a form that is amenable to existing Division data management capabilities. Chemical data that are submitted for consideration in the List development process should be submitted in an electronic, STORET-compatible format. Physical and biological data should be submitted in a common electronic format that is amenable to statistical manipulation. Recommended data reporting templates will be available at the time of the data request in January 2011. The Division should be consulted regarding alternate formats. Data that are submitted in hard copy or alternate electronic format will be considered subject to Division resource limitations, but may not be included in the Division's assessment or proposal.

The assessment process described is intended to provide continuity with similar assessments done to support the standards review process as well as to efficiently utilize Division resources. The Division uses a "rotating basin" approach, approved by EPA, for periodic standards review and coordinates water quality monitoring and assessment to support the review. The following schedule sets out the relationship between the basin reviews and when assessments generated by those reviews will be incorporated in the 303(d) Listing process for the first time.

Table 1 Timeline of the standards review and 303(d) list cycle by basin.

COORDINATION BETWEEN THE STANDARDS REVIEW SCHEDULE AND SECTION 303(d) LIST CYCLE			
River Basins (Regulation Number)	Data Collection Effort	Standards Rulemaking Hearing	Assessments Incorporated into 303(d) List Cycle for first time
San Juan, Dolores & Gunnison (#34 & #35)	July 2004 - June 2005	June 2006	2008
Arkansas & Rio Grande (#32 & #36)	July 2005 - June 2006	June 2007	2008
Colorado Basin (#33 & #37)	July 2006 - June 2007	June 2008	2008
South Platte (#38)	July 2007 - June 2008	June 2009	2010
San Juan, Dolores & Gunnison (#34 & #35)	July 2009 - June 2010	June 2012	2012
Arkansas & Rio Grande (#32 & #36)	July 2010 - June 2011	June 2013	2014
Colorado Basin (#33 & #37)	July 2011 - June 2012	June 2014	2014

B. Credible Evidence

The water quality assessment process depends on analysis of sufficient reliable data. Listing decisions not supported by adequate data are potentially flawed. The listing criteria are intended to assure that only those waterbodies for which adequate documentation of non-attainment is available are included on the Section 303(d) List. Waterbodies for which there is evidence to suggest impairment, but for which such documentation does not meet the standards for credible evidence, will be placed on the M&E List unless good cause is shown that it should be included on the 303(d) List.

Water bodies may be included on the Section 303(d) List based on an evaluation of biological, chemical or physical data. The Division will consider proposing to list a water body based upon consideration of all chemical, physical, and biological information that meets established sampling, analytical, and interpretive protocols. Considerations include a review of the sampling and analytical methods employed. Factors to be considered include analytical detection limits, sample size (see section D.2.k), spatial and temporal distribution (see section C.5), variability within the data set, and the use of “clean” methods. Listing is often based upon chemical data alone, subject to the data interpretation criteria identified within this document. Listing based upon biological or physical

data in the absence of accompanying chemical data requires that such information clearly demonstrate use impairment. Representative data of each type will be sought and utilized whenever possible, especially where use impairment is the potential basis for the listing decision.

The following guidelines are used to evaluate the adequacy of water quality information as a basis to support listing a waterbody.

1. Data Requirements – General

Information must be available to describe the methods used for sample collection, field, and laboratory analysis. Persons submitting data for consideration during the list development process must either provide the relevant quality assurance documentation with the submittal or assure that the documentation is available for the Division to review.

The party submitting the data for consideration should provide the following information accompanying their data submission:

- Written assurance that the methods and procedures specified in the QA plan were followed.
- Any field notes, laboratory comments, or laboratory notations concerning a deviation from standard procedures, quality control, or quality assurance that affects data reliability, data interpretation, or data validity may be requested by the Division.
- Statement of the analytical methods used by the laboratory, method number, detection limits, quantitation or minimum levels, if available, and any quality control samples and standards necessary to properly interpret data different from that stated in the QA plan.
- If requested by the Division for interpreting or validating data, any other information, such as complete field notes, photographs, climate, or other information related to flow, field conditions, etc... This information should be retained by the submitter for a period of at least 5 years.
- Field instruments, such as multi-parameter devices, must be operated and calibrated according to manufacturer's recommendations, or other acceptable demonstrated method. Calibration information and any other documentation of accuracy may be requested by the Division.

Minimum information required for each data submittal must include the following:

- Location of each sample station in latitude and longitude with the associated reference datum, e.g., North American Datum 1983, etc.
- Waterbody name and sampling location description
- Date the sample was taken
- Parameter or condition measured
- Measured value
- Unit of measurement
- For non-detect or non-quantifiable data, the “less than” value associated with the method detection limits or practical quantitation limits
- Method used to measure the pollutant
- Name of the party submitting the data

Data submittals must include precise, sufficient information on the name of the waterbody and location of the sample station to allow for accurate mapping.

2. Sampling and Analysis Plans

Chemical data should be supported by a Sampling and Analysis Plan (SAP), which identifies sampling locations, contains analytical method references, and incorporates Quality Assurance/Quality Control (QA/QC) provisions. QA/QC documentation may include references to a standard QA/QC protocol. During review of chemical data submitted for evaluation, the Division may require submittal of the SAP, QA/QC protocols and the results of QA/QC efforts. The Division will provide any such information to other parties upon request.

3. Toxicity Tests

In-situ bioassay test results, or other ambient toxicity test results, must demonstrate adverse effects as measured by a statistically significant response relative to a representative reference or control. Inherent variability in toxicity testing results must be adequately taken into account. Listing decisions based upon toxicity test results require that any such results be corroborated by biological information clearly demonstrating impacts to aquatic community health, composition, or productivity. Data received utilizing WET methods will be considered on a case by case basis.

4. Physical and Biological Assessment

a.) Physical and biological assessments must be performed in accordance with scientifically sound methodologies. All such assessments should be performed by an observer who has training and experience in performing

such evaluations. Assessment reports should include a statement of the observer's qualifications and should reference the protocols utilized. Any departures from referenced protocols and methodologies should be documented and the basis for any such departure addressed. The Division's recommended collection and assessment methodologies for physical and biological data are WQCC's Policy 98-1, *"Implementation Guidance for Determining Sediment Deposition Impacts to Aquatic Life in Streams and Rivers"* and Policy 10-1, *"Aquatic Life Use Attainment, Methodology to Determine Use Attainment for Rivers and Streams."* A description of the Division's assessment procedure is included in section III.C.3.

b.) The Division will generally accept methodologies and protocols in use by the U.S. Geological Survey, U.S. Forest Service, U.S. Bureau of Land Management, U.S. Environmental Protection Agency, Colorado Division of Wildlife, or others, when well-documented, widely available and suitable for their intended purpose. The Division's determination of the acceptability or unacceptability of any such protocol will be included in the Division's discussion of data sources that the Division includes in the Section 303(d) List.

5. Period of Record

The "call for data request" will be announced and will be open for approximately 3 months. Data and other information received will then be assessed for the next water quality assessment session and results will then be announced for public review and comment in the draft rulemaking hearing notice.

Data collected within the dates specified in the call for data request may be submitted for consideration into the assessment. In general, information and data should be no older than 5 years. Data which are less than 5 years old and meet the other credible data requirements outlined in this listing methodology will be consolidated and assessed with other data.

Data older than 5 years must meet all current data requirements and will only be considered on a case-by-case basis for the following reasons:

- No newer data exists for the waterbody segment/parameter or the existing data does not meet the requirements of this listing methodology,
- The data are part of a larger dataset or long-term monitoring which includes data younger than 5 years old for the same waterbody/parameter,
- Information or rationale is provided with the data to show that the data reflects current conditions and adherence to acceptable protocols.

Data older than 5 years may be used when necessary to determine historical natural conditions if the data meets the QA requirements in place at the time of its collection.

Data submitted after the 3 month deadline stated in the “call for data request” will not be considered for the current assessment/listing cycle. Any late data accepted after the data request deadline will be put into consideration for the next assessment/listing cycle.

6. Anecdotal Information

Anecdotal information, in the absence of chemical, physical, or biological data, will not in and of itself be adequate to support a listing decision unless such information provides clear and convincing evidence demonstrating non-attainment. Anecdotal information includes, but is not limited to fishing logs, field logs, and historical or archival documents.

7. Representative data

Data collected during or immediately after temporary events influencing the waterbody that are not representative of normal conditions shall typically be discounted in making the listing decision (see the **Basic Standards and Methodologies for Surface Water**, 5 CCR 1002-31, §31.7(1)(b)). For example, low frequency storm events (e.g. 100 year events) which scour the stream, leading to diminished aquatic life use, or accidental spills of toxic chemicals would not be a basis upon which to list the affected segment. However, such events may be considered as a basis for listing in instances where non-attainment of standards arises from a reversible source of pollutants.

C. Data Interpretation

The water quality assessment process considers the numeric and narrative standards assigned to a segment, as well as the assigned use classifications. Numeric standards are identified for a given pollutant and are expressed as a threshold value or as an acceptable range of values. Determination of attainment/non-attainment of pollutant specific numeric standards is a relatively straightforward statistical process.

Narrative standards describe threshold conditions that, if exceeded, result in unacceptable water quality conditions. Narrative standards that are applied to all surface waters in Colorado address sediment, floatables, film, odor, taste, color, toxins, and excessive nutrients. Narrative standards may also include site-specific temperature standards as provided at section 31.7(1)(c) of the **Basic Standards**. Exceedance of narrative standards is more difficult to ascertain, as

there are typically no quantifiable expressions of parameter concentration or loading that result in non-attainment. It is often the impact of pollution or of a pollutant, and not the pollutant itself, which is observed.

Use classifications identify existing or potential uses of the surface water segment. These include aquatic life, water supply, recreation and agricultural uses. Specific numeric standards are attached to a given use classification. Assignment of an aquatic life use classification to a segment typically results in assignment of a related suite of numeric standards. Attainment of numeric standards serves as a surrogate measure indicating attainment of the assigned use classification. However, non-attainment of an assigned use classification, as with narrative standards, may result from causes or parameters other than those assigned numeric standards.

1. Chemical Data - General

The Division determines attainment of numeric standards by assessing data against the standards for development of the list. Additional criteria utilized in assessment of data developed for lakes and reservoirs are also noted.

a. Attainment of Chronic Standards

Attainment of chronic chemical standards, in both streams and rivers, and lakes and reservoir systems, is based upon the 85th percentile of the ranked data, except as otherwise noted below. Percentile values are calculated by ranking individual data points in order of magnitude. Hardness-based metal standards are evaluated by comparing the 85th percentile against the assigned hardness-based equation using the mean hardness. Total recoverable metals are evaluated against the median value, or the 50th percentile. Dissolved metals are evaluated against the 85th percentile. Dissolved oxygen (DO) is evaluated at the 15th percentile for streams. Minima pH is evaluated against the 15th percentile, maxima at the 85th percentile.

Hardness based metals standards may also be evaluated by a detailed assessment where the chronic Table Value Standard is calculated for each paired hardness/concentration data and attainment is determined for each data pair.

b. Attainment of Acute Standards

Acute standards are evaluated by comparison of single sample values to the assigned standard. Review of acute hardness-based metals criteria is a two step process. A preliminary screening of the dataset is accomplished by comparison of the maximum recorded parameter value against the acute standard calculated using the mean hardness. An exceedance of the mean hardness-based standard by the maximum constituent concentration

triggers a detailed assessment where the acute Table Value Standard is calculated for each paired hardness/constituent value set and attainment is determined for each data pair. Where paired hardness and concentration data is not available an assessment of the acute standards cannot be completed.

c. Spawning Season DO Criteria

Spawning season DO criteria, when assigned by the Commission, are generally applied for the period between mid-October through July (dependent upon species present and basin). Attainment of the spawning season DO standard is evaluated through a two step process. An initial screening is performed by comparison of the 15th percentile DO value to the 7.0 mg/L spawning season-based standard. In instances where the 15th percentile value for the entire dataset is less than the 7.0 mg/L seasonal standard, the dataset is subdivided into spawning/non-spawning values and the 15th percentile value for the spawning season data is compared to the spawning season criterion. The Division will generally utilize spawning season information as provided by Division of Wildlife on a basin specific-basis (see Attachment 1). Where more detailed fishery community information is available, the Division will consider alternate spawning seasons as supported by such data.

d. Detection Limits

Sample data that are below detection limits will, in general (except coliform data), be treated as zeroes for assessment of attainment.

e. E.coli Standards

Attainment of the *E.coli* standard is assessed using the geometric mean of representative stream samples. Notwithstanding the criterion at item d above, *E.coli* data that are reported as less than detect will be treated as a value of one to allow calculation of a geometric mean.

f. Sample Bias

Assessment techniques will be used that seek to reduce the effects of biased sampling. For example, the median of multiple samples taken within a seven-day period will be used to represent that time period, and information gathered during synoptic (sampling at many locations at the same time) sampling events may be considered in a separate assessment so as not to bias the conclusions.

2. Sampling Data - Lakes and Reservoirs

The sampling strategy appropriate for lakes differs from that for streams in important ways that affect the assessment of water quality. Typically, lakes are not sampled as often as streams because the large volume of water buffers against the short-term changes in quality. In contrast, the spatial coverage within the vertical profile should be generally more comprehensive for lakes, especially where lakes are stratified in the summer.

Two strategies typically are applied simultaneously when sampling lakes – vertical profiles and discrete samples. It is common to measure some parameters (usually temperature, dissolved oxygen (DO), pH and conductance) in vertical profiles that yield measurements at closely-spaced intervals from top to bottom in a lake or reservoir. Profile data are essential for defining the internal boundaries of layers that form when thermal stratification develops in the summer months, or for demonstrating that no stratification exists. The preferred sampling location for lake and reservoir profiles is in the deeper part of the lake or reservoir.

Profile Data

The interpretation of profile data begins by examining the “mixed layer,” which is that part of a lake that is well-mixed by wind action and can be expected to have relatively homogenous physical and chemical conditions. For assessment purposes, the mixed layer is evaluated by examining conditions in the upper portion of a lake. The upper portion is generally characterized within a single profile as follows:

1. Where a lake or reservoir is equal to or greater than 5 meters deep, measurements within a single profile are generally assessed as the average of all measurements from 0.5 meters to 2.0 meters.
2. Where a lake or reservoir is less than 5 meters deep, but more than 1.25 meters deep, measurements within a single profile are generally assessed as the average of all measurements from 0.5 meters to a depth equal to 40% of the total depth.
3. Where a lake or reservoir is 1.25 meters deep or less, measurements within a single profile are generally assessed as the median of all measurements.

In a stratified lake, the upper portion is separated from a deeper, cooler layer (referred to as the lower portion) by a transition zone of rapid temperature change (thermocline).

The lower portion of a lake is assessed by averaging the measurements from 1-3 meters above the bottom of the lake. For example, to assess the lower portion of a lake with a maximum depth of 6 meters, profile measurements would be averaged from 3-5 meters. For lakes less than 5 meters deep, the lower portion is not assessed. This definition for the lower portion of lake is only used for the purpose of pH assessment.

In cases where multiple data points along a profile are not available or feasible and only single data points are collected, a single data point from each of the upper and lower portions may be assessed against the standard, if the single data points are determined to be representative.

Discrete Samples

Discrete samples are used to characterize conditions at specific depths, often intended to represent a single layer. Discrete samples from lakes are analogous to grab samples taken for stream assessments. It is common to take samples from the top and bottom of each lake (which would correspond to upper and lower portions in a stratified lake) because the water quality characteristics of those two major habitat regions often diverge significantly during the growing season. It is much less common to take discrete samples from the thermocline for two reasons: it is a boundary zone with steep environmental gradients, and water quality characteristics will be intermediate between those of the adjacent layers.

a. Temperature

Vertical profiles provide a record of temperature at closely-spaced intervals from the top to the bottom of the water column. Unlike streams, daily fluctuation of temperature in lakes tends to be quite small. Thus, the temperature observed at each depth in the profile is assumed to be persistent on a scale of days, making it a surrogate for the weekly average temperature (WAT). The Division examines attainment first in the upper portion, as defined above to represent the mixed layer referenced in Regulation 31 (footnote 5.c.iii). If the average temperature in this upper portion exceeds the chronic standard, temperatures below the upper portion are evaluated when there is need to consider adequate refuge. Adequate refuge depends on concurrent attainment within a given depth of the temperature standard and applicable dissolved oxygen standards (Regulation 31, Table 1, (footnote 5.c.iii)).

b. Dissolved oxygen

Assessment of dissolved oxygen within a profile of a lake or reservoir is accomplished by comparing the average of the measurements from the upper portion of the lake, as defined above, to the applicable standard. In the lower portion of a lake, dissolved oxygen may be less than the applicable standard except where a site-specific standard has been

adopted, or where adequate refuge is necessary for assessment of the temperature standard.

Fall turnover exclusion: Dissolved oxygen may drop 1 mg/l below the criteria in the upper portion of a lake or reservoir for up to seven consecutive days during fall turnover provided that profile measurements are taken at a consistent location within the lake 7-days before, and 7-days after the profile with low dissolved oxygen. The profile measurements taken before and after the profile with low dissolved oxygen must attain the criteria in Table 1 in the upper portion of the lake or reservoir. The fall turnover exclusion does not apply to lakes or reservoirs with fish species that spawn in the fall unless there are data to show that adequate dissolved oxygen is maintained in all spawning areas, for the entire duration of fall turnover.

c. pH

Data for pH often are available from vertical profiles, but the data are generally evaluated in the context of discrete samples. There are two reasons for this approach – not all sampling programs obtain pH in profiles, and pH must be determined for any discrete sample wherever ammonia is of interest. Discrete samples from the upper and lower portions are evaluated separately because they represent different habitat regions in a stratified lake. When variations in pH are driven largely by biological processes within a lake, the risks of exceedance are generally associated with high pH in the upper portion (due to high rates of algal productivity) and low pH in the lower portion (due to high rates of decomposition).

Assessment of the pH standard for a lake is accomplished by calculating the average pH from the upper and lower portions of the lake for each profile as defined above. The 15th and 85th percentiles of the sample averages for each portion are then compared to the minima and maximum pH standard for the determination of attainment.

d. Metals and Inorganics

These constituents are generally assessed on the basis of discrete samples, for which the methods for data interpretation have been outlined above. For the reasons explained under the subsection on pH, discrete samples from the upper and lower portion of a lake should be assessed separately.

3. Biological and Physical Data

Biological and/or physical assessment protocols may support a determination of non-attainment of numeric standards or, alternately, non-attainment of narrative standards and classified uses. The Division, in interpreting physical and biological information, will give site-specific consideration to the applicability of the protocols in use and available

metadata gathered to validate the information generated, the extent and nature of expertise of the observer, and the relative weight of the evidence presented.

In general, a determination that an assigned aquatic life use is not supported will be consistent with the protocols established in WQCC Policy 10-1, *“Aquatic Life Use Attainment, Methodology to Determine Use Attainment for Streams and Rivers.”*

Physical and biological assessments will consider measurable conditions or features within an affected segment in comparison to an “expected condition.” The expected condition generally will be based upon a selected reference condition. Identification of reference conditions requires consideration of the level of disturbance (minimal), location (upstream, downstream, or within a separate drainage), historical condition, expected condition based on modeling or general expectations for highly managed systems, or other fair and reasonable comparison. Determination of reference conditions based upon sampling/assessment of multiple reference sites, when possible, is preferable but not required.

Impairment of aquatic life use classifications or narrative toxicity standards will be demonstrated, for the limited purpose of listing, when either the physical/habitat data or biological community metrics reflect a condition that is significantly less than reference condition, or as outlined in the WQCC Policy 10-1.

The Division’s assessment process includes documentation of data sources, an evaluation of the validity of the data, the appropriateness of the methodologies utilized, and whether the data are representative. This latter element considers spatial and temporal variability in the dataset, as well as the age of the data, any relevant changes within the watershed that might affect the interpretation of the dataset, and any bias which might be inherent in the sampling plan. If the dataset for the affected reach is found to be representative and valid, a comparison is made to an expected condition. The expected condition may be defined by actual conditions upstream, or downstream of the affected reach, or may be defined by a comparable reach located in a differing drainage or watershed. Alternately, the expected condition may be developed based upon biocriteria, modeling or professional judgment. Any assessment must describe the basis for defining the expected condition.

When an assigned aquatic life use is determined to be impaired, listing will be made consistent with the procedures outlined in Section D.1, Determination of Impairment.

In instances where aquatic life use impairment is demonstrated by biological assessment, the data will be interpreted, when appropriate, as outlined in the Aquatic Life Use Attainment- Methodology to Determine Use Attainment for Rivers and Streams, WQCC Policy 10-1.

In instances where aquatic life use impairment is the result of excessive sediment deposition, the interpretation of such data will be as outlined in the **Implementation Guidance for Determining Sediment Deposition Impacts to Aquatic Life in Streams and Rivers**, Commission Policy 98-1.

4. Outstanding Waters

Attainment of water quality standards assigned for those segments designated as Outstanding Waters will be based upon the evaluation of ambient water quality characteristics and biological /physical data as described in the preceding paragraphs C.1, C.2 and C.3. Attainment or “maintenance and protection at their existing levels” is assessed by comparison of current ambient water quality against water quality conditions at the time of designation. (See **Basic Standards and Methodologies for Surface Water**, 5 CCR 1002-31, section 31.8(1)(a)). The time of designation can usually be found in the Statement of Basis and Statutory Basis in the basin regulation for the segment in question.

5. Assessment of Temperature Data

Numerical temperature standards are evaluated against representative instream data. Temperature varies within a reach both spatially and temporally, e.g. summer and winter. Data should be taken from a location in the stream that is representative of the reach at the time the data are collected. For example, data should not be relied upon that are taken only in locations that may be substantially warmer or cooler than the rest of the segment – e.g. backwater habitats, eddies, deep pools, or refugia.

a. Seasonal Maxima

- i. Chronic: Attainment of the chronic numerical temperature standard is based upon a Maximum Weekly Average Temperature (MWAT), unless otherwise specified in a site-specific standard. The MWAT is defined as “an implementation statistic that is calculated from field monitoring data.” The MWAT is calculated as the maximum weekly average temperature (WAT). The WAT is a simple moving average (rolling average) that uses a minimum of three equally spaced measurements throughout a 24 hour day over a seven-day consecutive period. MWAT are not to be overlapped, i.e. temperature

data used in the calculation of one exceedance of an MWAT will not be used in any other exceedance calculation.

- ii. Acute: Attainment of the acute numerical temperature standard is based upon a Daily Maximum (DM) water temperature, unless otherwise specified in a site-specific standard. The DM is defined as the highest 2-hour average water temperature recorded during a given 24-hour period.

b. Lakes and Reservoirs:

For lakes and reservoirs the WAT is assumed to be equivalent to the average temperature of the upper portion. As an initial screen, the upper portion is assessed using the average temperature of the top 0.5 – 2 meters as defined above for shallow lakes. When, upon this initial screen, the average temperature in the upper portion exceeds the chronic temperature standard, the Division will analyze the available data for adequate refugia.

6. Assessment of "All Tributary" segments

Generally, water quality data from multiple data sources and sampling sites is aggregated by segment for assessment of the segment as a whole. If there is some reason to believe that the impairment may not be representative of the entire segment, the Division will investigate further to determine whether the impairment is widespread or limited to individual portions of the segment such as specific tributaries or reaches. Typically, if all of the data from multiple tributaries within a segment indicate non-attainment, the Division will recommend that the entire segment be listed. Alternately, if data from one or more tributaries indicates attainment, the Division will propose listing of only those tributaries for which data indicates non-attainment. Based upon this assessment, either an entire segment or only a portion thereof may be proposed for listing.

D. Determination of Impairment

Application of chemical, physical and biological information in listing determinations requires consideration of the scientific rigor of the methodologies utilized to develop any such information, and the strength of that information. Rigor refers to the demonstrated validity of sampling, analytical, and assessment protocols and the availability of meta-data in support of those protocols. Strength refers to the quantity of data and the extent to which such data demonstrates clear and convincing evidence of attainment or non-attainment of standards.

Availability of physical or biological data indicating use impairment may also be used to support listing when chemical data is otherwise insufficient in and of itself. Greater weight is given to data that provides direct, quantifiable

documentation of impairment as opposed to data developed using surrogate indicators or parameters.

1. Impairment Where the Cause is Unknown

The federal Clean Water Act defines *pollution* as “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water,” CWA §502(19). Pollution may result from the introduction of pollutants or from causative factors other than pollutants. *Pollutants* are defined in the federal Clean Water Act at §502(6) to include “dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under Atomic Energy Act of 1954, as amended), heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.” Notwithstanding the federal definition cited above, certain radiological constituents are also regulated under the State’s Water Quality Control Act and are considered to be pollutants.

TMDL development is required in those instances where one or more pollutants are the cause of non-attainment. TMDLs are not required where the impairment is the result of pollution that is not a pollutant.

Water bodies with classified uses that are impaired but it is unclear whether the cause of impairment is attributable to pollutants as opposed to pollution will be provisionally listed on the Section 303(d) List. The List will include a notation identifying water bodies that are “provisionally listed.”

For water bodies that are provisionally listed on the Section 303(d) List, the Division, in cooperation with other interested persons, will undertake water quality monitoring and/or other water quality studies and assessments to determine whether the cause of the impairment is a pollutant. There will be a general goal of making this determination within ten years of provisionally listing any water body. No TMDL will be developed for a provisionally listed water body unless and until it is determined that the cause of the impairment is one or more pollutants.

a. Provisional Listing Process

Once a segment is provisionally listed, the process to determine a cause will include the following steps:

1. Determine if the impairment is caused by a “pollutant.”

Once a segment is provisionally listed on the 303(d) List, the cause of impairment must be identified through additional data collection and investigation.

If the impairment is caused by an identified pollutant, the segment will be placed on the 303(d) List as impaired for that pollutant (e.g., Cd, Fe(dis)) as well as for the applicable classified use without the “provisional” label. The Division will proceed with development of a TMDL.

2. Determine if the impairment is caused by “pollution.”

If the evaluation demonstrates that the segment impairment is due to pollution, then the segment will be removed from the 303(d) List (as “provisionally listed”) and would be placed in the Integrated Report Category 4c (impairment is not caused by a pollutant) at the time of the next Section 303(d) List review cycle.

3. The cause of the segment impairment remains unknown.

If it cannot be determined that the cause is one or more pollutant or is not caused by pollution the segment will remain on the 303(d) List as “provisionally” impaired (e.g., Aquatic Life Use, Provisional). The cause of the impairment is to be determined within the next ten years.

The fact that a water body is provisionally listed will not result in a prohibition of new or expanded discharges into the segment prior to the determination whether the impairment is caused by a pollutant.

To the extent it is known that a “pollutant” is the cause of the impairment, but the identity of the specific pollutant is not yet known, the water body segment will be listed. However, the fact that the water body is so listed will not result in a prohibition of new or expanded discharges into the segment until the pollutant is identified.

2. Impairment Where the Cause is Pollution (Category 4c)

In cases where the impairment is determined to be caused by pollution, instead of a pollutant(s), the impaired waterbody shall be placed into Category 4c. A TMDL would not be required for Category 4c waterbodies.

In some cases, the pollution is caused by the presence of a pollutant and a 303(d) listing (Category 5) is appropriate. In other cases, the pollution does not result from a pollutant, and a Category 4c is appropriate ~~within~~ for the impaired waterbody. Examples of circumstances where an impaired waterbody segment may be placed into Category 4c include segments impaired solely due to lack of adequate flow or to stream channelization.

Before placing impaired waterbody segments into Category 4c, thorough monitoring and assessment needs to be performed for the segment to

confirm that no pollutants are contributing to the failure to meet water quality standards. If adequate monitoring and assessment is not performed to rule out pollutant(s) as a cause, then the impaired waterbody should be placed on the 303(d) List (Category 5).

3. Impairment Where the Source of the Pollutant is Natural

In cases where adequate monitoring and assessment indicate that natural conditions are the key factor of criteria exceedance(s), 303(d) listings will still be determined for impaired waterbody segments, as appropriate, without consideration of natural vs. anthropogenic causes. If natural conditions are triggering the exceedance(s), the decision is made by the Commission through regulatory changes to the basin regulations in the triennial review process. Changes could involve the development of site-specific standards or use removal through an Use Attainability Analysis (UAA).

4. Impairment of Numeric Standards - Streams

Attainment of numeric chemical standards is assessed by comparison of ambient water quality against assigned standards. Assessment of chemical data considers attainment of both chronic and acute aquatic life use-based chemical standards, where both chronic and acute standards have been assigned to a given waterbody.

a. Chronic Standards

Values that fall outside of the percentile ranges described in Section III.C.1.a. Chemical Data - General, indicate non-attainment of chronic standards. If the paired hardness/concentration assessment is done, data indicates non-attainment of the chronic standard if the standard is exceeded more frequently than fifteen percent of the time. In the case where both methods are done and the listing decision differs between the two methods the paired hardness/concentration assessment decision is considered more representative.

b. Acute Standards

Acute standards are assessed by comparison of individual sample values against the standard. In general, data indicates non-attainment of an acute standard if the standard is exceeded more frequently than once in three years.

c. Agriculture and Domestic Water Supply Use-based Standards

These standards are expressed in terms of either 1-day or 30-day averaging periods (comparable to acute and chronic-based standards, respectively) and are assessed by comparison of the percentile ranges (described in Section III.C.1.a. Chemical Data – General) against the standard. Because total species data is often not available for many metals, an assessment

comparing the 50th percentile value of the dissolved metals fraction against the standard may be used to determine attainment for standards expressed as 30-day averages. Attainment of standards expressed as 1-day averages may be assessed by comparison of the dissolved metals fraction against the standard.

d. Water Supply Use-based Standards

Nitrate/Nitrite and Arsenic: Assessment of nitrate and/or nitrite, and arsenic Water Supply Use-based standards will consider the combined total or individual ambient concentrations for nitrate and/or nitrite, and the individual ambient concentrations for arsenic at the point of intake to a domestic water supply. Data located within five (5) stream miles upstream of a surface water intake on a classified water supply segment will be considered representative of the point of intake except as otherwise provided below. A good representation of these five mile reaches can be found in the surface water supply areas, as defined by New Rules and Amendments to Current Rules of the Colorado Oil and Gas Conservation Commission, 2 CCR 404-1. And, in order for decisions to be based on representative data, reservoirs with multi-level intake structures will be dealt with on a site specific basis.

Maps of surface water supply areas by the COGCC can be found at the COGCC website, under Rule 317B, currently located at:

http://cogcc.state.co.us/Downloads/Rule317B_Shapefiles.zip

Where an exceedance occurs within that five mile area, the water body shall not be placed on the 303(d) List if the standards are demonstrated to be met at the point of intake. Exceedances of nitrite and/or nitrate, and arsenic standards outside of the five mile reach, may lead to inclusion of the segment on the M&E List until additional data can be collected at the point of intake.

Where a range is specified for the arsenic standard, water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

Manganese, iron and sulfate: Standards for dissolved iron, dissolved manganese, and sulfate standards are assessed using the least restrictive of table value criteria or the existing quality of January 1, 2000 on a segment with the adopted Fe, Mn or SO₄= "WS(dis)." The table value criteria for manganese is 50 µg/L, for dissolved iron is 300 µg/L and for sulfate is 250 µg/L. To assess this standard, a library of water quality data representative of 2000 has been created for these parameters, and will be expanded as more data becomes available. The library consists of WQCD, United States Geologic Survey (USGS) and Riverwatch (RW) data for the time period of 1-

1-1995 to 1-1-2000. To determine the applicable standard to use in the assessment:

1. The sampling point data is plotted against the current stream segmentation file.

2. If all data in the library within a given sub-basin indicate values representative of conditions on January 1, 2000 is below the table value criteria from Regulation No. 31, then the entire sub-basin will be assessed against the table value criteria.

3. If any data within a given sub-basin are above the table value criteria, then all 2000 data located on the segment of interest will be aggregated and the 85th percentile will be taken to get a value from which to evaluate the water body. If the existing water quality as of January 1, 2000 is less than the applicable table value criteria then the table value criteria will be used as the standard. If the existing water quality as of January 1, 2000 is greater than the applicable table value criteria then the water quality as of January 1, 2000 will be used as the standard.

4. And finally, if there is no 2000 data available for the segment of interest then the 5 year period of record closest to 1/1/2000 will be considered representative of the 2000 data, if available information indicates that there have been no new or increased sources of these pollutants impacting the segment(s) in question during that period of record.

For example:

WBID	1995-2000	2001	2002	2003	2004	2005	2006	2007	2008
COLCLC42	No Data	n=0	n=0	n=2	n=4	n=0	n=4	n=0	n=0

In this case, the 85th percentile of the data from 2003-2006 would be used and considered representative of the 2000 data if no major changes occurred in this watershed from 2000 to 2006.

e. Temperature Standards

In 2007, basin-wide interim numeric temperature standards were established for each basin regulation. Segment specific numeric standards were adopted in the Upper and Lower Colorado River Basins (Regulation Nos. 33 & 37) in 2008 and in the South Platte River Basin (Regulation No. 38) in 2009. All other basins will still maintain the interim standards at the time of the December 2011 303(d) Rulemaking Hearing. Until the adoption of segment-specific numeric temperature standards and the expiration of the interim basin-wide standards, these basin-wide standards shall be implemented as chronic standards (MWATs).

- i. Chronic Temperature Standard (MWAT): In general, data indicates non-attainment of a chronic temperature standard if the standard is exceeded by a weekly average temperature (as defined in Section C.5.a.i) more frequently than once in three years.
- ii. Acute Temperature Standard (DM): In general, data indicates non-attainment of an acute temperature standard if the standard is exceeded by a daily maximum (as defined in Section C.5.a.ii) more frequently than once in three years.
- iii. Excursions from temperature standard: In Regulation No. 31, Footnote 5c, Table 1 includes 4 excursions when exceedances of the temperature standard are acceptable. The following outlines the data necessary to show that these excursions are acceptable:
 - Air Temperature Excursion: Ambient water temperature may exceed the temperature criteria or the applicable site-specific standard when the daily maximum air temperature exceeds the 90th percentile value of the daily maximum air temperatures in a given month calculated using at least 10 years of air temperature data.
 - Low flow excursion: Ambient water temperature may exceed the temperature criteria or the applicable site-specific standard when the daily stream flow falls below the acute critical low flow or monthly average stream flow falls below the chronic critical low flow, calculated pursuant to Regulation 31.9(1).
 - Lakes and Reservoirs excursion: Ambient water temperature may exceed the temperature criteria or the applicable site-specific standard in the upper portion if there is adequate refuge. This excursion is discussed below in Section III.D.5.a.
 - Winter shoulder-season excursion: For the purposes of assessment, ambient water temperatures in cold streams may exceed the winter criteria in Table 1 or applicable site-specific winter standard for 30-days before the winter/summer transition, and 30-days after the summer/winter transition, provided that the natural seasonal progression of temperature is maintained and that temperature exceedances during these periods are not the result of anthropogenic activities in the watershed.

5. Impairment of Numeric Standards - Lakes and Reservoirs

a. Temperature

For lakes and reservoirs, the MWAT is assumed to be equivalent to the maximum WAT. When a lake or reservoir is stratified, the upper portion may exceed the applicable standards in the basin regulations, provided that an adequate refuge exists in water below the upper portion. Adequate refuge depends on concurrent attainment within a given profile of the temperature standard and applicable dissolved oxygen standards. Attainment of the temperature standard below the upper portion is based on comparison with individual depths because of the need to verify concurrent attainment with the DO standard. If the refuge is not adequate because of low dissolved oxygen levels, the lake or reservoir will be listed as impaired for dissolved oxygen rather than for temperature.

b. Dissolved Oxygen

If the average dissolved oxygen concentration in the upper portion of a lake falls below the standard in any profile, the lake will be listed. Dissolved oxygen may be examined below the upper portion of the lake if adequate refuge is needed when assessing the temperature standard, as defined above, or where site-specific standards apply.

c. pH

Assessment of pH data follows the general approach outlined above for stream samples, except that upper and lower portions should be assessed separately. The 15th and 85th percentiles of the sample averages for the upper and lower portions (as defined above) are compared to the minima and maximum pH standard. Failure to attain the standard in either layer results in 303(d) Listing.

d. Metals and Inorganics

For these constituents, the assessment in lakes follows the same guidelines applied to stream samples except that samples from the upper and lower portions should be considered separately. Failure to attain the standard in either layer results in 303(d) Listing.

e. Site-specific Standards

Some lakes and reservoirs have been assigned site-specific standards for nutrients (total phosphorus) and chlorophyll a. These site-specific standards are identified in control regulations which are specific to a given waterbody. These presently include Dillon Reservoir, Cherry Creek Reservoir, Chatfield Reservoir, and Bear Creek Reservoir, which are evaluated on an annual basis for compliance with site-specific standards. The period for application of site-specific standards usually is defined as the growing season, and is described in the statement of basis and purpose for that standard. For example, growing season data are used to determine compliance with

standards for phosphorus. Any determination of site-specific standards attainment must be based upon application of such standards in a manner consistent with the applicable control regulation.

f. Multiple Profiles

If multiple profiles are collected from various locations for a lake on the same day, each profile will be evaluated separately. Multiple profiles will not be averaged for assessment purposes. If the Division determines impairment is isolated to an appropriate sub-segment or portion of a lake, the Division may place the portion on the 303(d) List.

6. Impairment of Numeric Standards - General

a. Representative Data

Factors to consider when determining whether or not data is representative include: spatial distribution of sampling locations within the water body/segment, temporal variability of the data, changes in the watershed (i.e. changes in predominant land use, presence of new discharges, source removal or remediation projects), age of the data, method detection limits, bias inherent in sampling design, etc.

For lakes and reservoirs, if a single profile indicates impairment among but numerous attaining profiles exist in the dataset and other indications of impairment are absent, the Division may place the lake on the Monitoring and Evaluation List so that additional data can be collected. If less than three profiles are available for assessment, the Division will use best professional judgment to determine if the data is representative. If the quality of the data is in question, the lake or reservoir will be placed on the M&E list so that additional data can be collected.

b. Portions of segments

If evaluation of a data set for an entire segment does not indicate impairment, but specific location(s) within the segment consistently exceed acute or chronic standards, the specific portion of the segment may be listed. This may also apply to lakes and reservoirs where sufficient data indicates impaired conditions are isolated to a specific portion of the lake.

c. Evaluation of *E. coli* Standards

In 2010, the Commission adopted a two-month averaging period for the existing *E. coli* criteria. Evaluation of the *E. coli* standard is over multiple fixed two-month intervals. The evaluation intervals are: January/February, March/April, May/June, July/August, September/October, and November/December. A sample size of 5 or more is required for assessment of the two-month intervals. Data will be assessed yearly if adequate data from each two-month interval are available. If adequate data

are not available to make an attainment decision using yearly data, then the Division will assess *E. coli* data for that two month interval over the entire period of record.

If adequate data from two-month intervals are not available to make an attainment decision, then assessment of the data will be on a seasonal basis. Because recreation typically occurs in the summer, the season of May through October will be used unless there is evidence that a different season is more appropriate.

Data sets comprised of four or fewer samples that indicate impairment of the *E. coli* standard will result in placement on the M&E List. *E. coli* data sets comprised of five to ten samples where there is overwhelming evidence of non-attainment or data sets of more than ten samples indicating any degree of non-attainment, will result in inclusion on the 303(d) List unless it is determined that the data is not representative (see section III.D.4.f Overwhelming Evidence).

d. Temporary Modifications

When temporary modifications of numeric standards have been adopted, attainment is assessed against the underlying standard, including those instances where the decision to assign a temporary modification is based specifically upon significant uncertainty as to the appropriate underlying standard (see section 31.7(3)(a)(iii) of the Basic Standards).

e. Sample size

Data sets comprised of three or fewer samples that indicate impairment of the chronic standard will result in placement on the M&E List except as noted for lakes and reservoirs below. Data sets comprised of four to ten samples where there is overwhelming evidence of non-attainment or data is supported by biological or physical evidence indicating non-attainment, or data sets of more than ten samples indicating any degree of non-attainment, will result in inclusion on the 303(d) List unless it is determined that the data is not representative (see paragraph below) except as noted for lakes and reservoirs.

For lakes and reservoirs, a minimum of 5 samples from the same location but from different dates are required for the assessment of the metals and inorganic standards. If less than 5 samples indicate impairment, the lake is placed on the M&E list so that additional data can be collected. If the sample size is 3 or 4 and there is overwhelming evidence of impairment (see below), the waterbody will be placed on the 303(d) List. For the assessment of lake temperature and dissolved oxygen data, only a single profile is required for assessment.

f. Overwhelming Evidence

Overwhelming evidence consists of sufficient and credible data that clearly demonstrate that a water body's designated beneficial uses are impaired. Overwhelming evidence is demonstrated when representative data (data that accounts for temporal and spatial variation) indicates an exceedance of numeric water quality standards by more than 50 percent in magnitude.

7. Impairment of Narrative Standards and Classified Uses

Impairment of narrative standards and classified uses may be supported by chemical data and/or information generated by biological and/or physical assessments. In instances where a determination of impairment is based solely upon biological and/or physical assessments, such assessments must provide clear and convincing evidence of non-attainment.

a. Aquatic Life Use

For aquatic life uses, the Division will generally consider impairment of narrative standards or classified uses to be demonstrated when either the physical/habitat data or biological community metrics reflect a condition that is significantly less than the expected or reference condition. The Division will also consider an impairment of the aquatic life use if a showing has been made consistent with the protocols established in WQCC Policy 10-1, *"Aquatic Life Use Attainment, Methodology to Determine Use Attainment for Rivers and Streams."* WQCC Policy 10-1 is available either in hard copy or electronically on the Colorado Water Quality Control Commission web site.

Benthic data submitted to the Division to be used in 303(d) Listing decisions using WQCC Policy 10-1 is to be submitted by the data cutoff date and in the preferred data format as requested by the Division. Upon receipt of all data, the Division will update the Benthics Master Taxa table and will send it to the organization for concurrence on taxa. The Division will then conduct a single sub-sampling of each sample. Once the subsampling is completed by the Division that version of EDAS (Ecological Data Application System) can be sent to all parties. MMI (Multimetric index) scores and metrics will be generated using this version of EDAS.

The Division will consider all reliable and representative aquatic life data including information regarding other assemblages (e.g., fish or algae) in determining whether or not a stream is impaired. In these cases, the criteria specified in Section III.C.3, above, will be used.

Upon determination of impairment the water body will be included on the 303(d) List unless the segment is currently included in Integrated Reporting Category 4a, 4b or 4c for an aquatic life use standards impairment. If the

segment is previously listed, or proposed to be listed for a pollutant causing an impairment of the aquatic life use, the segment will be listed for that pollutant as well as for impairment of the aquatic life use.

If there is no apparent pollutant, the impairment will be identified as “provisionally listed.”

“Consistent with Listing Methodology protocols, more data is not necessary to remove a segment than the amount of data used to list the segment. If one MMI score was used to list a segment, then a single, more recent, reliable and representative MMI score is sufficient to remove the segment from the 303(d) list for attainment.”

b. Water Supply Use

For water supply uses, the Division will consider chemical data, biological and/or physical assessments that provide clear and convincing evidence of non-attainment. Such impairment may be demonstrated by chemical data documented at levels toxic to humans. The Division will utilize Commission Policy 96-2, Human Health-Based Water Quality Criteria and Standards, in any determination of impairment based upon such information. Impairment decisions may also be supported by biological and physical data presenting overwhelming evidence of impairment due to color, taste and odor.

c. Narrative “Free-from Toxics” Standard

In-situ bioassay, or other ambient toxicity test results which demonstrate statistically significant lethal or sub-lethal adverse effects and which are supported by biological information demonstrating adverse impacts to aquatic community health, composition, or productivity, in comparison to an appropriate reference condition, will result in a decision of impairment. In general, interpretation of toxicity test results will conform to applicable portions of the *“IMPLEMENTATION OF THE NARRATIVE STANDARD FOR TOXICITY IN DISCHARGE PERMITS USING WHOLE EFFLUENT TOXICITY (WET) TESTING.”*

For lakes and reservoirs, impairment may be demonstrated where acute conditions (typically low DO levels) result in significant fish kills. Fish kills associated with accidental spills or isolated unauthorized discharges of toxics will not typically be considered a basis for listing.

d. Narrative Sediment Standards

A determination that the statewide narrative sediment standard is not attained relies upon a showing both that the aquatic life use is not supported and that sediment is deposited on the stream bottom. A specific method has been developed for use in demonstrating attainment or non-attainment of assigned aquatic life uses due to sediment deposition. The document titled ***Implementation Guidance for Determining Sediment Deposition***

Impacts to Aquatic Life in Streams and Rivers; WQCC Policy 98-1 is available either in hard copy or electronically on the Colorado Water Quality Control Commission web site.

8. Listing Based on Elevated Mercury in Fish Tissue

Waterbodies are assessed for attainment of Colorado's Aquatic Life Use (EPA's "fishable" goals of CWA Section 101(a)(2)) by comparing the median fish tissue mercury for each species/size class to a 0.3 ppm threshold level. For small datasets with a large portion of the data below the detection limit, the Division will substitute half the detection limit when calculating the median. More sophisticated statistical methods will be used to estimate the median instead of substitution when at least 5 values above the detection limit are available. Those waterbodies with a median fish mercury concentration for each species/size class that exceeds the 0.3 ppm threshold level will be placed on the 303(d) List. A minimum of 30 fish tissue samples from each species/size class are necessary to determine impairment of a waterbody for mercury in the fish tissue. For waterbodies where the data is short of this requirement, the waterbody will be placed on the Monitoring and Evaluation List so that additional data can be collected for assessment. If the sample size is between 10 and 30 and the median fish tissue mercury concentration is greater than 1.5 times the threshold level, the waterbody will be placed on the 303(d) List based on the overwhelming evidence of impairment.

Those waters that are listed due to elevated levels of mercury in fish tissue may be identified as low priority (notwithstanding the provisions of section IV.B.1 below) when the provisions applicable to EPA reporting category 5m are satisfied (see ***Information Concerning 2008 Clean Water Act Sections 303(d), 305(b) and 314 Integrated Reporting and Listing Decisions***, EPA, October 12, 2006). Waters are placed in reporting category 5m in instances where impairment is due to atmospheric deposition and where the state has in place a comprehensive mercury control program. The Division will evaluate each listing arising from mercury levels in fish tissue for evidence of current and historic mining activities within the contributing watershed, for other potential industrial sources and for potential geologic influences.

IV. PRIORITIZATION FOR TMDL DEVELOPMENT

The Division must ensure that TMDLs are developed for all water bodies and pollutants on the Section 303(d) List. Recognizing that all TMDLs cannot be completed at once and that certain risks may be greater than others, the Clean Water Act section directs the Division to prioritize the waters on the Section 303(d) List. The Division will use the prioritized

Section 303(d) List to focus resources to support the development of TMDLs. Provisionally listed segments will not be prioritized for TMDL development.

A. Prioritization Objective

The objective of the prioritization is to identify where the Division and the public should focus their resources. The identification of a high priority segment does not necessarily mean that the TMDL will be developed before any lower priority segments. For some high priority TMDLs, the development may have to await data collection or stakeholder outreach.

B. Assigning Priorities

Priorities are initially based on consideration of the severity of impairment to the use classifications for the segment. Use Classifications are described in *Basic Standards and Methodologies for Surface Water* Regulation No. 31 (5 CCR 1002-8, sec. 31.13). Secondary factors can be used to modify the initial prioritization to an overall or final prioritization. Secondary factors may either elevate a water body into a higher priority group (e.g., endangered or declining native species, public interest, administrative needs) or reduce the priority ranking (e.g., pace of stakeholder group development, CERCLA cleanup action in progress).

1. Severity of Water Quality Impairment

High Priority: Non-supporting for water supply standards based on Safe Drinking Water Act primary drinking water standards, Aquatic Life class 1 cold or warm, or Recreation Use class E. Listings based on high levels of mercury in fish tissue.

Medium Priority: Non-supporting for Aquatic Life class 2 cold or warm, or Agriculture.

Low Priority: Non-supporting for other water supply standards or Recreation Use class P, U or N, or non-supporting for underlying standard where a temporary modification based specifically upon significant uncertainty as to the appropriate underlying standard has been adopted and the Commission has determined that there is an appropriate plan in place to resolve the uncertainty.

2. Secondary Considerations

- Division action can support a local, regional or federal stakeholder group that is ready to move on to the next step of TMDL development, or there is substantial public interest and support.
- The water body is vulnerable or fragile as an aquatic habitat, or there are aquatic species of special concern present.

- The water body is of particular importance for recreational, economic and aesthetic uses.
- The Division can realize efficiency savings (e.g., synchronizing permits, linking segments within a watershed, availability of water quality data).
- There are immediate programmatic needs such as waste load allocations for permits that are due to expire or for new or expanding discharges, or to facilitate 319 project development in priority watersheds.
- There is a court ordered cleanup or CERCLA action in progress, which will change the contribution of pollutants (this consideration could reduce priority ranking).

3. Targeted TMDLs

It is the Division's intent that TMDLs that are designated as "Targeted TMDLs" will be completed prior to the next listing cycle, or within two years of promulgation of the 303(d) List by the Commission. Targeted TMDLs will most likely be those designated as "high priority" waters for TMDL development. However, not all "high priority" listings are suitable for TMDL development within a two-year window. For example, adequate data to support TMDL development is not available for all "high priority" listings. Conversely, waters designated as "medium" or "low priority" may be amenable to TMDL development within the next two years and may therefore be "targeted" for TMDL development at this point.

TMDL development is subject to a variety of factors that are both within and beyond the Division's control. These may include availability of adequate data, local or broader political concerns, new information that affects the listing decision, coordination with remedial programs such as CERCLA or Superfund, or availability of Division resources. Designation of a TMDL as "targeted" should be considered for planning purposes, but should not be treated as a definitive Division workplan commitment. The Division TMDL Program workplan is updated quarterly and is available on the Division website.

**ATTACHMENT 1
 Spawning Table**

Spawning	Egg Incubation	Intra-gravel Sac Fry	Fry Emerge
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OCT NOV DEC JAN FEB MAR APR MAY JUN

Successful spawning is defined as all four phases or conditions that allow eggs to be deposited, incubated, hatch and fry emergence.

Table* of approximate time and duration of spawning, and critical early development life stages for brown and rainbow trout in 11 physical habitat simulation study streams.

*From: "Determination of Population Limits For Critical Salmonid Habitats in Colorado Streams Using Physical Habitat Simulation System", B. Nerhing and R. Anderson. Rivers Journal, January 1993, Vol 4 No. 1, page 1-19, Table 3.

Gravel River	Species	Adult Spawning	Egg Incubation	Egg Hatching	Fry Emergence
Arkansas	brown	10/15 – 11/15	10/15 – 4/1	3/1 – 5/1	4/1 – 6/1
Blue	brown	10/15 – 11/15	10/15 – 6/1	4/1 – 6/1	5/15 – 7/1
Cache La Poudre	brown	10/15 – 11/15	10/15 – 6/1	4/1 – 6/1	5/15 – 7/1
Cache La Poudre	rainbow	4/15 – 5/30	4/15 – 7/15	6/15 – 7/15	7/1 – 8/1
Colorado	brown	10/15 – 11/15	10/15 – 4/1	4/1 – 6/1	5/15 – 6/15
Colorado	rainbow	4/15 – 4/30	4/15 – 6/15	6/1 – 7/1	6/15 – 7/15
Frying Pan	brown	10/15 – 11/15	10/15 – 5/1	4/1 – 6/1	5/15 – 6/15
Frying Pan	rainbow	4/1 – 5/1	4/1 – 6/15	6/1 – 7/1	6/15 – 7/15
Gunnison	brown	10/15 – 11/15	10/15 – 4/1	3/15 – 5/15	5/1 – 6/15
Gunnison	rainbow	4/1 – 5/1	4/1 – 6/15	6/1 – 7/1	6/15 – 7/15
Rio Grande	brown	10/15 – 11/15	10/15 – 5/1	4/1 – 6/1	5/15 – 6/15
S Fk Rio Grande	brown	10/15 – 11/15	10/15 – 6/1	5/1 – 7/1	6/1 – 7/15
S Platte	brown	10/15 – 11/15	10/15 – 5/1	4/1 – 6/1	5/1 – 6/15
S Platte	rainbow	4/1 – 5/15	4/1 – 6/1	6/1 – 7/1	6/15 – 7/15
St Vrain	brown	10/15 – 11/15	10/15 – 5/1	4/1 – 6/1	5/15 – 7/1
Taylor	brown	10/15 – 11/15	10/15 – 5/1	4/1 – 6/1	5/15 – 7/1

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