COLORADO
Water Quality
Control Commission
Department of Public Health & Environment

**COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT**

**Water Quality Control Commission**

**REGULATION NO. 31 - THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER**

**5 CCR 1002-31**

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**COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT**

**Water Quality Control Commission**

**REGULATION NO. 31 - THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER**

**5 CCR 1002-31**

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## 31.1 AUTHORITY AND SCOPE

This regulation is promulgated pursuant to 25-8-101 et seq., and in particular, 25-8-203 and 25-8-204, C.R.S. It provides basic standards, an antidegradation rule and implementation process, and a system: for classifying state surface waters; for assigning water quality standards; for granting temporary modifications and for periodic review of the classifications and standards.

## 31.2 PURPOSE

This regulation establishing basic standards and an antidegradation rule and implementation process and establishing a system for classifying state surface waters, for assigning standards, and for granting temporary modifications (hereinafter referred to as “Regulation”) is the foundation for the classification of the state surface waters of Colorado, as prescribed by the Colorado Water Quality Control Act.

It is intended to implement the state Act by maintaining and improving the quality of the state surface waters. This regulation is based on the best available knowledge to insure the suitability of Colorado's waters for beneficial uses including public water supplies, domestic, agricultural, industrial and recreational uses, and the protection and propagation of terrestrial and aquatic life.

It is further intended to be consistent with the 1983 and 1985 goals and objectives of the federal Act. This regulation shall be constructed in a manner consistent with these purposes and shall be considered part of the implementation of the 1983 and 1985 goals and objectives.

## 31.3 INTRODUCTION

This regulation presents a classification system which establishes beneficial use categories together with basic standards (section 31.11), an antidegradation rule (section 31.8), and numeric tables which define the conditions generally necessary to maintain and attain such beneficial uses. In addition, it establishes procedures for classifying the waters of the state, for assigning water quality standards, and for continued review of the classifications and standards.

The classifications set forth in section 31.13 will be assigned by applying the system to specific state surface waters, in accordance with proper procedures, including public hearings. The basic standards and the antidegradation rule will apply to all state surface waters at the effective date of this regulation. Whenever a specific stream segment or body of water receives a classification for one or more of the uses, additional numeric standards may be assigned. When appropriate, achieving water quality standards through innovative solutions or management approaches may be implemented through control regulations, TMDLs, Waste Load Allocations, antidegradation reviews, and permits. All classified uses will be protected. This does not mean that any entity has the right to rely on the presence of specific pollutants in the stream even though those pollutants may be utilized by the entity.

In assigning classifications and standards, the Commission shall take into consideration the water quality classifications and standards of downstream waters and shall ensure that as implemented through its

policies, the water quality classifications and standards of downstream waters will be attained and maintained.

Water quality standards, temporary modifications of numeric standards, and classifications shall be reviewed at least once every three (3) years and revised where appropriate. No provisions of this regulation shall be interpreted so as to supercede, abrogate, or impair rights to divert water and apply water to beneficial uses.

**31.4 DELETED**

**31.5 DEFINITIONS**

See the Colorado Water Quality Control Act, section 25-8-101 et seq., C.R.S., and the codified water quality regulations additional definitions.

(1) "ACT" means the Colorado Water Quality Control Act, section 25-8-101 et seq., C.R.S..

(2) "ACUTE STANDARD" means the level not to be exceeded by the concentration for either a single sample or calculated as an average of all samples collected during a one-day period, except for temperature, which shall be based on the DM (see DM definition). As used in tables II and III, acute represents one-half of the LC-50 that protects 95 percent of the genera in a waterbody from lethal effects. The acute standard is implemented in combination with a selected duration and frequency of recurrence (section 31.9(1)). In determining attainment of the applicable acute standard, the representative nature of the data must be considered.

(3) "ANTIDEGRADATION RULE" means the rule established in section 31.8.

(4) "BASIC STANDARDS" means those standards as established in section 31.11.

(5) "BENEFICIAL USES" means those uses of state surface waters to be protected such as those identified in the classification system.

(6) "BMP" (Best Management Practices) means a practice or a combination of practices that is determined by a governmental agency after problem assessment, examination of alternative practices, and appropriate public participation, to be the most effective, practicable (including technological, economic; and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with quality goals.

(7) "CHRONIC STANDARD" means the level not to be exceeded by the concentration for either a single representative sample or calculated as an average of all samples collected during a thirty-day period, except for temperature, which shall be based on the WAT (see WAT definition). As used in tables II and III, chronic represents the level that protects 95 percent of the genera from chronic toxic effects. Chronic toxic effects include, but are not limited to, demonstrable abnormalities and adverse effects on survival, growth, or reproduction. The chronic standard is implemented in combination with a selected duration and frequency of recurrence (section 31.9(1)). In determining attainment of the applicable chronic standard, the representative nature of the data must be considered.

(8) "COLD WATER BIOTA" means aquatic life, including trout, normally found in waters where the summer weekly average temperature does not frequently exceed 20 ºC.

(9) "COMMISSION" means the Colorado Water Quality Control Commission.

(10) "COMPENSATORY WETLANDS" means wetlands developed for mitigation of adverse impacts to other wetlands (e.g. wetlands developed pursuant to section 404 of the federal Act).

(11) "CONSTRUCTED WETLANDS" means those wetlands intentionally designed, constructed and operated for the primary purpose of wastewater or stormwater treatment or environmental remediation provided under CERCLA, RCRA, or section 319 of the federal Act, if (a) such wetlands are constructed on non wetland sites that do not contain surface waters of the state, or (b) such wetlands are constructed on previously existing wetland sites, to the extent that approval or authorization under section 404 of the federal Act has been granted for such construction or it is demonstrated that such approval or authorization is not, or was not, required. This term includes, but is not limited to, constructed swales, ditches, culverts, infiltration devices, catch basins, and sedimentation basins that are part of a wastewater or stormwater treatment system or a system for environmental remediation mandated under CERCLA or RCRA. Compensatory wetlands shall not be considered constructed wetlands. Constructed wetlands are not state waters.

(12) "CREATED WETLANDS" means those wetlands other than compensatory wetlands created in areas which would not be wetlands in the absence of human modifications to the environment. Created wetlands include, but are not limited to wetlands created inadvertently by human activities such as mining, channelization of highway runoff, irrigation, and leakage from man-made water conveyance or storage facilities. Wetlands resulting from hydrologic modifications such as on-channel reservoirs or on-channel diversion structures that expand or extend the reach of adjacent classified state waters are not considered created wetlands.

(13) "DAILY MAXIMUM TEMPERATURE (DM)" means the highest two-hour average water temperature recorded during a given 24-hour period.

(14) "DISSOLVED METALS" means that portion of a water and suspended sediment sample which passed through a 0.40 or 0.45 um (Micron) membrane filter. Determinations of "Dissolved" constituents are made using the filtrate. This may include some very small (Colloidal) suspended particles which passed through the membrane filter as well as the amount of substance present in true chemical solution.

(15) "DIVISION" means the Division of Administration of the Colorado Department of Public Health and Environment of which the Water Quality Control Division is a part.

(16) "*E.coli*" means *Escherichia coli*.

(17) "EFFLUENT-DEPENDENT STREAM" means a stream that would be ephemeral without the presence of wastewater effluent, but has continuous or periodic flows for all or a portion of its reach as the result of the discharge of treated wastewater.

(18) "EFFLUENT-DOMINATED STREAM" means a stream that would be intermittent or perennial without the presence of wastewater effluent whose flow for the majority of the time is primarily attributable to the discharge of treated water (i.e. greater than 50 percent of the flow consists of treated wastewater for at least 183 days annually, for eight out of the last ten years).

(19) "EPHEMERAL STREAM" means a stream channel or reach of a stream channel that carries flow during, and for a short duration as the result of, precipitation events or snowmelt. The channel bottom is always above the groundwater table.

(20) "EXISTING QUALITY" means the numeric value that represents the quality of a water body and is generally used for comparison with the water quality standard. Existing quality shall be calculated as:

- Total ammonia, nitrate, and the dissolved metals: 85th percentile
- Total recoverable metals: 50th percentile

- Dissolved oxygen: 15th percentile
- *E. coli:* geometric mean
- pH: the range between the 15th and 85th percentiles
- Temperature: for the purposes of implementing the acute and chronic standard, "existing quality" is the seasonal maximum DM and WAT and which allows one warming event with a 3-year average exceedance frequency. For data records less than or equal to 3 years, existing quality is equal to the maximum WAT and DM. For data records with 4-6 years, one warming event above the standard is permitted.

(21) "FEDERAL ACT" means the Clean Water Act, U.S.C. Section 1251 et seq., as amended.

(22) "FIRST (1st) ORDER STREAM" means a stream that has no tributaries, based on USGS mapping at 1:100,000 scale.

(23) "FLOODPLAIN" means any flat or nearly flat lowland that borders a stream, a lake, or an on-channel reservoir and that may be covered by its waters at flood or high stage as described by the parameter of the probable maximum flood or probable maximum high stage.

(24) "HIGHEST ATTAINABLE USE" means the modified use that is both closest to the uses specified in section 31.13 and attainable based on the evaluation of the factors in 31.6(2)(b) that preclude attainment of the use and any other information or analyses that were used to evaluate attainability.

(25) "LC-50" means the concentration of a parameter that is lethal to 50% of the test organisms within a defined time period.

(26) "MAXIMUM WEEKLY AVERAGE TEMPERATURE (MWAT)" means the largest WAT in the period of interest. For lakes and reservoirs, the summertime MWAT is assumed to be equivalent to the maximum WAT from at least three profiles distributed throughout the growing season (generally July-September).

(27) "MIXED LAYER" means that part of a lake that is well-mixed by wind action and can be expected to have relatively homogeneous physical and chemical conditions. In a thermally stratified lake, the mixed layer corresponds to the *epilimnion*; in an unstratified lake, the mixed layer extends to the bottom. The vertical extent of the mixed layer usually is determined by inspection of a vertical profile of temperature.

(28) "MIXING ZONE" means that area of a water body designated on a case-by-case basis by the Division which is contiguous to a point source and in which certain standards may not apply.

(29) "NUMERIC VALUE" means the measured concentration of a parameter.

(30) "PARAMETER" means the chemical constituents or other characteristics of the water such as algae, *E. coli*, total dissolved solids, dissolved oxygen, or the magnitude of radioactivity levels, temperature, pH, and turbidity, or other relevant characteristics.

(31) "PERMIT" means a National Pollutant Discharge Elimination System (NPDES) permit, a Colorado Discharge Permit System (CDPS) permit, or other state water quality permit.

(32) "POTENTIALLY DISSOLVED METALS" means that portion of a constituent measured from the filtrate of a water and suspended sediment sample that was first treated with nitric acid to a pH of less than 2.0 and let stand for 8 to 96 hours prior to sample filtration using a 0.4 or 0.45 μm

membrane filter. Note the “Potentially Dissolved” method cannot be used where nitric acid will interfere with the analytical procedure used for the constituent measured.

(33) “PRIMARY CONTACT RECREATION” means recreational activities where the ingestion of small quantities of water is likely to occur. Such activities include but are not limited to swimming, rafting, kayaking, tubing, windsurfing, water-skiing, and frequent water play by children.

(34) “REGIONAL WASTEWATER MANAGEMENT PLAN” means a water quality planning document prepared pursuant to section 208 of the federal Act, sometimes referred to as “208 Plans” or “Water Quality Management Plans.”

(35) “REPRODUCTIVE SEASON” means the portion of the year when fish migration, spawning, egg incubation, fry rearing or other reproductive functions occur.

(36) “SALINITY” means total dissolved solids (TDS).

(37) “SECOND (2nd) ORDER STREAM” means a stream which begins downstream of the confluence of two first (1st) order streams and ends downstream of the confluence of two second (2nd) order streams, based on USGS mapping at 1:100,000 scale.

(38) “STANDARD” means a narrative and/or numeric restriction established by the Commission applied to state surface waters to protect one or more beneficial uses of such waters. Whenever only numeric or only narrative standards are intended, the wording shall specifically designate which is intended.

(39) “STATE WATERS” means any and all surface and subsurface waters which are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.

(40) “TABLES” means tables I, II, and III, appended to this regulation, which set forth accepted levels for various parameters which will generally protect the beneficial uses of state surface waters.

(41) “THIRD (3rd) ORDER STREAM” means a stream which begins at the confluence of two second (2nd) order streams and ends downstream of the confluence of two third (3rd) order streams, based on USGS mapping at 1:100,000 scale.

(42) “TOTAL RECOVERABLE METALS” means that portion of a water and suspended sediment sample measured by the total recoverable analytical procedure described in “Methods for Chemical Analysis of Water and Wastes,” U.S. Environmental Protection Agency, March, 1979, or its equivalent.

(43) “TRIBUTARY WETLANDS” means wetlands that are the head waters of surface waters or wetlands within the floodplain that are hydrologically connected to surface waters via either surface or ground water flows. The hydrologic connection may be intermittent or seasonal, but must be of sufficient extent and duration to normally reoccur annually. Tributary wetlands do not include constructed or created wetlands.

(44) “USE ATTAINABILITY ANALYSIS” means an assessment of the factors affecting the attainment of aquatic life uses or other beneficial uses, which may include physical, chemical, biological, and economic factors.

(45) “USES” see Beneficial Uses.

(46) “WARM WATER BIOTA” means aquatic life normally found in waters where the summer weekly average temperature frequently exceeds 20 ° C.

(47) “WATER QUALITY-BASED DESIGNATION” means a designation adopted by the Commission for specific state surface waters pursuant to section 31.8(2), to identify which level of water quality protection such waters will receive under the Antidegradation Rule in section 31.8(1). Such designations are adopted pursuant to the Commission's authority to classify state waters, as set forth in section 25-8-203, C.R.S., and the procedural requirements for classifying state waters shall be applied in adopting such designations.

(48) “WATER EFFECT RATIO” means a ratio that is computed as a specific pollutant's acute or chronic toxicity value measured in water from the site covered by a standard, divided by the respective acute or chronic toxicity value in laboratory dilution water, as more specifically defined in 40 C.F.R. subsection 131.36(c) (1993).

(49) “WATER QUALITY STANDARD” see Standard.

(50) “WEEKLY AVERAGE TEMPERATURE (WAT)” means the average of daily average temperatures over a seven-day consecutive period, with a minimum of three data points spaced equally through each day. For lakes and reservoirs, the WAT is assumed to be equivalent to the average temperature of the mixed layer. The average temperature of the mixed layer is determined from a vertical profile of equally-spaced temperature measurements, separated by not more than one meter.

(51) “WETLANDS” means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

## 31.6 PROCESS FOR ASSIGNING CLASSIFICATIONS

The Commission is responsible for classifying state waters as set forth in sections 25-8-202(1)(a), and 25-8-203, C.R.S. All state surface waters may be classified in one or more of the use classifications as set forth in section 31.13.

Waters shall be classified for the present beneficial uses of the water, or the beneficial uses that may be reasonably expected in the future for which the water is suitable in its present condition or the beneficial uses for which it is to become suitable as a goal. The assignment of one or more classifications to a portion of the state surface waters is based upon its current suitability for the designated uses or goals for future uses. Where the use classification is based upon a future use for which the waters are to become suitable, the numeric standards assigned to such waters to protect the use classification may require a temporary modification to the underlying numeric standard and an implementation plan for eliminating the temporary modification.

When assigning classifications to waters of a given area, the Commission will consider the goals, objectives, and requirements of federal and state statutes and regulations, recommendations of the regional wastewater management plans (208 plans); 208 plans of adjoining regions; testimony, comments, and documents presented at public hearings on the issue; and other relevant information.

### (1) Considerations in Assigning Classifications

The following will serve to guide the Commission in assigning classifications:

(a) Classifications should be directed towards the realization of the water quality goals as set forth in the federal and state Acts.

(b) It is state law and policy to prevent any water quality degradation that can interfere with present uses.

(c) Upstream classifications must not jeopardize downstream classifications or actual uses.

(d) Classification must protect all current classified and actual uses, unless it is determined after a public hearing that downgrading is justifiable. (See section 31.6(2)(b)).

(e) Classifications should be for the highest water quality attainable. Attainability is to be judged by whether or not the use classification can be attained in approximately twenty (20) years by any recognized control techniques that are environmentally, economically, and socially acceptable as determined by the Commission after public hearings. At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under the federal Act for point sources and cost-effective and reasonable best management practices for nonpoint source control, in accordance with duly adopted regulations.

(f) Relevant physical, chemical and biological characteristics are valid water quality concerns that may be taken into account in the classification process.

**(2) Upgrading and Downgrading**

(a) Upgrading

The state shall maintain those water use classifications which are currently being attained. Where existing classifications specify fewer designated water uses than those which are presently being attained, the Commission shall upgrade the designated classification to reflect the uses actually being attained.

(b) Downgrading

At a minimum, the state shall maintain those water use classifications currently designated, unless it can be demonstrated that the existing classification is not presently being attained and cannot be attained within a twenty (20) year time period. Nonattainability must be due to at least one or more of the following conditions:

(i) Naturally occurring pollutant concentrations prevent the attainment of the use within a twenty (20) year period; or

(ii) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met; or

(iii) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied within a twenty (20) year period or would cause more environmental damage to correct than to leave in place; or

(iv) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(vi) Controls more stringent than those required by section 301(b) and 306 of the federal Act would result in substantial and widespread economic and social impact; or

(vii) Agricultural practices which are considered satisfactory for the locality. It must be demonstrated that these agricultural practices preclude the present classifications. Satisfactory practices will be approved by the Commission based on evidence from areawide 208 agencies, soil conservation districts, agricultural extension services and other public input.

An additional reason for revising classifications will be where previous classifications had no basis in fact and did not reflect actual beneficial uses. Such corrections to classifications shall not be considered downgrading. See e.g., section 31.6(3)(b) regarding hearings pursuant to section 25-8-207, C.R.S.

**(3) Procedures for Assigning or Changing Classifications**

(a) General

(i) Assigning or changing a classification shall be accomplished by rule after a rulemaking hearing. Rulemaking hearings to consider a classification will be conducted according to the Procedural Regulations of the Commission. At a minimum, the Commission shall review classifications once every three years. Any interested person have shall have the right to petition the Commission to assign or change a stream classification. Such petition shall be open to the public inspection. Except as provided below, pursuant to section 24-4-103(7), C.R.S., action on such petition shall be within the discretion of the Commission. The Commission may also decide to consider a classification on its own motion.

(ii) In making a decision regarding a proposed classification, the Commission will consider the principles set forth in this regulation. The decision will be made by the Commission applying its expertise after analyzing the evidence presented at public hearing and considering the requirements of law, its own policies, and all other matters deemed pertinent in the discretion of the Commission.

(iii) Where the classifications of a water body segment do not include an aquatic life classification or recreation class E, P, or U, as a part of the triennial review of the segment the Division shall review any prior use attainability analyses or other basis for omission of one or more of the above classified uses. If the justification for the omission is determined not to be consistent with accepted use attainability procedures, the Division or other party, if any, advocating the omission shall perform a supplemental analysis to provide a basis for a Commission determination whether such uses are attainable. When the Commission wishes to remove an aquatic life class 1 or 2 or recreation class E, P, or U classification, the Division shall conduct or the Commission shall require the petitioner to conduct, in consultation with the Division, a use attainability analysis to justify the proposed change.

(b) Section 25-8-207

(i) Procedural requirements relating to reviews pursuant to section 25-8-207, C.R.S., are set forth in the Procedural Regulations, Regulation No. 21, 5 CCR 1002-21.

(ii) The Commission shall, upon petition, or upon its own motion, review existing stream standards, classifications or water quality designations in subsection (iii) below. The Commission may revise stream standards, classifications and designations pursuant to the criteria listed in subsection (iv) below.

(iii) The Commission shall make a finding of inconsistency, taking into account sections 25-8-102 and 25-8-104, C.R.S., if a water quality designation does not conform with the provisions of section 25-8-209 or if the existing use classification(s) or water quality standards:

(A) are more stringent than is necessary to protect fish life, shellfish life, and wildlife in water body segments which are reasonably capable of sustaining such fish life, shellfish life, and wildlife from the standpoint of physical, streambed, flow, habitat, climatic and other pertinent characteristics. Where such characteristics are adequate to support the use, use classifications shall be adopted or retained to protect aquatic life which constitutes a significant source of food supply for the fish, shellfish, or wildlife that is the basis for the classified use; or

(B) were adopted based upon material assumptions that were in error or no longer apply.

(iv) As a result of any hearing held pursuant to this section, the Commission may revise or change use classifications, water quality standard(s) or water quality designations in accordance with the criteria contained in the Act or whenever necessary to insure compliance with the other provisions of this regulation.

(v) Where the Commission determines that an inconsistency exists, it shall declare the inconsistent classification, standards or designations void ab initio and shall simultaneously establish appropriate classifications, standards or designations.

**(4) Segmentation**

(a) For purposes of adopting site-specific classifications and water quality standards, the streams and other surface water bodies shall be identified according to river basin and/or subbasin and specific water segments.

(b) Segments may constitute a specified stretch of a river mainstem, a specific tributary, a specific lake or reservoir, or a generally defined grouping of waters within the basin (e.g., a specific mainstem segment and all tributaries flowing into that mainstem segment).

(c) Segments shall generally be delineated according to the points at which the use, physical characteristics or water quality characteristics of a watercourse are determined to change significantly enough to require a change in use classifications and/or water quality standards. In many cases, such transition points can be specifically identified from available water quality data. In other cases, however, the delineation of segments shall be based upon best judgments of where instream changes in uses, physical characteristics or water quality occur, based upon upstream and downstream data.

(d) Segment descriptions, unless specified by the Commission, are to mean that any boundary reference other than those that begin at the “source” means to be “immediately above” that reference.

## 31.7 PROCESS FOR ASSIGNING STANDARDS AND GRANTING, EXTENDING, OR REMOVING TEMPORARY MODIFICATIONS AND VARIANCES

Overview: Assigning or changing a standard or granting, removing before its expiration, or extending a temporary modification or variance shall be accomplished by a rule after a rulemaking hearing. The procedures for taking such action shall be the same as the procedures for assigning or changing classifications. See section 31.6(3)(a)(i).

**(1) Assigning Standards**

The Commission is responsible for promulgating water quality standards as set forth in section 25-8-204, C.R.S. Standards may be narrative and/or numeric and include the following:

(a) Basic Standards

The basic standards in section 31.11 shall apply to all state surface waters at the effective date of the regulation.

(b) Numeric Standards

A numeric standard may be assigned by the Commission either to apply on a statewide basis or to specific state surface waters. A numeric standard will be assigned by the Commission when it is presented with evidence that a particular numeric level for a parameter is the suitable limit for protecting the classified use. A numeric standard consists of a numeric level and may include a description as to how that numeric level is to be measured. Numeric standards will include appropriate averaging periods and appropriate frequencies of allowed excursions. A numeric standard may be exceeded due to temporary natural conditions such as unusual precipitation patterns, spring runoff or drought. Such uncontrollable conditions are not cause for changing the numeric standard.

A temporary modification of a numeric standard may be granted by the Commission if the numeric standard is not being met at the present time, but such numeric standard is necessary to allow the full attainment of the classified use.

Numeric standards will be assigned based on the evidence presented at the classification and numeric-standard-setting hearings. Numeric standards may not necessarily be assigned for all constituents listed in the tables. In making this determination, the Commission will consider the likelihood of such constituents being present in the waters in question naturally or due to point or nonpoint sources, and shall consider the significance of the constituents with respect to protection of the classified uses. Entities having specific water quality data for the waters being classified, such as 208 agencies, local municipalities and industries, and citizens' groups, the Water Quality Control Division, state and federal agencies, environmental organizations, and other interested persons are encouraged to present such information.

The Commission may use any of the following approaches to establish site-specific numeric standards, as it determines appropriate with respect to specific state surface waters. Existing site-specific standards shall remain in effect until superseded by revised standards promulgated pursuant to this section:

(i) Table Value Standards

The Commission may apply the numeric levels set forth in tables I, II, and III as site-specific standards when those levels are determined to be appropriate to protect the applicable classified uses, and the available site-specific information does not indicate that one of the following alternative approaches to numeric standards would be more appropriate. Acute and chronic standards may be adopted. Numeric standards may not necessarily be assigned for all constituents listed in the tables. Standards for metals may be established by site-specific adoption of the hardness-dependent equations in table III, instead of single-value numeric standards. The numeric levels for various parameters in tables I, II, and III, are levels determined by the Commission after careful analysis of all available information and are generally considered to protect the beneficial use classifications. They are intended to guide the Commission and others at the use classification and numeric-standard-setting hearings.

(ii) Ambient Quality-Based Standards

(A) Where ambient water quality levels are worse than specific numeric levels contained in tables I, II, and III, but are determined adequate to protect the highest attainable uses, the Commission may adopt one of the two following types of site-specific ambient quality-based standards:

(I) Feasibility-based Ambient Standard: Where water quality can be improved, but not to the level required by the current numeric standard, a feasibility-based numeric ambient standard may be adopted based on available representative data.

(II) Natural or Irreversible Ambient Standard: Where no improvement is feasible, or sources and causes are natural, a site-specific numeric standard may be adopted at existing quality based on available representative data. Site-specific acute standards for parameters in Table III shall be based on the 95th percentile value of the available representative data.

(B) Ambient quality-based standards are authorized only where a comprehensive analysis and review is conducted:

(I) Which identifies the sources and causes of the elevated levels and characterizes existing conditions, including spatial and temporal variation;

(II) Where sources and causes are not natural, a comprehensive alternatives analysis identifies the improved water quality conditions (if any) that could result from feasible pollution control alternatives;

(III) Which includes a rationale for either retaining or revising the current use classification(s); and

(IV) Which characterizes the highest attainable use.

(iii) Site-Specific-Criteria-Based Standards

For state surface waters where an indicator species procedure (water effects ratio), recalculation procedure, use attainability analysis or other site-specific analysis has been completed in accordance with section 31.16(2)(b), or in accordance with comparable procedures deemed acceptable by the Commission, the Commission may adopt site-specific standards as determined to be appropriate by the site-specific study results. For segments assigned aquatic life classifications, where factors other than water quality substantially limit the diversity and abundance of species present, the Commission may adopt site-specific acute or chronic standards as determined to be appropriate based upon available information regarding the waters and the habitat. Recurrence intervals for site-specific-criteria-based standards may be determined on a site-specific basis.

Site-specific-criteria-based standards and ambient quality-based standards for metals shall be based on dissolved metals whenever the Commission determines that the evidence presented is adequate to justify such standards. Site-specific standards for metals in effect prior to July 31, 1988 were generally based on total recoverable metals. Those standards shall remain in effect until superseded by revised standards promulgated pursuant to this section.

(iv) Standards For Surface Waters In Wetlands

(A) Tributary wetlands to which the interim classifications referenced in section 31.13(1)(e)(iv) apply, shall be subject to the following interim standard:

(1) Until such time as the Commission adopts site-specific standards for the tributary wetland, water quality in the wetland shall be maintained for each parameter at whichever of the following levels is less restrictive:

(a) ambient quality, or

(b) that quality which meets the numeric standards (except for numeric standards for pH, dissolved oxygen, and any standard established for the protection of a domestic water supply use) of the tributaries of the surface water segment to which the wetland is most directly hydrologically connected. Where the applicable numeric standard is based on section 31.16, table III, of this regulation, the numeric standard applicable to the wetland may be implemented taking into account the water effect ratio of the pollutant.

(2) Ambient quality shall be determined in accordance with section 31.7(1)(b)(ii) and shall take into account the location, sampling date, and quality of all available data. Ambient quality shall be determined as of the time the first regulatory action is undertaken which requires the identification of water quality standards for wetlands. If available information is not adequate to otherwise determine or estimate ambient quality, the interim standard set forth in section 31.7(1) (b) (iv) (A) (1) (b) shall apply.

(B) Wetlands for which the Commission has adopted a site-specific “wetlands” classification described in section 31.13(1)(e)(v), shall be subject to numeric standards and designations adopted by the Commission. The Commission shall adopt any numeric standards and designations determined to be appropriate in view of the functions and values to be protected for the wetlands in question.

(C) Created wetlands, shall be subject only to the narrative standards set forth in section 31.11, unless the Commission has adopted the wetlands classification and appropriate numeric standards. All created wetlands will have a use-protected designation unless determined otherwise as a result of a site-specific hearing.

(D) Compensatory wetlands shall be subject to the standards of the segment in which they are located, unless the Commission adopts a wetlands classification and appropriate numeric standards.

(E) All other wetlands which are state waters shall be subject only to the narrative standards set forth in section 31.11, unless the Commission has adopted the wetlands classification and appropriate numeric standards.

(F) The issuance and use of site-specific or individual permits under section 404 of the Clean Water Act, is not precluded by the provisions of sections 31.7, 31.11 or 31.13, except as provided in the 401 certification process under section 25-8-302, C.R.S.

(G) Wetlands water quality standards and classifications shall not be interpreted or applied in a manner that is inconsistent with sections 25-8-102(5) and 25-8-104, C.R.S.

(c) Site-Specific Narrative Standards

(i) Narrative standards may be assigned by the Commission to apply on a specific state surface water where numeric criteria are not required under federal law. Narrative standards will be assigned based on the evidence presented at the classification and numeric-standards-setting hearings, and must protect the classified uses.

(ii) The Commission may adopt a site-specific narrative standard where water quality currently is degraded as a result of historical mining activities and improvement is likely within 20 years, if it determines that such a standard is the most appropriate option to protect existing uses and to promote water quality improvement efforts for the segment(s) in question due to uncertainty regarding what water quality is attainable. Unless the Commission determines that a different approach is appropriate on a site-specific basis, it shall use a statement that the standard(s) for the pollutant(s) in question shall be the chemical concentrations, biological conditions, and/or physical conditions identified by a structured scientific use attainability analysis, or table value standards, if the use attainability analysis is not completed and submitted by a specified date and approved by the Commission. Generally, a numerical temporary modification based on existing ambient quality will also be adopted for the segment(s) and pollutant(s) in question.

**(2) Considerations in Assigning Standards**

In promulgating water quality standards, the Commission shall consider:

(a) The need for standards which regulate specified pollutants;

(b) Such information as may be available to the Commission as to the degree to which any particular type of pollutant is subject to treatment; the availability, practicality, and technical and economic feasibility of treatment techniques; the impact of treatment requirements upon water quantity; and the extent to which the discharge to be controlled is significant;

(c) The continuous, intermittent, or seasonal nature of the pollutant to be controlled;

(d) The existing extent of pollution or the maximum extent of pollution to be tolerated as a goal;

(e) Whether the pollutant arises from natural sources;

(f) Beneficial uses of water; and

(g) Such information as may be available to the Commission regarding the risk associated with the pollutants including its persistence, degradability, the usual or potential presence of the affected organism in any waters, the importance of the affected organisms, and the nature and extent of the effect of the pollutant on such organisms.

**(3) Granting, Extending, and Removing Temporary Modifications to Numeric Standards**

Where non-attainment of underlying standards has been demonstrated or predicted the Commission may grant a temporary modification to a numeric standard upon a showing that the conditions in subsection (a), below, exist. The presence of a modification will be indicated by adding the words “Temporary Modification” in the Temporary Modifications and Qualifiers column, and listing the parameter, the operative value and the expiration date. A temporary modification may be granted to an entire stream or

water body or to any portion thereof. It may be granted at the time a numeric standard is assigned or at any later time. When the temporary modification expires or is removed by the Commission, the underlying numeric standard will be in full effect. In every case, the modification to the numeric standard shall be temporary. All temporary modifications must be re examined not less than once every three (3) years.

In general, requests for a temporary modification are preferred over a more permanent downgrading of a present classification where it appears that the conditions causing the lower water quality might be temporary within a twenty (20) year time frame. The adoption of a temporary modification recognizes current conditions while providing an opportunity to resolve the uncertainty. Retaining a classification higher than the present usage will serve as a reminder that the conditions are correctable and may increase the priority for funding to attain the classified use.

(a) Conditions Justifying a Temporary Modification

The Commission may grant a temporary modification if:

(i) an existing permitted discharge has a demonstrated or predicted water quality-based effluent limit compliance problem, and

(ii) one of the following is shown to exist:

(A) there is significant uncertainty regarding the water quality standard necessary to protect current and/or future uses.

(B) there is significant uncertainty regarding the extent to which existing quality is the result of natural or irreversible human-induced conditions.

(b) Adequate Supporting Information

Adequate supporting information must be submitted including a justification for the interim narrative or numeric value, wherever possible raw data describing effluent and ambient quality, a plan for eliminating the need for the temporary modification, and a justification for the proposed expiration date.

(c) Eliminating the Need for A Temporary Modification

Regional wastewater management plans (208 plans) and plan updates, discharge permits, wasteload allocations, planning, design, and construction of new enlarged, or improved facilities, management practices, and other water quality controls and actions shall be geared toward fully attaining the classified use and underlying numeric standard and assist in eliminating the need for the temporary modification, in a manner consistent with the provisions of subsection 31.9.

(d) Operative Value During the Time of the Temporary Modification

In order to protect existing uses, the operative value during the time of the temporary modification will be set to represent the current condition of the waterbody by either:

(i) a numeric value representing the existing quality at the time of adoption, or

(ii) a narrative “current condition” that assures existing uses are protected and that the status quo is preserved during the term of the temporary modification.

(e) Duration of a Temporary Modification

When a temporary modification is granted, the duration of the temporary modification will be set by the Commission. The duration of a temporary modification shall be determined on a case-by case basis, based upon all relevant factors, including how soon resolving the issues that necessitated adoption of the temporary modification is deemed feasible. In making a decision as to whether a temporary modification should be removed or extended, the Commission will consider the existence of an implementation plan for eliminating the need for the temporary modification, the progress being made in trying to implement such a plan, the impact of the temporary modification on the uses of the stream in the area of the temporary modification and upstream and downstream of that area, and all other relevant factors.

(f) Frequency of Commission Review

The Commission will hold an annual public hearing to review temporary modifications which expire within approximately two years of the hearing date. As a result of the hearing, the Commission may:

(i) Delete the temporary modification and allow the existing underlying standards to go into effect;

(ii) Delete the temporary modification and adopt a revised underlying standard;

(iii) Extend the expiration date of the current temporary modification, with or without a revised underlying standard; or

(iv) Adopt a revised temporary modification with an appropriate expiration date.

**(4) Granting, Extending and Removing Variances to Numeric Standards**

A variance to a water quality standard may be granted by the Water Quality Control Commission when the criteria of this subsection are met. The presence of the variance will be indicated in the appropriate water quality standards regulation. When the variance expires or is removed by the Commission, the underlying standard will be in full effect. In every case, the variance to the standard shall be temporary and must be re-examined not less than once every three years.

(a) Criteria for Granting a Discharger-Specific Variance

Variances to numeric standards are authorized only where a comprehensive alternatives analysis demonstrates that there are no feasible alternatives that would allow for the regulated activity to proceed without a discharge that exceeds water quality-based effluent limits. In addition, an applicant for a variance must satisfy both of the following criteria.

(i) Tests to Determine the Need for a Variance

(A) Limits of Technology: Demonstration that attaining the water quality standard is not feasible because, as applied to the point source discharge, pollutant removal techniques are not available or it is technologically infeasible to meet the standard;

(B) Economics: Demonstration that attaining the water quality standard is not feasible because meeting the standard, as applied to the point source discharge, will cause substantial and widespread adverse social and economic impacts in the area where the discharge is located. Considerations include such factors as the cost and affordability of pollutant removal techniques; or

(C) Other Consequences: Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.

(ii) Demonstration that the conditions for granting a temporary modification are not met; or, if those conditions are met, determination by the Commission, after considering the site-specific circumstances, that granting a variance under this subsection is preferable as a matter of policy.

(b) Selection of Alternative Effluent Limits

An applicant for a variance shall submit a comprehensive alternatives analysis regarding pollutant removal techniques. Variances approved by the Commission shall be incorporated into the relevant standards tables based upon an evaluation of the alternatives analysis and consideration of the impact of the variance on the uses of the water body in the area of the variance and downstream of that area. A variance will be expressed as a temporary hybrid standard, which represents the highest degree of protection of the classified use that is feasible within 20 years, taking into consideration the factors in subsection 31.7(4)(a), as appropriate, and must maintain and protect existing uses in a manner consistent with federal requirements.

(i) The first number is the underlying standard previously adopted by the Commission for the segment and represents the long-term goal for the waterbody. The first number will be used for assessing attainment for the waterbody and for the development of effluent limitations.

(ii) The second number (or narrative condition) is the Commission's determination of the effluent concentration with the highest degree of protection of the classified use that is feasible for specific discharger named in the variance.

(iii) Control requirements, such as discharge permit effluent limitations, shall be established using the first number as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number during the term of the variance for the named discharger.

(c) Duration of a Variance

When a variance is granted, the duration of the variance will be set by the Commission. The duration of a variance shall be determined on a case-by-case basis, based upon all relevant factors, including the potential for achieving more protective effluent levels.

(d) Considerations for Extending a Variance

A variance shall not be extended if the permittee did not submit the reports required under section 31.9(5) and substantially comply with all other conditions of the variance.

## 31.8 ANTIDEGRADATION

### (1) Antidegradation Rule

(a) The highest level of water quality protection applies to certain waters that constitute an outstanding state or national resource. These waters, which are those designated outstanding waters pursuant to section 31.8(2)(a), shall be maintained and protected at their existing quality. Short-term degradation of existing quality is allowed for activities that result in long-term ecological or water quality benefit or clear public interest.

(b) An intermediate level of water quality protection applies to waters that have not been designated outstanding waters or use-protected waters. These waters shall be maintained and protected at their existing quality unless it is determined that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. For these waters, no degradation is allowed unless deemed appropriate following an antidegradation review in accordance with section 31.8(3), except as specified in (i) and (ii) below. Further, all applicable statutory and regulatory requirements for point sources and, if applicable control regulations have been adopted, all cost-effective and reasonable best management practices for nonpoint sources shall be met.

(i) For dissolved iron, dissolved manganese, and sulfate, concentrations may reach the applicable water supply standard without an antidegradation review provided degradation for Aquatic Life based standards is not significant.

(ii) For all other pollutants, no degradation is allowed, unless deemed appropriate following an antidegradation review in accordance with section 31.8(3).

(c) At a minimum, for all state surface waters existing classified uses and the level of water quality necessary to protect such uses shall be maintained and protected. No further water quality degradation is allowable which would interfere with or become injurious to these uses. The classified uses shall be deemed protected if the narrative and numerical standards are not exceeded.

The antidegradation review requirements in section 31.8(3) are not applicable to waters designated use-protected pursuant to section 31.8(2)(b). For these waters, only the protection specified in this subparagraph applies.

(d) Water quality designations and reviewable water provisions shall not be utilized in a manner that is contrary to the provisions of sections 25-8-102 and 25-8-104, C.R.S.

**(2) Water Quality-Based Designations**

Waters which satisfy the criteria in subparagraph (a) below may be designated by the Commission as “outstanding waters”. Waters which satisfy the criteria in subparagraph (b) below may be designated “use-protected.” Waters not satisfying either set of criteria will remain undesignated, and will be subject to the antidegradation review provisions set forth in section 31.8(3), below.

(a) <u>Outstanding Waters Designation</u>

Waters may be designated outstanding waters where the Commission makes all of the following three determinations:

(i) The existing quality for each of the following parameters is equal to or better than that specified in tables I, II, and III for the protection of aquatic life class 1, recreation class P and (for nitrate) domestic water supply uses:

Table I: dissolved oxygen, pH, *E. coli*

Table II: chronic ammonia, nitrate

Table III: chronic cadmium, chronic copper, chronic lead, chronic manganese, chronic selenium, chronic silver, and chronic zinc

The determination of existing quality shall be based on adequate representative data, from samples taken within the segment in question. Data must be available for each of

the 12 parameters listed; provided, that if *E. coli* samples from within the segment are infeasible due to its location, and a sanitary survey demonstrates that there are no human sources present that are likely to impact quality in the segment in question, *E. coli* data will not be required. “Existing quality” shall be the 85th percentile of the data for ammonia, nitrate, and dissolved metals, the 50th percentile for total recoverable metals, the 15th percentile for dissolved oxygen, the geometric mean for *E. coli*, and the range between the 15th and 85th percentiles for pH.

In addition, the foregoing notwithstanding, this test shall not be considered to be met if the Commission determines that, due to the presence of substantial natural or irreversible human-induced pollution for parameters other than those listed above, the quality of the waters in question should not be considered better than necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

(ii) The waters constitute an outstanding natural resource, based on the following:

(A) The waters are a significant attribute of a State Gold Medal Trout Fishery, a National Park, National Monument, National Wildlife Refuge, or a designated Wilderness Area, or are part of a designated wild river under the Federal Wild and Scenic Rivers Act; or

(B) The Commission determines that the waters have exceptional recreational or ecological significance, and have not been modified by human activities in a manner that substantially detracts from their value as a natural resource.

(iii) The water requires protection in addition to that provided by the combination of water quality classifications and standards and the protection afforded reviewable water under section 31.8(3).

(b) <u>Use-Protected Designation</u>

These are waters that the Commission has determined do not warrant the special protection provided by the outstanding waters designation or the antidegradation review process.

(i) Waters shall be designated by the Commission use-protected if any of the criteria below are met, except that the Commission may determine that those waters with exceptional recreational or ecological significance should be undesignated, and deserving of the protection afforded by the antidegradation review provisions of section 31.8(3):

(A) The use classifications of the waters include aquatic life warm water class 2, except as provided in subsection (iii) below;

(B) The existing quality for at least three of the following parameters is worse than that specified in tables I, II and III for the protection of aquatic life class 1, recreation class P and (for nitrate) domestic water supply uses:

Table I: dissolved oxygen, pH, E. coli

Table II: chronic ammonia, nitrate

Table III: chronic cadmium, chronic copper, chronic lead, chronic manganese, chronic selenium, chronic silver, and chronic zinc

The determination of existing quality shall be based on adequate representative data, from samples taken within the segment in question. Data must be available

for each of the 12 parameters listed; provided, that if *E. coli* samples from within the segment are infeasible due to its location, and a sanitary survey demonstrates that there are no human sources present that are likely to impact quality in the segment in question, *E. coli* data will not be required. “Existing quality” shall be as defined in 31.5; or

(C) The water body was an effluent-dominated or effluent-dependent stream during the period 2000-2009, except that the Commission may determine that the water body should be undesignated, and subject to the protection provided by the antidegradation review process, based on the water body's public resource value and ecological significance. (This provision shall be repealed effective 12/31/2019)

(ii) In addition, waters may be designated use protected even though none of the preceding criteria apply if the Commission determines that due to the presence of substantial natural or irreversible human induced pollution for parameters other than those listed in section 31.8(2)(b)(i)(B) the quality of the waters in question should not be considered better than necessary to support aquatic life class 1 and/or recreation class P uses. In making such a determination about a use-protected designation, the Commission may take into account evidence of exceedances of one or more of the parameters listed in section 31.8(2)(b)(i)(B).

(iii) Waters classified as aquatic life warm water class 2 shall not be designated use-protected solely on the basis of such classification if:

(A) There is adequate representative data available from samples taken within the segment in question for each of the 12 parameters listed in subsection 31.8(2)(b)(i)(B), above, and that data shows that the existing quality for at least 10 of the 12 parameters is equal to or better than that specified in tables I, II and III for the protection of aquatic life class 1, recreation class P and (for nitrate) domestic water supply uses; and

(B) The segment in question is not listed, and does not qualify for listing, for two or more pollutants on Colorado’s Section 303(d) List of Water-Quality-Limited Segments Requiring Total Maximum Daily Loads, for an exceedance of chronic or “30-day” numeric standards.

**(3) Antidegradation Review Process**

(a) Applicability

These antidegradation review procedures shall apply to the review of regulated activities with new or increased water quality impacts that may degrade the quality of state surface waters that have not been designated as outstanding waters or use-protected waters, including waters previously designated as high quality class 2. These waters are referred to below as “reviewable waters.” “Regulated activities” means any activities which require a discharge permit or water quality certification under federal or state law, or which are subject to state control regulations unless the Commission has specified in the control regulation that the antidegradation review process is not applicable. Where possible, the antidegradation review should be coordinated or consolidated with the review processes of other agencies concerning a proposed activity in an effort to minimize costs and delays for such activities.

(b) Division and Commission Roles

For regulated activities, the significance determination set forth in section 31.8(3)(c) and the determination whether degradation is necessary to accommodate important economic or social development in the area in which the waters are located, pursuant to section 31.8(3)(d), shall be made by the Division, subject to a de novo review by the Commission in an adjudicatory hearing, on the Commission's own motion, pursuant to a petition by any interested person who has submitted written comments during the Division review process, or on the Commission's determination pursuant to section 24-4-105(2), C.R.S.

(c) Significance Determination

The initial step in an antidegradation review shall be a determination whether the regulated activity in question is likely to result in significant degradation of reviewable waters, with respect to adopted narrative or numeric standards. The significance determination will be based on the chronic numeric standard and flow for the pollutant of concern except for those pollutants which have only acute numeric standards in which case the acute standard and flow will be used. This significance determination shall be made with respect to the net effect of the new or increased water quality impacts of the proposed regulated activity, taking into account any environmental benefits resulting from the regulated activity and any water quality enhancement or mitigation measures impacting the segment or segments under review, if such measures are incorporated with the proposed regulated activity. The regulated activity shall be considered not to result in significant degradation, as measured in the reviewable waters segment, if:

(i) For bioaccumulative toxic pollutants, (i.e., those chemicals for which the bioaccumulation factor (BAF) is equal to or greater than 1000) the new or increased loading from the source under review is less than 10 percent of the existing total load to that portion of the segment impacted by the discharge for critical constituents; provided, that the cumulative impact of increased loadings from all sources shall not exceed 10 percent of the baseline total load established for the portion of the segment impacted by the discharge (the baseline total load shall be determined at the time of the first proposed new or increased water quality impacts to the reviewable waters.); and

(ii) For all pollutants:

(A) The flow rate or volume of a new or increased discharge under review is small enough that it will be diluted by 100 to 1 or more at low flow, as defined in section 31.9, by water in the stream; or

(B) The new activity or increased discharge from the source under review will consume, after mixing, less than 15 percent of the baseline available increment, provided that the cumulative increase in concentration from all sources shall not exceed 15 percent of the baseline available increment. The baseline available increment is the increment between low-flow pollutant concentrations and the relevant standards for critical constituents for that portion of the segment impacted by the discharge. Except as identified in (C) below, the baseline low-flow pollutant concentration shall represent the water quality as of September 30, 2000 (or the effective date when the use-protected designation is removed), and shall be determined at the time of the first proposed new or increased water quality impacts to the reviewable waters after that date.

(C) If water quality subsequently improves as the result of the remediation of impacts from past unpermitted releases of contaminants that affected the water quality as of September 30, 2000 (or the effective date when the use-protected designation is removed), the resulting improved water quality at the time of the proposed new water quality impacts shall be used as the baseline. However, if such improvement results from non-legally-mandated remediation, upon petition the Commission may determine an alternative baseline to be used for

antidegradation review purposes, taking into account the site-specific circumstances, including the benefits of protecting improved water quality and the goal of not discouraging voluntary clean-up efforts, including water pollutant trading. Any individual or entity, including those involved in the remediation efforts, may petition the Commission, at any time, to establish an alternative baseline, including prior to proceeding with a remediation project.

(D) The regulated activity will result in only temporary or short term changes in water quality. This exception shall not apply where long-term operation of the regulated activity will result in an adverse change in water quality.

For the purposes of this subsection, the phrase “portion of the segment impacted by the discharge” means the portion of the stream from the discharge point to the first major tributary inflow, or as determined by the Division based on site-specific information at the time of the analysis.

(d) Necessity of Degradation Determination

If a determination has been made in accordance with section 31.8(3)(c) that a proposed regulated activity is likely to result in significant degradation of reviewable waters, a determination shall be made pursuant to this section whether the degradation is necessary to accommodate important economic or social development in the area in which the waters are located. The following provisions shall apply to this determination:

(i) The “area in which the waters are located” shall be determined from the facts on a case-by-case basis. The area shall include all areas directly impacted by the proposed regulated activity.

(ii) A determination shall be made from the facts on a case-by-case basis whether the proposed regulated activity is important economic or social development. If the activity proponent submits evidence that the regulated activity is important development, it shall be presumed important unless information to the contrary is submitted in the public review process. The determination shall take into account information received during the public comment period and shall give substantial weight to any applicable determinations by local governments or land use planning authorities.

(iii) If the proposed regulated activity is determined to be important economic or social development, a determination shall be made whether the degradation that would result from such regulated activity is necessary to accommodate that development. The degradation shall be considered necessary if there are no water quality control alternatives available that (A) would result in no degradation or less degradation of the state waters and (B) are determined to be economically, environmentally, and technologically reasonable. In situations where water quality control alternatives are identified that satisfy the tests in (A) and (B), the Division shall consider the proposed degradation to be unnecessary, and require implementation of a non-degrading or less degrading alternative as a condition of authorizing the proposed activity.

This determination shall be based on an assessment of whether such alternatives are available, based upon a reasonable level of analysis by the project proponent, consistent with accepted engineering practice, and any information submitted by the public or which is otherwise available. The assessment shall address practical water quality control technologies, the feasibility and availability of which has been demonstrated under field conditions similar to those of the activity under review. The scope of alternatives considered shall be limited to those that would accomplish the proposed regulated activity's purpose. Any alternatives that would be inconsistent with section 25-8-104 of the Water Quality Control Act shall not be considered available alternatives.

In determining the economic reasonableness of any less-degrading water quality control alternatives, the Division may take into consideration any relevant factors, including but not limited to the following, if applicable:

(A) Whether the costs of the alternative significantly exceed the costs of the proposal;

(B) For publicly owned treatment works (POTWs) or public water supply projects, whether user charges resulting from the alternative would significantly exceed user charges for similarly situated POTWs or public water supply projects;

(C) For private industry, whether the alternative would have a significant adverse effect upon the project's profitability or competitive position (if the project proponent chooses to provide such information);

(D) For any dischargers, whether treatment costs resulting from the alternative would significantly exceed treatment costs for any similar existing dischargers on the segment in question.

(E) The relative, long-term, energy costs and commitments and availability of energy conservation alternatives.

(e) Public Participation and Intergovernmental Coordination

Procedural provisions relating to public participation and intergovernmental coordination and antidegradation reviews are set forth in the Procedural Rules, Regulation No. 21, section 21.16 (5 CCR 1002-21).

(f) Public Nomination-Water Quality Based Designations

Any person may nominate any state water for designation as outstanding waters or use-protected during triennial review or at any time. Such nomination shall include written documentation of the qualifications for such designation based upon the criteria in section 31.8(2)(a) or (b).

(g) Protection of Existing Uses

If, during an antidegradation review, it is determined that an existing use of the affected waterbody has not been classified, prior to completing the antidegradation review for an applicable regulated activity, an expeditious rulemaking hearing shall be held (on an emergency basis if necessary) to consider adoption of the additional classification.

## 31.9 IMPLEMENTATION OF STANDARDS

### (1) Low Flow Exceptions

(a) Water quality standards shall apply at all times; provided, that in developing effluent limitations or other requirements for discharge permits, the Division shall normally define critical flow conditions using the following low-flow values:

(i) Generally: the empirically based 30-day average low flow with an average 1-in-3 year recurrence interval (30E3) for chronic standards and the empirically based 1-day low flow with an average 1-in-3 year recurrence interval (1E3) for acute standards, or the equivalent statistically-based flow.

(ii) Temperature limitations: the empirically based 7-day average low flow with an average 1-in-3 year recurrence interval (7E3), and the empirically based 1-day low flow with an average 1-in-3 year recurrence interval (1E3) for acute standards, or the equivalent statistically-based flow.

(iii) Total phosphorus and total nitrogen limitations: the annual median of the daily average flows with a 1 in 5 year recurrence interval.

(b) Data Requirements

The period of record for determining low flows shall be based on a minimum of ten years of flow data, except that, when ten years of data is not available, low flows may be determined, on a case-by-case basis, using a period of record of less than ten years. If more than ten years of flow data is available, it may be more appropriate to establish low flow conditions based on a longer period of record to more accurately reflect site specific conditions.

(c) Streams With Rapid Flow Changes

For streams with seasonal rapidly rising or falling hydrographs, the Division shall use, if so requested by a discharger, the procedure set forth in subparagraphs (i) through (v) below for calculating 30E3 values for those transitional flow periods of the year. For certain substances such as ammonia, the low flow exceptions may be based on periodic or seasonal flows as determined on a case-by-case basis by the Division.

(i) Averaging Procedure – Calculation of 30-day Forward Moving Harmonic Means - Moving harmonic means shall first be calculated for each consecutive thirty-day period in the period of record being considered.

(ii) Calculate Annual 30E3 Value - Determine the annual 30E3 value using the procedure set forth in Appendix A using

(A) 30-day forward moving harmonic means, and

(B) the excursion procedure for a 1-in-3 year recurrence interval.

(iii) Assigning Harmonic Means - Each 30-day harmonic mean shall then be assigned to a month. A harmonic mean shall be assigned to a specific month only if the harmonic mean is calculated using data for 15 or more days from that month.

(iv) Ranking of Harmonic Means - Harmonic means shall be ranked from the lowest to highest for each month of the year. The lowest harmonic mean for a month shall be used to establish the low flow value for that month using the procedure set forth in subparagraph (v) below.

(v) Establishing Monthly 30E3 Low Flows – The low flow for a month shall be either the lowest harmonic mean assigned to that month (as determined in subparagraphs (iii) and (iv), above), or the annual low flow value (as determined in subparagraph (ii), above), whichever is greater.

(d) Waters Not Yet Classified

Discharges to waters not presently classified must meet established effluent limitation regulations, the basic standards, antidegradation rule and control regulations. Effluent flows which reach a classified body of water, even though the discharge point is to a water not yet

classified, must be of a quality which will not cause the standards of the classified body of water to be violated.

**(2) Compliance Schedules**

Where the Commission has adopted new standards, temporary modifications or revised standards that have become more stringent, or where the Division has developed new interpretations of existing standards, including, but not limited to, implementation requirements through approved TMDLs and Wasteload Allocations and antidegradation reviews; the Division may include schedules of compliance in Colorado Discharge Permit System (CDPS) permits when it determines such schedules to be necessary and appropriate.

**(3) Temperature Limits**

The Division will determine whether temperature limits are to be included in permits utilizing the following approach.

(a) No temperature effluent limit will be applied if a discharge is to an effluent-dependent stream and there is no evidence that the aquatic life use may be negatively affected by the thermal component of the discharge. In implementing this provision, the Division will consider all readily-available and pertinent evidence regarding the potential for the thermal properties of a discharge to affect aquatic life.

(b) No temperature effluent limit will be applied to a discharge of water from a natural hot springs, so long as that water enters the receiving water in the vicinity of its natural outflow.

(c) Where neither (a) nor (b) above apply to a discharge, the Division will determine whether a limitation for temperature is to be included in a permit consistent with procedures developed in accordance with Section 61.8(2)(b)(i) of the CDPS Regulations. Where there are not adequate data to determine reasonable potential, the Division may require the permittee to collect and submit temperature data.

(d) At the time of permit renewal, where a site-specific recalculation procedure demonstrates that alternative numerical criteria are more appropriate for protection of aquatic life, these alternative criteria will be used for development of permit limits.

(e) Consistent with section 316(a) of the federal Clean Water Act, and federal implementing regulations, the Division may impose alternate effluent limitations with respect to the thermal component of such discharge.

**(4) Temporary Modifications**

Where a temporary modification is adopted, permits for discharges to the segment in question:

(a) For existing discharges, will not include a compliance schedule to meet limits based on the underlying standard during the period that the temporary modification is in effect. The Division, where necessary and within a reasonable period of the expiration of a temporary modification, shall reopen any permit for a discharge to that segment and include a permit condition to attain limits based on the underlying standard.

(b) May include a permit condition requiring actions intended to eliminate the uncertainty regarding the appropriate underlying standard.

(c) Where a permit for an existing discharge is reissued while a temporary modification is in effect, the Division, based on best professional judgment, may determine limitations or other conditions

for the parameter(s) in question based on an assessment of the level of effluent quality reasonably achievable without requiring significant investment in facility infrastructure (e.g., based on past facility performance). Such limit (numerical or otherwise) may be at or below the level derived from the temporary modification where such a requirement would not cause an undue economic burden, but not more restrictive than necessary to achieve the underlying standard.

(d) The Division, based on best professional judgment, may set effluent limits in permits for new or expanding discharges at a level that does not pose an unreasonable risk to downstream uses.

**(5) Conditions on Discharger-Specific Variances**

A discharger-specific variance applies only to the point source specified in the variance and to the pollutant specified in the variance. A permit action issued to implement a discharger-specific variance shall require:

(a) For existing discharges, compliance with an initial effluent limitation which, at the time the variance is approved, at a minimum represents the level currently achieved. At the time a variance is approved, unless the alternative limit is currently achieved, a permit condition will be specified which requires progress toward the alternative effluent limitation as quickly as feasible.

(b) For new discharges, compliance with an initial effluent limitation which, at the time the variance is approved, represents the highest degree of protection of the classified use that is currently feasible, taking into consideration the factors in subsection 31.7(4)(a)(ii), as appropriate.

(c) Ongoing investigation of treatment technologies, process changes, wastewater reuse, or other controls that may result in improvement in effluent quality, and submission of reports on the investigations to allow for timely consideration of the information during the scheduled review of the variance by the Commission.

(d) Conditions in the permit as necessary to administer the variance including, but not limited to, additional monitoring requirements.

## 31.10 MIXING ZONES

**(1) Definitions**

(a) Physical Mixing Zone

That portion of a water body, surrounding or downstream from a point source of discharge, wherein constituents of the discharge are not uniformly dispersed into the receiving waters. The physical mixing zone also can be referred to simply as the “mixing zone,” except where there is possible confusion with the regulatory mixing zone, as it is defined below, which differs from the physical mixing zone

(b) Exceedence Zone

That portion of a physical mixing zone within which a numeric water quality standard for a given water quality parameter is not met during critical conditions. The size of an exceedence zone may differ from one numeric standard to another at a given location.

(c) Regulatory Mixing Zone

The maximum size allowable for an exceedence zone at a given location. An acute regulatory mixing zone limits the size of exceedence zones for acute standards, and a chronic regulatory mixing zone limits the size of exceedence zones for chronic standards. The sizes of the acute

and chronic regulatory mixing zones are related to the size of the receiving water, as explained in 31.10 (3).

(d) Stream Channel Width at Bankfull Stage

The width of a stream under flow conditions when the stream just begins to enter the lowest level of the floodplain.

(e) Average Water Body Surface Area

The average surface area for a lake shall be determined from historic data (five years or more if possible), and must be computed monthly or seasonally, as appropriate, to reflect significant monthly or seasonal changes in area.

(f) Stream, Lake, Wetland

For purposes of this regulation, streams will include Waters of the State that flow, regardless of size, and lakes will include Waters of the State that are not flowing, including reservoirs. Wetlands will be treated in the same manner as lakes.

**(2) Exemptions from Restriction of Permit Limits by Mixing Zone Regulations**

In the following instances, water quality standards-based effluent limits (permit limits) for discharges to streams will be calculated using the full chronic (30E3) and acute (1E3) low flow of the stream for dilution except where a more stringent approach is determined by the Division to be necessary to protect designated uses in the water body as a whole based on the factors identified in subsection 31.10(5). These exemptions do not apply to lakes.

(a) Exemption tables, other procedures developed or approved by the Division, or site-specific data indicate that the chronic regulatory mixing zone is larger than the physical mixing zone;

(b) The effluent flow at maximum permitted discharge is greater than twice the chronic low flow (30E3); or

(c) The ratio of the chronic low flow (30E3) to the maximum permitted or other appropriate effluent flow is greater than or equal to 20:1 and the operation is designated by the Division as a “minor.”

**(3) Regulatory Mixing Zone Sizes**

(a) Streams

The Division shall consider the following factors in determining the sizes of the regulatory mixing zones for streams:

(i) The size of the chronic regulatory mixing zone for any point source of discharge to a stream shall not be greater than a plan view area equal to six times the square of the stream channel width at bankfull stage.

(ii) Where the size of the physical mixing zone exceeds the size of the chronic regulatory mixing zone, the area of the acute regulatory mixing zone for a water quality parameter shall be established between 10 % and 25 % of the area of the chronic regulatory mixing zone for the same water quality parameter. The size of the acute regulatory mixing zone will be determined within this range based on a presumption that:

(A) For waters determined under subsection 31.8 to be “reviewable,” the default acute regulatory mixing zone will be 10% as large as the chronic regulatory mixing zone.

(B) For waters determined under subsection 31.8 to be “use protected,” the default acute regulatory mixing zone will be 25% as large as the chronic regulatory mixing zone.

An acute mixing zone may also be further reduced below default limits for reasons given in subsection 31.10(5). The permittee may request that the size of the acute regulatory mixing zone be higher than recommended by the Division, but no higher than 25% of the chronic regulatory mixing zone, on the basis of arguments related to cost/benefit analysis, economic reasonableness, ecological risks, use classification, or designation. The burden is on the permittee to bring appropriate information to the Division.

(iii) The sum total of the plan view areas of all chronic regulatory mixing zones for point sources of discharge into any reach of stream for a specified water quality parameter shall not occupy more than ten percent 10% of the total plan view area of such reach of river or stream, as measured at bankfull stage. The length (approximately 10 miles) and boundaries of the stream or river reach for these purposes shall be determined by the Division. Constraints on chronic regulatory mixing zones used to determine permit limits in discharge permits resulting from the cumulative impacts of multiple point sources of discharge into a stream reach shall be shared equitably among permittees and any other sources of discharge. The distribution of the allowable loads for the pollutant of concern shall be consistent with regulations applicable to total maximum daily loads and/or upon mutual agreement amongst the permittees.

(b) <u>Lakes</u>

The Division shall consider the following factors in determining the size of the regulatory mixing zones for lakes:

(i) For each point source of discharge, the size of the chronic regulatory mixing zone shall not be greater than 3% of the average inter-annual seasonal or monthly surface area. The Division may apply this limit to an entire lake or to a smaller, geographically distinguishable (bay, arm, etc.), portion of a lake.

(ii) Where the physical mixing zone exceeds the chronic regulatory mixing zone, the area of the acute regulatory mixing zone for lakes, for any water quality parameter, shall be established between 10% and 25% of the area of the chronic regulatory mixing zone for the same water quality parameter. The size of the acute mixing zone will be determined within this range based on a presumption that:

(A) For waters determined under subsection 31.8 to be “reviewable” the default acute regulatory mixing zone will be 10% as large as the chronic regulatory mixing zone.

(B) For waters determined under subsection 31.8 to be “use protected” the default acute regulatory mixing zone will be 25% as large as the chronic regulatory mixing zone.

An acute mixing zone may also be further reduced below default limits for reasons given in subsection 31.10 (5). The permittee may request that the size of the acute regulatory mixing zone be higher than recommended by the Division, but no higher than 25% of the chronic regulatory mixing zone, on the basis of arguments related to cost/benefit

analysis, economic reasonableness, ecological risks, use classification, or designation. The burden is on the permittee to bring appropriate information to the Division.

(iii) The sum total of the plan view areas of all chronic regulatory mixing zones for point sources of discharge into lakes for a specified water quality parameter shall not occupy more than ten percent 10% of the total plan view area of such lake, or a geographically distinguishable portion thereof, at any seasonally average area. Constraints on chronic regulatory mixing zones used to determine limits in discharge permits resulting from the cumulative impacts of multiple point sources of discharge into lakes shall be shared equitably among permittees and any other sources of discharge. The distribution of the allowable loads for the pollutant of concern shall be consistent with regulations applicable to total maximum daily loads and/or upon mutual agreement amongst the permittees.

(iv) For artificial lakes supplied principally with potable water, mixing zones larger than those allowed above may be designated for purposes of CDPS permits. Appropriate mixing zone size limits shall be determined by the Division on a case-by-case basis, consistent with the constraints described in subsection 31.10(5). Such mixing zones shall be kept as small as practicable, on a parameter-by-parameter basis, and shall provide for protection of existing and designated uses in the water body as a whole.

**(4) Use of Mixing Zone Regulations in Setting Permit Limits**

(a) Streams

Computation of chronic or acute permit limits for point source discharges to streams shall be as follows:

(i) For discharges not exempted as explained in subsection 31.10(2), the permit limit for any parameter for which there is a water quality standard shall be that resulting in acute and chronic exceedance zones equal to or smaller than the respective acute and chronic regulatory mixing zones.

(ii) Where the annual acute low flow (1E3) of the receiving stream is zero, no dilution will be provided in calculating acute permit limits. Where the chronic low flow (30E3) of the receiving stream is equal to zero, no dilution will be provided in calculating chronic permit limits.

(b) Lakes

Computation of chronic or acute permit limits for point source discharges to lakes shall be as follows:

(i) The permit limit for any parameter for which there is a water quality standard shall be that resulting in acute and chronic exceedence zones equal to or smaller than the respective acute and chronic regulatory mixing zones as shown by site-specific analysis for each regulated substance.

**(5) Additional Constraints on Mixing Zones**

(a) Exceedence zones from multiple point sources of discharge shall not overlap to such an extent as to harm beneficial uses.

(b) Regulatory mixing zones shall comply with the narrative basic standards included in subsection 31.11(1), except that these requirements do not apply to the protection of any sessile organisms residing within acute and chronic regulatory mixing zones.

(c) Where sampling shows that the conditions described in subsection 31.10(3) are not attained, the mixing zone analysis will be revised as necessary to achieve compliance with subsection 31.10(3).

(d) The Division may limit or deny regulatory mixing zones on a site-specific basis for specific regulated substances. In doing so, the Division shall consider the following:

(i) The need to provide a zone of passage for aquatic life;

(ii) The likelihood of bioaccumulation of toxins in fish or wildlife;

(iii) The special importance of certain habitat such as fish spawning or nursery areas or habitat that supports threatened or endangered species;

(iv) Potential for human exposure to pollutants through drinking water or recreation;

(v) The possibility that aquatic life will be attracted to the effluent plume;

(vi) The potential for adverse effects on groundwater; or

(vii) The toxicity or persistence of the substance discharged.

**(6) Mixing Zones for Whole Effluent Toxicity-based Permit Requirements**

The provisions of this section 31.10 do not apply to the determination of whole effluent toxicity-based permit requirements.

## 31.11 BASIC STANDARDS APPLICABLE TO SURFACE WATERS OF THE STATE

All surface waters of the state are subject to the following basic standards; however, discharge of substances regulated by permits which are within those permit limitations shall not be a basis for enforcement proceedings under these basic standards:

(1) Except where authorized by permits, BMPs, 401 certifications, or plans of operation approved by the Division or other applicable agencies, state surface waters shall be free from substances attributable to human-caused point source or nonpoint source discharge in amounts, concentrations or combinations which:

(a) for all surface waters except wetlands;

(i) can settle to form bottom deposits detrimental to the beneficial uses. Depositions are stream bottom buildup of materials which include but are not limited to anaerobic sludges, mine slurry or tailings, silt, or mud; or

(ii) form floating debris, scum, or other surface materials sufficient to harm existing beneficial uses; or

(iii) produce color, odor, or other conditions in such a degree as to create a nuisance or harm existing beneficial uses or impart any undesirable taste to significant edible aquatic species or to the water; or

(iv) are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life; or

(v) produce a predominance of undesirable aquatic life; or

(vi) cause a film on the surface or produce a deposit on shorelines; and

(b) for surface waters in wetlands;

(i) produce color, odor, changes in pH, or other conditions in such a degree as to create a nuisance or harm water quality dependent functions or impart any undesirable taste to significant edible aquatic species of the wetland; or

(ii) are toxic to humans, animals, plants, or aquatic life of the wetland.

(2) The radioactive materials in surface waters shall be maintained at the lowest practical level. In no case shall radioactive materials in surface waters be increased by any cause attributable to municipal, industrial, or agricultural practices or discharges to as to exceed the following levels, unless alternative site-specific standards have been adopted pursuant to subsection (4) below:

| Radionuclide Standards | |
|---|---|
| Parameter | Picocuries per Liter |
| Americium 241* | 0.15 |
| Cesium 134 | 80 |
| Plutonium 239, and 240* | 0.15 |
| Radium 226 and 228* | 5 |
| Strontium 90* | 8 |
| Thorium 230 and 232* | 60 |
| Tritium | 20,000 |

*Radionuclide samples for these materials should be analyzed using unfiltered (total) samples. These Human Health based standards are 30-day average values for both plutonium and americium.

(3) The interim organic pollutant standards contained in the following Basic Standards for Organic Chemicals Table are applicable to all surface waters of the state for which the corresponding use classifications have been adopted, unless alternative site-specific standards have been adopted pursuant to sub-section (4) below.

Note that all standards in the Basic Standards for Organic Chemicals Table are being adopted as “interim standards.” These interim standards will remain in effect until alternative permanent standards are adopted by the Commission in revisions to this regulation or site-specific standards determinations. Although fully effective with respect to current regulatory applications, these interim standards shall not be considered final or permanent standards subject to antibacksliding or downgrading restrictions.

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Acenaphthene | 83-32-9 | 420 | 420 | ---[10] | 1,700 | 520 |
| Acetochlor | 34256-82-1 | 140 | --- | --- | --- | --- |
| Acetone | 67-64-1 | 6300 | --- | --- | --- | --- |
| Acrolein | 107-02-8 | 3.5 | 3.5 | 9.3 | 68 | 21 |
| Acrylamide[C, 13] | 79-06-1 | 0.022 | --- | --- | --- | --- |
| Acrylonitrile[C] | 107-13-1 | 0.065 | 0.051 | 0.25 | 7,500 | 2,600 |
| Alachlor | 15972-60-8 | 2[M] | 2 | 140 | --- | --- |
| Aldicarb | 116-06-3 | 7[M] | --- | --- | --- | --- |
| Aldicarb Sulfone | 1646-88-4 | 7[M] | --- | --- | --- | --- |
| Aldicarb Sulfoxide | 1646-87-3 | 7[M] | --- | --- | --- | --- |
| Aldrin[C] | 309-00-2 | 0.0021 | $4.9X10^{-5}$ | $5.0X10^{-5}$ | 1.5 | --- |
| Aniline[C] | 62-53-3 | 6.1 | --- | --- | --- | --- |
| Anthracene (PAH) | 120-12-7 | 2,100 | 2,100 | 40,000 | --- | --- |
| Aramite[C] | 140-57-8 | 1.4 | --- | --- | --- | --- |
| Atrazine | 1912-24-9 | 3[M] | --- | --- | --- | --- |
| Azobenzene[C] | 103-33-3 | 0.32 | --- | --- | --- | --- |
| Benzene[C, 12] | 71-43-2 | 2.3 to 5[M] | 2.2 | 51 | 5,300 | --- |
| Benzidine[C] | 92-87-5 | 0.00015 | $8.6X10^{-5}$ | 0.00020 | 2,500 | --- |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Benzo(a)anthracene (PAH)[C] | 56-55-3 | 0.0048 | 0.0038 | 0.018 | --- | --- |
| Benzo(a)pyrene (PAH)[C, 12] | 50-32-8 | 0.0048 to 0.2[M] | 0.0038 | 0.018 | --- | --- |
| Benzo(b)fluoranthene (PAH)[C] | 205-99-2 | 0.0048 | 0.0038 | 0.018 | --- | --- |
| Benzo(k)fluoranthene (PAH)[C] | 207-08-9 | 0.0048 | 0.0038 | 0.018 | --- | --- |
| Benzo(g,h,i)perylene (PAH) | 191-24-2 | --- | 0.0038 | 0.018 | --- | --- |
| Benzotrichloride[C] | 98-07-7 | 0.0027 | --- | --- | --- | --- |
| Benzyl chloride[C] | 100-44-7 | 0.21 | --- | --- | --- | --- |
| Biphenyl[C] | 92-52-4 | 4.4 | --- | --- | --- | --- |
| Bis(chloromethyl)ether (BCME)[C] | 542-88-1 | 0.00016 | 0.0001 | 0.0003 | --- | --- |
| Bromate[C] | 15541-45-4 | 0.050 | --- | --- | --- | --- |
| Bromobenzene | 108-86-1 | 56 | --- | --- | --- | --- |
| Bromodichloromethane (HM)[C] | 75-27-4 | --- | 0.55 | 17 | 11,000 | --- |
| Bromoform (HM)[C] | 75-25-2 | --- | 4.3 | 140 | --- | --- |
| ButylBenzyl phthalate | 85-68-7 | 1,400 | 1,400 | 1,900 | --- | --- |
| Carbofuran[C, 12] | 1563-66-2 | 35 to 40[M] | --- | --- | --- | --- |
| Carbon tetrachloride[C, 12] | 56-23-5 | 0.5 to 5[M] | 0.43 | 3.0 | 35,200 | --- |
| Chlordane[C, 12] | 57-74-9 | 0.10 to 2[M] | 0.00080 | 0.00081 | 1.2 | 0.0043 |
| Chlordecone[C] | 143-50-0 | 0.0035 | --- | --- | --- | --- |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Chlorethyl ether (BIS-2)[C] | 111-44-4 | 0.032 | 0.030 | 0.53 | --- | --- |
| Chlorobenzene[11] | 108-90-7 | 100[M] | 100 | 1,600 | --- | --- |
| Chlorodibromomethane (HM)[11] | 124-48-1 | --- | 54.0 | 1,700 | --- | --- |
| Chloroform (HM)[C] | 67-66-3 | --- | 3.4 | 110 | 28,900 | 1,240 |
| Chloroisopropyl ether(BIS-2) | 108-60-1 | 280 | 280 | 65,000 | --- | --- |
| 4-Chloro-3-methylphenol | 59-50-7 | 210 | --- | --- | 30 | --- |
| Chloronapthalene | 91-58-7 | 560 | 560 | ---[10] | 2,300 | 620 |
| Chlorophenol,2- | 95-57-8 | 35 | 35 | 150 | 4,380 | 2,000 |
| Chlorphrifos | 2921-88-2 | 21 | --- | --- | 0.083 | 0.041 |
| Chrysene (PAH)[C] | 218-01-9 | 0.0048 | 0.0038 | 0.018 | --- | --- |
| DDD[C] | 72-54-8 | 0.15 | 0.00031 | 0.00031 | 0.6 | --- |
| DDE[C] | 72-55-9 | 0.1 | 0.00022 | 0.00022 | 1,050 | --- |
| DDT[C] | 50-29-3 | 0.1 | 0.00022 | 0.00022 | 0.55 | 0.001 |
| Dalapon | 75-99-0 | 200[M] | --- | --- | --- | --- |
| Demeton | 8065-48-3 | --- | --- | --- | --- | 0.1 |
| Diazinon | 333-41-5 | --- | --- | --- | 0.17 | 0.17 |
| Dibenzo(a,h)anthracene (PAH)[C] | 53-70-3 | 0.0048 | 0.0038 | 0.018 | --- | --- |
| 1,2 Dibromo-3-Chloropropane (DBCP) [C] | 96-12-8 | 0.2[M] | --- | --- | --- | --- |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Dibromoethane 1,2[C, 13] | 106-93-4 | 0.018 | --- | --- | --- | --- |
| Dicamba | 1918-00-9 | 210 | 170 | 860 | --- | --- |
| Dichloroacetic acid[C] | 79-43-6 | 0.7 | --- | --- | --- | --- |
| Dichlorobenzene 1,2[11] | 95-50-1 | 600[M] | 420 | 1,300 | --- | --- |
| Dichlorobenzene 1,3 | 541-73-1 | 94 | 94 | 960 | --- | --- |
| Dichlorobenzene 1,4[11] | 106-46-7 | 75[M] | 63 | 190 | --- | --- |
| Dichlorobenzidine[C] | 91-94-1 | 0.078 | 0.021 | 0.028 | --- | --- |
| Dichloroethane 1,2[C, 12] | 107-06-2 | 0.38 to 5[M] | 0.38 | 37 | 118,000 | 20,000 |
| Dichloroethylene 1,1 | 75-35-4 | 7[M] | 7 | 3,600 | --- | --- |
| Dichloroethylene 1,2-cis | 156-59-2 | 14 to 70[M] | --- | --- | --- | --- |
| Dichloroethylene 1,2-trans[11] | 156-60-5 | 100[M] | 100 | 10,000 | --- | --- |
| Dichloromethane (methylene chloride) [C, 12] | 75-09-2 | 5[M] | 4.6 | 590 | --- | --- |
| Dichlorophenol 2,4 | 120-83-2 | 21 | 21 | 290 | 2,020 | 365 |
| Dichlorophenoxyacetic acid (2,4-D) | 94-75-7 | 70[M] | --- | --- | --- | --- |
| Dichloropropane 1,2[C, 12] | 78-87-5 | 0.52 to 5[M] | 0.50 | 14 | 23,000 | 5,700 |
| Dichloropropylene 1,3[C] | 542-75-6 | 0.35 | 0.34 | 21 | 6,060 | 244 |
| Dichlorvos[C] | 62-73-7 | 0.12 | --- | --- | --- | --- |
| Dieldrin[C] | 60-57-1 | 0.002 | $5.2X10^{-5}$ | $5.4X10^{-5}$ | 0.24 | 0.056 |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Diethyl phthalate | 84-66-2 | 5,600 | 5,600 | 44,000 | --- | --- |
| Diisopropylmethylphosphonate (DIMP) | 1445-75-6 | 8 | --- | --- | --- | --- |
| Dimethylphenol 2,4 | 105-67-9 | 140 | 140 | 850 | 2,120 | --- |
| Dimethyl phthalate | 131-11-3 | 70,000 | 70,000 | 1,100,000 | --- | --- |
| Di-n-butyl phthalate | 84-74-2 | 700 | 700 | 4,500 | --- | --- |
| Dinitrophenol 2,4 | 51-28-5 | 14 | 14 | 5,300 | --- | --- |
| Dinitro-o-cresol 4,6 | 534-52-1 | 0.27 | 1.3 | 28 | --- | --- |
| Dinitrotoluene 2,4[C] | 121-14-2 | 0.11 | 0.11 | 3.4 | --- | --- |
| Dinitrotoluene 2,6[C] | 606-20-2 | --- | --- | --- | 330 | 230 |
| Dinoseb | 88-85-7 | 7[M] | --- | --- | --- | --- |
| Dioxane 1,4- | 123-91-1 | 0.35 | --- | --- | --- | --- |
| Dioxin (2,3,7,8 TCDD)[C, 12] | 1746-01-6 | $2.2 \times 10^{-7}$ to $3.0 \times 10^{-5}$[,M] | $5.0 \times 10^{-9}$ | $5.1 \times 10^{-9}$ | 0.01 | 0.00001 |
| Diphenylhydrazine 1,2[C] | 122-66-7 | 0.044 | 0.036 | 0.20 | 270 | --- |
| Di(2-ethylhexyl)adipate | 103-23-1 | 400[M] | --- | --- | --- | --- |
| Diquat[12] | 85-00-7 | 15 to 20[M] | --- | --- | --- | --- |
| Endosulfan | 115-29-7 | 42 | ---[10] | --- | 0.11 | 0.056 |
| Endosulfan, alpha | 959-98-8 | 42 | ---[10] | --- | 0.11 | 0.056 |
| Endosulfan, beta | 33213-65-9 | 42 | ---[10] | --- | 0.11 | 0.056 |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Endosulfan sulfate | 1031-07-8 | 42 | ---[10] | --- | 0.11 | 0.056 |
| Endothall | 145-73-3 | 100[M] | --- | --- | --- | --- |
| Endrin | 72-20-8 | 2[M] | ----[10] | --- | 0.086 | 0.036 |
| Endrin aldehyde | 7421-93-4 | 2.1 | 0.29 | 0.30 | --- | --- |
| Epichlorohydrin[C] | 106-89-8 | 3.5 | --- | --- | --- | --- |
| Ethylbenzene[11] | 100-41-4 | 700[M] | 530 | 2,100 | 32,000 | --- |
| Ethylene dibromide[C, 12] (1,2 – dibromoethane) | 106-93-4 | 0.02 to 0.05[M] | --- | --- | --- | --- |
| Ethylene glycol monobutylEther (EGBE) (2-Butoxyethanol) | 111-76-2 | 700 | --- | --- | --- | --- |
| Ethylhexyl phthalate (BIS-2)[C, 12] (DEHP) | 117-81-7 | 2.5to6[M] | 1.2 | 2.2 | --- | --- |
| Fluoranthene (PAH) | 206-44-0 | 280 | 130 | 140 | 3,980 | --- |
| Fluorene (PAH) | 86-73-7 | 280 | 280 | 5,300 | --- | --- |
| Folpet[C] | 133-07-3 | 10 | --- | --- | --- | --- |
| Furmecyclox[C] | 60568-05-0 | 1.2 | --- | --- | --- | --- |
| Glyphosate | 1071-83-6 | 700[M] | --- | --- | --- | --- |
| Guthion | 86-50-0 | --- | --- | --- | --- | 0.01 |
| Heptachlor[C, 12] | 76-44-8 | 0.008 to 0.4[M] | $7.8X10^{-5}$ | $7.9X10^{-5}$ | 0.52 | 0.0038 |
| Heptachlor epoxide[C, 12] | 1024-57-3 | 0.004 to 0.2[M] | $3.9X10^{-5}$ | $3.9X10^{-5}$ | 0.52 | 0.0038 |
| Hexachlorobenzene[C, 12] | 118-74-1 | 0.022 to 1.0[M] | 0.00028 | 0.00029 | --- | --- |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Hexachlorobutadiene | 87-68-3 | 0.45 | 0.44 | ---[10] | 90 | 9.3 |
| Hexachlorocyclohexane, Alpha[C] | 319-84-6 | 0.0056 | 0.0026 | 0.0049 | --- | --- |
| Hexachlorocyclohexane, Beta | 319-85-7 | 0.019 | 0.0091 | 0.017 | --- | --- |
| Hexachlorocyclohexane, Gamma (Lindane) | 58-89-9 | 0.2[M] | 0.2 | ---[10] | 0.95 | 0.08 |
| Hexachlorocyclohexane, Technical[C] | 608-73-1 | --- | 0.012 | 0.041 | 100 | --- |
| Hexachlorocyclopentadiene[11, 12] (HCCPD) | 77-47-4 | 42 to 50[M] | 40 | ---[10] | 7 | 5 |
| Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-hcdd)[C] | 19408-74-3 | 5.60E-06 | --- | --- | --- | --- |
| Hexachloroethane | 67-72-1 | 0.88 | 0.5 | 1.2 | 980 | 540 |
| Hexanone 2- | 591-78-6 | 35 | --- | --- | --- | --- |
| Hydrazine/Hydrazine sulfate[C] | 302-01-2 | 0.012 | --- | --- | --- | --- |
| Indeno(1,2,3-cd)pyrene (PAH)[C] | 193-39-5 | 0.0048 | 0.0038 | 0.018 | --- | --- |
| Isophorone[11] | 78-59-1 | 140 | 130 | 3,600 | --- | --- |
| Malathion | 121-75-5 | 140 | --- | --- | --- | 0.1 |
| Methanol | 67-56-1 | 14,000 | --- | --- | --- | --- |
| Methoxychlor[12] | 72-43-5 | 35 to 40[M] | ---[10] | --- | --- | 0.03 |
| Methyl bromide (HM) | 74-83-9 | --- | 9.8 | 1,500 | --- | --- |
| Methyl chloride (HM)[C] | 74-87-3 | --- | 5.6 | 180 | --- | --- |
| 4,4-Methylene bis (N,N'-dimethyl)aniline[C] | 101-61-1 | 0.76 | --- | --- | --- | --- |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Metribuzin | 21087-64-9 | 180 | 160 | 1,700 | --- | --- |
| Mirex | 2385-85-5 | 1.4 | --- | --- | --- | 0.001 |
| Naphthalene (PAH) | 91-20-3 | 140 | 140 | ---[10] | 2,300 | 620 |
| Nitrobenzene | 98-95-3 | 14 | 14 | 2,800 | 27,000 | --- |
| Nitrophenol 4 | 100-02-7 | 56 | 56 | 9,700 | --- | --- |
| NitrosodibutylamineN[C] | 924-16-3 | 0.0065 | 0.0043 | 0.012 | --- | --- |
| NitrosodiethylamineN[C] | 55-18-5 | 0.00023 | 0.00023 | 0.0083 | --- | --- |
| NitrosodimethylamineN[C] | 62-75-9 | 0.00069 | 0.00069 | 3.0 | --- | --- |
| N-Nitrosodiethanolamine[C] | 1116-54-7 | 0.013 | --- | --- | --- | --- |
| NitrosodiphenylamineN[C] | 86-30-6 | 7.1 | 3.3 | 6.0 | --- | --- |
| N-Nitroso-N-methylethylamine[C] | 10595-95-6 | 0.0016 | --- | --- | --- | --- |
| NitrosopyrrolidineN[C] | 930-55-2 | 0.017 | 0.016 | 36 | --- | --- |
| N-Nitrosodi-n-propylamine[C] | 621-64-7 | 0.005 | 0.005 | 0.50 | --- | --- |
| Nonylphenol | 84852-15-3 and 25154-52-3 | --- | --- | --- | 28 (effective1/1/2011) | 6.6 (effective1/1/2011) |
| Oxamyl (vydate)[12] | 23135-22-0 | 175 to 200[M] | --- | --- | --- | --- |
| PCBs[C, 9, 12] | 1336-36-3 | 0.0175 to 0.5[M] | $6.4X10^{-5}$ | $6.4X10^{-5}$ | 2.0 | 0.014 |
| Parathion | 56-38-2 | --- | --- | --- | 0.065 | 0.013 |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Pentachlorobenzene | 608-93-5 | 5.6 | 1.4 | 1.5 | --- | --- |
| Pentachlorophenol[C, 12] | 87-86-5 | 0.088 to 1.0[M] | 0.080 | 0.91 | 19[6] | 15[6] |
| Perchlorate | 7790-98-9 | 4.9 | --- | --- | --- | --- |
| Phenol | 108-95-2 | 2,100 | 2,100 | ---[10] | 10,200 | 2,560 |
| Picloram | 1918-02-1 | 490 | --- | --- | --- | --- |
| Prometon | 1610-18-0 | 100 | --- | --- | --- | --- |
| Propylene oxide[C] | 75-56-9 | 0.15 | --- | --- | --- | --- |
| Pyrene (PAH) | 129-00-0 | 210 | 210 | 4,000 | --- | --- |
| Quinoline[C] | 91-22-5 | 0.012 | --- | --- | --- | --- |
| Simazine | 122-34-9 | 4[M] | --- | --- | --- | --- |
| Styrene | 100-42-5 | 100[M] | --- | --- | --- | --- |
| Tetrachlorobenzene 1,2,4,5- | 95-94-3 | 2.1 | 0.97 | 1.07 | --- | --- |
| Tetrachloroethane 1,1,2,2[C] | 79-34-5 | 0.18 | 0.17 | 4 | --- | 2,400 |
| Tetrachloroethylene (PCE)[C] | 127-18-4 | 5[M] | 5 | 62 | 5,280 | 840 |
| Tetrahydrofuran | 109-99-9 | 6,300 | --- | --- | --- | --- |
| Toluene[11, 12] | 108-88-3 | 560 to 1,000[M] | 510 | 5,900 | 17,500 | --- |
| Toxaphene[C, 12] | 8001-35-2 | 0.032 to 3[M] | 0.00028 | ---[10] | 0.73 | 0.0002 |
| Tributyltin (TBT) | 56573-85-4 | --- | --- | --- | 0.46 | 0.072 |

| BASIC STANDARDS FOR ORGANIC CHEMICALS (in micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|
| Parameter | | Human Health Based[1] | | | Aquatic Life Based[4] | |
| | CAS No. | Water Supply[2] | Water+Fish[3] | Fish Ingestion[8] | Acute | Chronic |
| Tricholoacetic acid | 76-03-9 | 0.52 | --- | --- | --- | --- |
| Trichlorobenzene 1,2,4-[11] | 120-82-1 | 70[M] | 35 | ---[10] | 250 | 50 |
| Trichloroethane 1,1,1 (1,1,1-TCA) | 71-55-6 | 200[M] | --- | --- | --- | --- |
| Trichloroethane 1,1,2 (1,1,2-TCA)[11, 12] | 79-00-5 | 2.8 to 5[M] | 2.7 | 71 | 9,400 | --- |
| Trichloroethylene (TCE) | 79-01-6 | 5[M] | 2.5 | 30 | 45,000 | 21,900 |
| Trichloropropane 1,2,3- [C, 13] | 96-18-4 | 3.7E-4 | --- | --- | --- | --- |
| Trichlorophenol 2,4,5 | 95-95-4 | 700 | 700 | 3,600 | --- | --- |
| Trichlorophenol 2,4,6[C] | 88-06-2 | 3.2 | 1.4 | 2.4 | --- | 970 |
| Trichlorophenoxypropionic acid (2,4,5-tp) (Silvex) | 93-72-1 | 50[M] | --- | --- | --- | --- |
| Trihalomethanes | (total)[7] | 80 | 80 | --- | --- | --- |
| Vinyl Chloride[C, 12] | 75-01-4 | 0.023 to 2[M] | 0.023 | 2.3 | --- | --- |
| Xylenes (total)[12] | 1330-20-7 | 1,400 to 10,000[M] | --- | --- | --- | --- |

1 All standards are chronic or 30-day standards. They are based on information contained in EPA's Integrated Risk Information System (IRIS) and/or EPA lifetime health advisories for drinking water using a $10^{-6}$ incremental risk factor unless otherwise noted.

2 Only applicable to segments classified for water supply.

3 Applicable to all Class 1 aquatic life segments which also have a water supply classification or Class 2 aquatic life segments which also have a water supply classification designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the water plus fish ingestion criteria to warrant the adoption of water plus fish ingestion standards for the segment in question.

4 Applicable to all aquatic life segments.

5 Deleted

6 Standards are pH dependent. Those listed are calculated for pH = 7.8.

$$\text{Acute} = e^{[1.005(pH)-4.869]};\ \text{Chronic} = e^{[1.005(pH)-5.134]}.$$

7 Total trihalomethanes are considered the sum of the concentrations of bromodichloromethane (CAS No. 75-27-4), dibromochloromethane (Chlorodibromomethane(HM), CAS No. 124-48-1), tribromomethane (bromoform, CAS No. 75-25-2) and trichloromethane (chloroform, CAS No. 67-66-3).

8 Applicable to the following segments which do not have a water supply classification: all Class 1 aquatic life segments or Class 2 aquatic life segments designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the fish ingestion criteria to warrant the adoption of fish ingestion standards for the segment in question.

9 PCBs are a class of chemicals which include aroclors, 1242, 1254, 1221, 1232, 1248,1260 and 1016, CAS numbers 53469-21-9, 11097-69-1, 11104-28-2, 11141-16-5, 12672-29-6, 11096-82-5, and 12674-11-2 respectively. The aquatic life criteria apply to this set of PCBs. The human health criteria apply to total PCBs, i.e. the sum of all congenor or all isomer analyses.

10 The chronic aquatic life standard is more stringent than the associated Water+Fish or Fish Ingestion standard, and therefore no Water+Fish or Fish Ingestion standard has been adopted.

11 The Water+Fish and Fish Ingestions standards for these compounds have been calculated using a relative source contribution (RSC).

12 Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. 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.

13 Mutagenic compound, age dependent factors were used in calculating standard.

C Carcinogens classified by the EPA as A, B1, or B2.

M Drinking water MCL.

CAS No. - Chemical Abstracts Service Registry Number.

(HM) – Halomethanes

(PAH) - Polynuclear Aromatic Hydrocarbons.

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(4) Site-Specific Radioactive Materials and Organic Pollutants Standards.

(a) In determining whether to adopt site-specific standards to apply in lieu of the statewide standards established in sections (2) and (3) above, the Commission shall first determine the appropriate use classifications, in accordance with section 31.13. If such a determination would result in removing an existing classification, the downgrading factors in section 31.6 (2)(B) shall apply.

(b) The Commission shall then determine whether numerical standards other than some or all of the statewide standards established in sections (2) and (3) above would be more appropriate for protection of the classified uses, taking into account the factors prescribed in section 25-8-204(4), C.R.S. and in section 31.7. The downgrading factors described in section 31.6(2)(B) shall not apply to the establishment of site-specific standards under this section.

(c) Site-specific standards to apply in lieu of statewide standards may be based upon consideration of the appropriateness of the assumptions used in the risk assessment based potency factors and reference dose values, including, but not limited to, consideration of the uncertainty factor, exposure assessment, bioaccumulation factor, exposed population factor, assumed consumption factor, risk comparisons, uncertainty analysis, and the availability of the toxics in the water column, considering persistence, hardness, pH, temperature or valence form in the water column.

(5) Nothing in this regulation shall be interpreted to preclude:

(a) An agency responsible for implementation of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et seq., as amended, from selecting a remedial action that is more or less stringent than would be achieved by compliance with the statewide numerical standards established in this section, or alternative site-specific standards adopted by the commission, where a determination is made that such a variation is authorized pursuant to the applicable provisions of CERCLA.

(6) Except where the Commission adopts or has adopted a different standard on a site-specific basis, the less restrictive of the following two options shall apply as numerical standards for all surface waters with a “water supply” classification, if water supply is an actual use of the waters in question or of hydrologically connected ground water:

i. existing quality as of January 1, 2000; or

ii. the following table value criteria set forth in Tables II and III:

| | |
|---|---|
| Iron | 300 ug/l (dissolved) |
| Manganese | 50 ug/l (dissolved) |
| Sulfate | 250 mg/l |

Provided, that if the existing quality of these constituents in such surface waters as of January 1, 2000, is affected by an unauthorized discharge with respect to which the Division has undertaken an enforcement action, the numerical standards shall be the ambient conditions existing prior to the unauthorized discharge or the above table value criteria, whichever is less restrictive.

Data generated subsequent to January 1, 2000 shall be presumed to be representative of existing quality as of January 1, 2000, if the available information indicates that there have been no new or increased sources of these pollutants impacting the segment(s) in question subsequent to that date.

For all surface waters with a “water supply” classification that are not in actual use as a water supply, the water supply table value criteria for sulfate, iron and manganese set forth in Tables II and III may be applied as numerical standards only if the Commission determines as the result of a site-specific rulemaking hearing that such standards are necessary and appropriate in accordance with section 31.7.

(7) Methylmercury Fish Tissue: Fish tissue concentrations shall not exceed 0.3 milligrams methylmercury per kilogram (0.3 mg/kg) of wet-weight fish tissue. Attainment of the standard will be assessed by comparing the average fish tissue methylmercury concentration for each species and size class to the 0.3 mg/kg standard.

## 31.12 SALINITY AND SUSPENDED SOLIDS

The Commission recognizes that excessive salinity and suspended solids levels can be detrimental to the water use classifications. The Commission has established salinity standards for the Colorado River Basin ("Water Quality Standards for Salinity including Numeric Criteria and Plan of Implementation of Salinity Control", Commission Regulation No. 39) but has not established or assigned other standards for salinity or suspended solids control practices to be developed through 208 plans, coordination with agricultural agencies, and further studies of existing water quality.

## 31.13 STATE USE CLASSIFICATIONS

Waters are classified according to the uses for which they are presently suitable or intended to become suitable. In addition to the classifications, one or more of the qualifying designations described in section 31.13(2), may be appended. Classifications may be established for any state surface waters, except that water in ditches and other manmade conveyance structures shall not be classified.

### (1) Classifications

(a) <u>Recreation</u>

(i) Class E Existing Primary Contact Use

These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.

(ii) Class P - Potential Primary Contact Use

These surface waters have the potential to be used for primary contact recreation. This classification shall be assigned to water segments for which no use attainability analysis has been performed demonstrating that a recreation class N classification is appropriate, if a reasonable level of inquiry has failed to identify any existing primary contact uses of the water segment, or where the conclusion of a UAA is that primary contact uses may potentially occur in the segment, but there are no existing primary contact uses.

(iii) Class N - Not Primary Contact Use

These surface waters are not suitable or intended to become suitable for primary contact recreation uses. This classification shall be applied only where a use attainability analysis demonstrates that there is not a reasonable likelihood that primary contact uses will occur in the water segment(s) in question within the next 20-year period.

(v) Class U - Undetermined Use

These are surface waters whose quality is to be protected at the same level as existing primary contact use waters, but for which there has not been a reasonable level of inquiry about existing recreational uses and no recreation use attainability analysis has been completed. This shall be the default classification until inquiry or analysis demonstrates that another classification is appropriate.

(b) Agriculture

These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

(c) Aquatic Life

These surface waters presently support aquatic life uses as described below, or such uses may reasonably be expected in the future due to the suitability of present conditions, or the waters are intended to become suitable for such uses as a goal:

(i) Class I - Cold Water Aquatic Life

These are waters that (1) currently are capable of sustaining a wide variety of cold water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.

(ii) Class 1 - Warm Water Aquatic Life

These are waters that (1) currently are capable of sustaining a wide variety of warm water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of specifies.

(iii) Class 2- Cold and Warm Water Aquatic Life

These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.

(d) Domestic Water Supply

These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

(i) Direct Use Water Supply Lakes and Reservoirs Sub-classification

(A) For the purpose of this section, “plant intake” means the works or structures at the head of a conduit through which surface water is diverted from a source (e.g., lake) into the treatment plant.

(B) Direct Use Water Supply Lakes and Reservoirs (DUWS) are those water supply lakes and reservoirs where:

(I) There is a plant intake located in the lake or reservoir or a man-made conveyance from the lake or reservoir that is used regularly to provide raw water directly to a water treatment plant that treats and disinfects raw water, or

(II) The Commission, based on evidence in the record, determines that the reservoir will meet the criteria in 31.13(1)(d)(i)(B)(I) in the future.

(e) Wetlands

(i) The provisions of this section do not apply to constructed wetlands.

(ii) Compensatory wetlands shall have, as a minimum, the classifications of the segment in which they are located.

(iii) Created wetlands shall be considered to be initially unclassified, and shall be subject only to the narrative standards set forth in section 31.11, unless and until the Commission adopts the “wetlands” classification described below and appropriate numeric standards for such wetlands.

(iv) Tributary wetlands shall be considered tributaries of the surface water segment to which they are most directly connected and shall be subject to interim classifications as follows: such wetlands shall be considered to have the same classifications, except for drinking water supply classifications, as the segment of which they are a part, unless the “wetlands” classification and appropriate site-specific standards have been adopted to protect the water quality dependent functions of the wetlands. Interim numeric standards for these wetlands are described in section 31.7(1)(b)(iv).

(v) The Commission may adopt a “wetlands” classification based on the functions of the wetlands in question. Wetland functions that may warrant site-specific protection include ground water recharge or discharge, flood flow alteration, sediment stabilization, sediment or other pollutant retention, nutrient removal or transformation, biological diversity or uniqueness, wildlife diversity or abundance, aquatic life diversity or abundance, and recreation. Because some wetland functions may be mutually exclusive (e.g., wildlife abundance, recreation), the functions to be protected or restored will be determined on a wetland-by-wetland basis, considering natural wetland characteristics and overall benefits to the watershed. The initial adoption of a site-specific wetlands classification and related standards to replace the interim classifications and standards described above shall not be considered a downgrading.

**(2) Qualifiers**

The following qualifiers may be appended to any classification to indicate special considerations. Where a qualifier applies, it will be appended to the use classification; for example, “Class 1, Warm Water Aquatic Life (Goal)”.

(a) Goal

A qualifier which indicates that the waters are presently not fully suitable but are intended to become fully suitable for the classified use. “Goal” will be used to indicate that a temporary modification for one or more of the underlying numeric standards has been granted.

(b) Seasonal

A qualifier which indicates that the water may only be suitable for a classified use during certain periods of the year. During those periods when water is in the stream, the standards as defined in sections 31.7(1)(b) and 31.9(1) shall apply.

(c) Interrupted Flow

A qualifier which indicates that due to natural or human induced conditions the continuity of flow is broken not necessarily according to a seasonal schedule. This qualifier appended to a classification indicates that the flow conditions still permit the classified use during period of flow. The presence of water diversions in a stream does not change the classifications and standards and the standards do not require that flow be maintained in the stream.

**(3) Areas Requiring Special Protection**

In special cases where protection of beneficial uses requires standards not provided by the classification above, special standards may be assigned after full public notice and hearings. Cases where special protection may be needed include but are not limited to wildlife preserves and waterbodies endangered by eutrophication. In addition, the Commission may adopt site-specific criteria-based standards based on site-specific analyses to protect agriculture, water supply or recreational uses.

## 31.14 RESERVED

## 31.15 SEVERABILITY

The provisions of this regulation are severable, and if any provisions or the application of the provisions to any circumstances is held invalid, the application of such provision to other circumstances and the remainder of this regulation shall not be affected thereby.

## 31.16 TABLES

**(1) INTRODUCTION**

The numeric levels for parameters listed in Tables I, II, III shall be considered and applied as appropriate by the Commission in establishing site-specific numeric standards, in accordance with section 31.7.

For the purposes of integrating these parameters into NPDES discharge permits, the duration of the averaging period for the numeric level is designated in the tables. Chronic levels and 30-day levels are to be averaged as defined in section 31.5(7). Acute levels and 1-day levels are to be averaged as defined in section 31.5(2).

Certain toxic metals for Aquatic Life have different numeric levels for different levels of water hardness. Water hardness is being used here as an indication of differences in the complexing capacity of natural waters and the corresponding variation of metal toxicity. Other factors such as organic and inorganic ligands, pH, and other factors affecting the complexing capacity of the waters may be considered in setting site-specific numeric standards in accordance with section 31.7. Metals listed in Table III for aquatic life uses are stated in the dissolved form unless otherwise indicated.

**(2) TESTING PROCEDURES**

Various testing procedures to determine that numeric values for water quality parameters may be appropriate to present to the Water Quality Control Commission at stream classification hearings. (See section 31.6(3)). These include:

(a) Standard Test Procedures

(i) Code of Federal Regulations, Title 40, Part 136;

(ii) The latest approved EPA Methods for Chemical Analysis of Water and Wastes;

(iii) Standard Methods for the Examination of Water and Wastewater (current edition), American Public Health Association;

(iv) ASTM Standards, Part 31, Water;

(v) EPA Biological Field and Laboratory Methods.

(b) Toxicity testing and Criteria Development Procedures:

(i) The latest EPA Methods for Chemical Analysis of Water and Wastewater; ASTM, Standard Methods for Examination of Water, Wastewater;

(ii) Interim Guidance on Determination and Use of Water-Effect Ratio for Metals, EPA-823-B-94-001, U.S. Environmental Protection Agency, February, 1994.

(iii) Other approved EPA methods.

(c) Other Procedures:

Other procedures may be deemed appropriate by either the Water Quality Control Commission and/or the Water Quality Control Division.

**(3) REFERENCES**

Capital letters following levels in the tables indicate the sources of the level; they are referenced below. In some cases, the source is described in a footnote.

(A) EPA Quality Criteria for Water, July 1976, U.S. Environmental Protection Agency, U.S. Government Printing Office: 1977 0-222-904, Washington, D.C. 256 p.

(B) EPA - Water Quality Criteria 1972, Ecological Research Series, National Academy of Sciences, National Academy of Engineering, EPA-R3-73-033, March 1973, Washington, D.C. 594 p.

(C) Davies, P.H. and Goettl, J.P., Jr., July 1976, Aquatic Life - Water Quality Recommendations for Heavy Metal and Other Inorganics.

(D) Parametrix Inc., Attachment II, Parametrix Reports - Toxicology Assessments of As, Cu, Fe, Mn, Se, and Zn, May 1976, Bellevue, Washington, 98005. submitted to Water Quality Control Commission by Gulf Oil Corp., Inc., 161 p.

(E) EPA National Interim Primary Drinking Water Regulations, 40 Code of Federal Regulations, Part 141.

(F) EPA, March 1977, Proposed National Secondary Drinking Water Regulation, Federal Register, Vol. 42 No. 62, pp 17143-17147.

(G) Recommendations based on review of all available information by the Committee on Water Quality Standards and Stream Classification.

(H) American Fishery Society, June 1978, A Review of the EPA Red Book Quality Criteria for Water, (Preliminary Edition).

(I) Section 307 of the Clean Water Act, regulations promulgated pursuant to Section 307.

(J) Final Report of the Water Quality Standards and Methodologies Committee to the Colorado Water Quality Control Commission, June 1986.

(K) Proposed Nitrogenous Water Quality Standards for the State of Colorado, by the Nitrogen Cycle Committee of the Basic Standards Review Task Force, March 12, 1986 (Final Draft).

(L) Quality Criteria for Water, 1986, and Updates Through 1989, U.S. Environmental Protection Agency, U.S. Government Printing Office, EPA 440/5-86-001, Washington, D.C. 20460.

(M) m superscript: level modified by Commission

(N) 1999 Update of Ambient Water Quality Criteria for Ammonia (1999 Ammonia Update), U.S. Environmental Protection Agency, Office of Water, EPA-823-F-99-024, Washington, D.C. 20460.

(O) Raisbeck, M.F., S. L. Riker, C. M. Tate, R. Jackson, M. A. Smith, K. J. Reddy and J. R. Zygmunt. 2008. Water quality for Wyoming livestock and wildlife. University of Wyoming AES Bulletin B-1183.

**TABLE I - PHYSICAL AND BIOLOGICAL PARAMETERS**

| TABLE I PHYSICAL AND BIOLOGICAL PARAMETERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Recreational | | | Aquatic Life | | | Agriculture | Domestic Water Supply |
| | CLASS E (Existing Primary Contact) and CLASS U (Undetermined Use) | CLASS P (Potential Primary Contact Use) | CLASS N (Not Primary Contact Use) | CLASS 1 COLD WATER BIOTA | CLASS 1 WARM WATER BIOTA | CLASS 2 | | |
| PHYSICAL | | | | | | | | |
| D.O. (mg/l)(1)(9) | 3.0(A) | 3.0(A) | 3.0(A) | 6.0(2)(G) 7.0(spawning) | 5.0(2)(G) | 5.0(A) | 3.0(A) | 3.0(A) |
| pH (Std. Units)(3) | 6.5-9.0 (Bm) | 6.5-9.0 (Bm) | 6.5-9.0 (Bm) | 6.5-9.0(A) | 6.5-9.0(A) | 6.5-9.0(A) | | 5.0-9.0(A) |
| Suspended Solids(4) | | | | | | | | |

| TABLE I PHYSICAL AND BIOLOGICAL PARAMETERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Recreational | | | Aquatic Life | | | Agriculture | Domestic Water Supply |
| | CLASS E (Existing Primary Contact) and CLASS U (Undetermined Use) | CLASS P (Potential Primary Contact Use) | CLASS N (Not Primary Contact Use) | CLASS 1 COLD WATER BIOTA | CLASS 1 WARM WATER BIOTA | CLASS 2 | | |
| Temperature (°C) (5) | | | | **Rivers & Streams:**<br>**Tier I[a,g]:**<br>June-Sept = 17.0 (ch), 21.7 (ac)<br><br>Oct –May = 9.0 (ch), 13.0 (ac)<br><br>**Tier II[b,g]:**<br>Apr-Oct =18.3 (ch), 24.3 (ac)<br><br>Nov-Mar = 9.0 (ch), 13.0 (ac)<br><br>**Lakes & Res[h]:**<br>Apr-Dec = 17.0 (ch), 21.2 (ac)<br><br>Jan-Mar = 9.0 (ch), 13.0 (ac)<br><br>**Large Lakes & Res[c,h]:**<br>Apr-Dec = 18.3 (ch), 24.2 (ac)<br><br>Jan-Mar = 9.0 (ch), 13.0 (ac) | **Rivers & Streams:**<br>**Tier I[d]:**<br>Mar-Nov = 24.2 (ch), 29.0 (ac)<br><br>Dec-Feb = 12.1 (ch), 24.6 (ac)<br><br>**Tier II[e]:**<br>Mar-Nov = 27.5 (ch), 28.6(ac)<br><br>Dec-Feb = 13.8 (ch), 25.2 (ac)<br><br>**Tier III[f]:**<br>Mar-Nov = 28.7 (ch), 31.8 (ac)<br><br>Dec-Feb = 14.3 (ch), 24.9 (ac)<br><br>**Lakes & Res:**<br>Apr-Dec = 26.2 (ch), 29.3 (ac)<br><br>Jan-Mar = 13.1 (ch), 24.1 (ac) | Same as Class 1 | | |
| BIOLOGICAL: | | | | | | | | |
| *E coli* per 100 ml | 126(7) | 205(7) | 630(7) | | | | | 630 |
| Note: Capital letters In parentheses refer to references listed in section 31.16(3); Numbers in parentheses refer to Table 1 footnotes. | | | | | | | | |

Temperature Definitions
[a] Cold Stream Tier I temperature criteria apply where cutthroat trout and brook trout are expected to occur.

| TABLE I PHYSICAL AND BIOLOGICAL PARAMETERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Recreational | | | Aquatic Life | | | Agriculture | Domestic Water Supply |
| | CLASS E (Existing Primary Contact) and CLASS U (Undetermined Use) | CLASS P (Potential Primary Contact Use) | CLASS N (Not Primary Contact Use) | CLASS 1 COLD WATER BIOTA | CLASS 1 WARM WATER BIOTA | CLASS 2 | | |

[b] Cold Stream Tier II temperature criteria apply where cold-water aquatic species, excluding cutthroat trout or brook trout, are expected to occur.
[c] Large Cold Lakes temperature criteria apply to lakes and reservoirs with a surface area equal to or greater than 100 acres surface area.
[d] Warm Stream Tier I temperature criteria apply where common shiner, johnny darter, or orangethroat darter, or stonecat are expected to occur.
[e] Warm Stream Tier II temperature criteria apply where brook stickleback, central stoneroller, creek chub, finescale dace, longnose dace, mountain sucker, Nnorthern redbelly dace, razorback sucker, or white sucker are expected occur, and none of the more thermally sensitive species in Tier I are expected to occur.
[f] Warm Stream Tier III temperature criteria apply where warm-water aquatic species are expected to occur, and none of the more thermally sensitive species in Tiers I and II are expected to occur.
[g] Mountain whitefish-based summer temperature criteria [16.9 (ch), 21.2 (ac)] apply when and where spawning and sensitive early life stages of this species are known to occur.
[h] Lake trout-based summer temperature criteria [16.6 (ch), 22.4 (ac)] apply where appropriate and necessary to protect lake trout from thermal impacts.

**Table I – Footnotes**

(1) Standards for dissolved oxygen are minima, unless specified otherwise. For the purposes of permitting, dissolved oxygen may be modeled for average conditions of temperature and flow for the worst case time period. Where dissolved oxygen levels less than these levels occur naturally, a discharge shall not cause a further reduction in dissolved oxygen in receiving water. (For lakes, also see footnote 9.)

(2) A 7.0 mg/liter standard (minimum), during periods of spawning of cold water fish, shall be set on a case by case basis as defined in the NPDES or CDPS permit for those dischargers whose effluent would affect fish spawning.

(3) The pH standards of 6.5 (or 5.0) and 9.0 are an instantaneous minimum and maximum, respectively to be applied as effluent limits. In determining instream attainment of water quality standards for pH, appropriate averaging periods may be applied, provided that beneficial uses will be fully protected.

(4) Suspended solid levels will be controlled by Effluent Limitation Regulations, Basic Standards, and Best Management Practices (BMPs).

(5) Temperature shall maintain a normal pattern of diel and seasonal fluctuations and spatial diversity with no abrupt changes and shall have no increase in temperature of a magnitude, rate, and duration deleterious to the resident aquatic life. These criteria shall not be interpreted or applied in a manner inconsistent with section 25-8-104, C.R.S.

a. The MWAT of a waterbody shall not exceed the chronic temperature criterion more frequently than one event in three years on average.

b. The DM of a waterbody shall not exceed the acute temperature criterion more frequently than one event in three years on average.

c. The following shall not be considered an exceedance of the criteria:

i. Air temperature excursion: ambient water temperature may exceed the criteria in Table 1 or the applicable site-specific standard when the daily maximum air temperature exceeds the 90th percentile value of the monthly maximum air temperatures calculated using at least 10 years of air temperature data.

ii. Low-flow excursion: ambient water temperature may exceed the criteria in Table 1 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)

iii. 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.

(6) Deleted

(7) *E.coli* criteria and resulting standards for individual water segments, are established as indicators of the potential presence of pathogenic organisms. Standards for *E. coli* are expressed as a two-month geometric mean. Site-specific or seasonal standards are also two-month geometric means unless otherwise specified.

(8) Deleted

(9) The dissolved oxygen standard applies to lakes and reservoirs as follows.

a. Recreation: In the upper portion of a lake or reservoir, dissolved oxygen shall not be less than the criteria in Table 1 or the applicable site-specific standard. In the lower portion of a lake or reservoir, dissolved oxygen may be less than the applicable standard except where a site-specific standard has been adopted. A site-specific dissolved oxygen standard will be established for the lower portion of a lake or reservoir where there is evidence that primary contact occurs within the lower portion.

b. Agriculture: In the upper portion of a lake or reservoir, dissolved oxygen shall not be less than the criteria in Table 1 or the applicable site-specific standard. In the lower portion of a lake or reservoir, dissolved oxygen may be less than the applicable standard except where a site-specific standard has been adopted. A site-specific dissolved oxygen standard will be established for the lower portion of a lake or reservoir where there is evidence that livestock watering or irrigation water is pumped from the lower portion.

c. Aquatic Life: In the upper portion of a lake or reservoir, dissolved oxygen shall not be less than the criteria in Table I or the applicable site-specific standard. In the lower portion of a lake or reservoir, dissolved oxygen may be less than the applicable standard as long as there is adequate refuge. Adequate refuge means that there is concurrent attainment of the applicable Table I temperature and dissolved oxygen criteria. A site-specific dissolved oxygen standard will be established for the lower portion of a lake or reservoir where the expected aquatic community has habitat requirements within the lower portion.

i. Fall turnover exclusion: Dissolved oxygen may drop 1 mg/l below the criteria in Table 1 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 or reservoir 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.

d. Water Supply: The dissolved oxygen criteria is intended to apply to the epilmnion and metalimnion strata of lakes and reservoirs. Dissolved oxygen in the hypolimnion may, due to the natural conditions, be less than the table criteria. No reductions in dissolved oxygen levels due to controllable sources is allowed

**TABLE II - INORGANIC PARAMETERS**

| TABLE II INORGANIC PARAMETERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PARAMETER | AQUATIC LIFE | | | | | | AGRICULTURE | DOMESTIC WATER SUPPLY |
| | CLASS 1 Cold Water Biota | | CLASS 1 Warm Water Biota | | CLASS 2 | | | |
| INORGANICS: | | | | | | | | |
| Ammonia (mg/l as N) Total | chronic = elsp or elsa (1) acute = sp (1) (N) | | chronic = Apr 1-Aug 31=elsp(1) Sept 1-Mar 29=elsa(1) acute = sa(1) (N) | | Class 2 Cold/Warm have the same standards as Class 1 Cold/Warm (N) | | | |
| Total residual Chlorine (mg/l) | 0.019 (L) (1-day) | 0.011 (L) (30-day) | 0.019 (L) (1-day) | 0.011 (L) (30-day) | 0.019 (L) (1-day) | 0.011 (L) (30-day) | | |
| Cyanide - Free (mg/l) | 0.005(H) (1-day) | | 0.005(H) (1-day) | | 0.005(H) (1-day) | | 0.2(G) (1-day) | 0.2(B,D[m]) (1-day) |
| Fluoride (mg/l) | | | | | | | | 2.0(3)(E) (1-day) |
| Nitrate (mg/l as N) | | | | | | | 100(2)(B) | 10(4)(K) (1-day) |
| Nitrite (mg/l as N) | TO BE ESTABLISHED ON A CASE BY CASE BASIS (3) | | | | A CASE BY CASE BASIS (3) | | 10(2)(B) (1-day) | 1.0(2)(4)(K) (1-day) |
| Sulfide as $H_2S$ (mg/l) | 0.002 undissociated(A) (30-day) | | 0.002 undissociated(A) (30-day) | | 0.002 undissociated(A) (30-day) | | | 0.05(F) (30-day) |
| Boron (mg/l) | | | | | | | 0.75(A,B) (30-day) | |
| Chloride (mg/l) | | | | | | | | 250(F) (30-day) |
| Sulfate (mg/l) | | | | | | | | 250(F) (30-day) |
| Asbestos | | | | | | | | 7,000,000 fibers/L(5) |
| NOTE: Capital letters in parentheses refer to references listed 31.16(3); numbers in parentheses refer to table II footnotes. | | | | | | | | |

**Table II – Footnotes**

(1)

Chronic:

For Fish Early Life Stage Present (elsp):

$$chronic\ elsp = \left( \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * MIN\left(2.85, 1.45*10^{0.028(25-T)}\right)$$

For Fish Early Life Stage Absent (elsa):

$$chronic\ elsa = \left( \frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * 1.45*10^{0.028*(25-MAX(T,7))}$$

Acute:

For salmonids present (sp):

$$acute\ sp = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$$

For salmonids absent (sa):

$$acute\ sa = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

(2) In order to provide a reasonable margin of safety to allow for unusual situations such as extremely high water ingestion or nitrite formation in slurries, the $NO_3$-N plus $NO_2$-N content in drinking waters for livestock and poultry should be limited to 100ppm or less, and the NO2-N content alone be limited to 10ppm or less.

(3) Salmonids and other sensitive fish species present:

Acute= 0.10 (0.59 * [Cl- ]+3.90) mg/l NO2-N

Chronic= 0.10 (0.29 * [Cl- ]+0.53) mg/l NO2-N

(upper limit for Cl- =40 mg/l)

Salmonids and other sensitive fish species absent:

Acute= 0.20 (2.00 * [Cl- ]+0.73) mg/l NO2-N

Chronic=0.10 (2.00 *[Cl- ]+0.73) mg/l NO2-N

[Cl- ] = Chloride ion concentration

(upper limit for Cl- =22 mg/l)

(4) The nitrate limit shall be calculated to meet the relevant standard in accordance with the provisions of Section 31.10 of this regulation, unless (this subsection 4 is repealed effective 12/31/2022):

a. The permittee provides documentation that a reasonable level of inquiry demonstrates that there is no actual domestic water supply use of the waters in question or of hydrologically connected ground water, or

b. The combined total of nitrate plus nitrite at the point of intake to the domestic water supply will not exceed 10 mg/l as demonstrated through modeling or other scientifically supportable analysis

(5) Asbestos standard applies to fibers 10 micrometers or longer.

**TABLE III - METAL PARAMETERS**

| TABLE III METAL PARAMETERS (Concentration in µg/l) | | | | | | |
|---|---|---|---|---|---|---|
| METAL[1] | AQUATIC LIFE[1][3][4][J] | | AGRICULTURE[2] | DOMESTIC WATER-SUPPLY[2] | WATER + FISH[7] | FISH INGESTION[10] |
| | ACUTE | CHRONIC | | | | |
| Aluminum | $e^{(1.3695[\ln(hardness)]+1.8308)}$ (tot.rec.) | 87 or $e^{(1.3695[\ln(hardness)]-0.1158}$ (tot.rec.)[11] | | | --- | --- |
| Antimony | | | | 6.0 (30-day) | 5.6 | 640 |
| Arsenic | 340 | 150 | 100[A] (30-day) | 0.02 – 10[13] (30-day) | 0.02 | 7.6 |
| Barium | | | | 1,000[E](1-day) 490 (30-day) | --- | --- |
| Beryllium | | | 100[A,B] (30-day) | 4.0 (30-day) | --- | --- |
| Cadmium | $(1.136672-[\ln(hardness) \times (0.041838)])\times e^{0.9151[\ln(hardness)]-3.1485}$ (Trout)=$(1.136672-[\ln(hardness)\times (0.041838)])\times e^{0.9151[\ln(hardness)]-3.6236}$ | $(1.101672-[\ln(hardness) \times (0.041838)] \times e^{0.7998[\ln(hardness)]-4.4451}$ | 10[B] (30-day) | 5.0[E] (1-day) | --- | --- |
| Chromium III[5] | $e^{(0.819[\ln(hardness)]+2.5736)}$ | $e^{(0.819[\ln(hardness)]+0.5340)}$ | 100[B] (30-day) | 50[E] (1-day) | --- | --- |
| Chromium VI[5] | 16 | 11 | 100[B] (30-day) | 50[E] (1-day) | 100(30-day) | --- |
| Copper | $e^{(0.9422[\ln(hardness)]-1.7408)}$ | $e^{(0.8545[\ln(hardness)]-1.7428)}$ | 200[B] | 1,000[F] (30-day) | 1,300 | --- |
| Iron | | 1,000(tot.rec.)[A,C] | | 300(dis)[F] (30-day) | --- | --- |
| Lead | $(1.46203-[(\ln(hardness)*(0.145712)])*e^{(1.273[\ln(hardness)]-1.46)}$ | $(1.46203-[(\ln(hardness)*(0.145712)])*e^{(1.273[\ln(hardness)]-4.705)}$ | 100[B] (30-day) | 50[E] (1-day) | — | --- |
| Manganese | $e^{(0.3331[\ln(hardness)]+6.4676)}$ | $e^{(0.3331[\ln(hardness)]+5.8743)}$ | 200[B] (30-day)[12] | 50(dis)[F] (30-day) | — | --- |
| Mercury | | FRV(fish)[6] = 0.01 (Total) | | 2.0[E] (1-day) | — | --- |
| Molybdenum | | | 300[O] (30-day)[15] | 210 (30-day) | | |
| Nickel | $e^{(0.846[\ln(hardness)]+2.253)}$ | $e^{(0.846[\ln(hardness)]+0.0554)}$ | 200[B] (30-day) | 100[E] (30-day) | 610 | 4,600 |

| TABLE III METAL PARAMETERS (Concentration in µg/l) | | | | | | |
|---|---|---|---|---|---|---|
| METAL[1] | AQUATIC LIFE[1][3][4][J] | | AGRICULTURE[2] | DOMESTIC WATER-SUPPLY[2] | WATER + FISH[7] | FISH INGESTION[10] |
| | ACUTE | CHRONIC | | | | |
| Selenium[9] | 18.4 | 4.6 | 20[B,D] (30-day) | 50[E] (30-day) | 170 | 4,200 |
| Silver | ½$e^{(1.72[\ln(hardness)]-6.52)}$ | $e^{(1.72[\ln(hardness)]-9.06)}$ (Trout) = $e^{(1.72[\ln(hardness)]-10.51)}$ | | 100[F] (1-day) | — | --- |
| Thallium | | 15[C] | | 0.5 (30-day) | 0.24 | 0.47 |
| Uranium[16] | $e^{(1.1021[\ln(hardness)]+2.7088)}$ | $e^{(1.1021[\ln(hardness)]+2.2382)}$ | | 16.8 – 30[13] (30-day) | --- | --- |
| Zinc | $0.978*e^{(0.9094[\ln(hardness)]+0.9095)}$ | $0.986*e^{(0.9094[\ln(hardness)]+0.6235)}$ (sculpin)[14] = $e^{(2.140[\ln(hardness)]-5.084)}$ | 2000[B] (30-day) | 5,000[F] (30-day) | 7,400 | 26,000 |
| NOTE: Capital letters in parentheses refer to references listed in section 31.16(3); Numbers in parentheses refer to Table III footnote | | | | | | |

**Table III – Footnotes**

(1) Metals for aquatic life use are stated as dissolved unless otherwise specified.

Where the hardness-based equations in Table III are applied as table value water quality standards for individual water segments, those equations define the applicable numerical standards. As an aid to persons using this regulation, Table IV provides illustrative examples of approximate metals values associated with a range of hardness levels. This table is provided for informational purposes only.

(2) Metals for agricultural and domestic uses are stated as total recoverable unless otherwise specified.

(3) Hardness values to be used in equations are in mg/l as calcium carbonate and shall be no greater than 400 mg/l. The exception is for aluminum, where the upper cap on calculations is a hardness of 220 mg/l. For permit effluent limit calculations, the hardness values used in calculating the appropriate metal standard should be based on the lower 95 percent confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site specific data. Where insufficient site specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not possible, a site specific method should be used, e.g., where hardness data exists without paired flow data, the mean of the hardness during the low flow season established in the permit shall be used. In calculating a hardness value, regression analyses should not be extrapolated past the point that data exist. For determination of standards attainment, where paired metal/hardness data is available, attainment will be determined for individual sampling events. Where paired data is not available, the mean hardness will be used.

(4) Both acute and chronic numbers adopted as stream standards are levels not to be exceeded more than once every three years on the average.

(5) Unless the stability of the chromium valence state in receiving waters can be clearly demonstrated, the standard for chromium should be in terms of chromium VI. In no case can the sum of the instream levels of hexavalent and trivalent chromium exceed the water supply standard of 50 µg/l chromium in those waters classified for domestic water use.

(6) FRV means Final Residue Value and should be expressed as “Total” because many forms of mercury are readily converted to toxic forms under natural conditions. The FRV value of 0.01 µg/liter is the maximum allowed concentration of total mercury in the water. This value is estimated to prevent bioaccumulation of methylmercury in edible fish or shellfish tissue above the fish tissue standard for methylmercury of 0.3 mg/kg.

In waters supporting populations of fish or shellfish with a potential for human consumption, the Commission can adopt the FRV as the stream standard to be applied as a 30 day average. Alternatively, the Commission can adopt site specific ambient based standards for mercury in accordance with section 31.7(1)(b)(ii) and (iii). Site-specific water-column standards shall be calculated from the site-specific bioaccumulation factor, using measured water column concentrations of total mercury and measured fish tissue concentrations of methylmercury. Fish tissue data shall be collected from species of the highest trophic level present in the water body. Fish tissue samples should include older, larger individuals present in the water body. A bioaccumulation factor should be calculated separately for each species sampled, and the highest bioaccumulation factor should be used to calculate the site-specific water column standard in order to prevent the average fish tissue concentrations from exceeding 0.3 mg/kg for all species.

(7) Applicable to all Class 1 aquatic life segments which also have a water supply classification or Class 2 aquatic life segments which also have a water supply classification designated by the Commission after rulemaking hearing. These Class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the water plus fish ingestion criteria to warrant the adoption of water plus fish ingestion standards for the segment in question.

(8) The use of 0.1 micron pore size filtration for determining dissolved iron is allowed as an option in assessing compliance with the drinking water standard.

(9) Selenium is a bioaccumulative metal and subject to a range of toxicity values depending upon numerous site-specific variables.

(10) Applicable to the following segments which do not have a water supply classification: all Class 1 aquatic life segments or Class 2 aquatic life segments designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the fish ingestion criteria to warrant the adoption of fish ingestion standards for the segment in question.

(11) Where the pH is equal to or greater than 7.0 in the receiving water after mixing, the chronic hardness-dependent equation will apply. Where pH is less than 7.0 in the receiving water after mixing, either the 87 µg/l chronic total recoverable aluminum criterion or the criterion resulting from the chronic hardness-dependent equation will apply, whichever is more stringent.

(12) This standard is only appropriate where irrigation water is applied to soils with pH values lower than 6.0.

(13) Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. 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.

(14) The chronic zinc equation for sculpin applies in areas where mottled sculpin are expected to occur and hardness is less than 102 ppm CaCO3. The regular chronic zinc equation applies in areas where mottled sculpin are expected to occur, but the hardness is greater than 102 ppm CaCO3.

(15) In determining whether adoption of a molybdenum standard is appropriate for a segment, the Commission will consider whether livestock or irrigated forage is present or expected to be present. The table value assumes that copper and molybdenum concentrations in forage are 7 mg/kg and 0.5 mg/kg respectively, forage intake is 6.8 kg/day, copper concentration in water is 0.008 mg/l, water intake is 54.6 l/day, copper supplementation is 48 mg/day, and that a Cu:Mo ratio of 4:1 is appropriate with a 0.075 mg/l molybdenum margin of safety. Numeric standards different than the table-value may be adopted on a site-specific basis where appropriate justification is presented to the Commission. In evaluating site-specific standards, the relevant factors that should be considered include the presence of livestock or irrigated forage, and the total intake of copper, molybdenum, and sulfur from all sources (i.e., food, water, and dietary supplements). In general, site-specific standards should be based on achieving a safe copper:molybdenum total exposure ratio, with due consideration given to the sulfur exposure. A higher Cu:Mo ratio may be necessary where livestock exposure to sulfur is also high. Species specific information shall be considered where cattle are not the most sensitive species.

(16) When applying the table value standards for uranium to individual segments, the Commission shall consider the need to maintain radioactive materials at the lowest practical level as required by Section 31.11(2) of the Basic Standards regulation.

**TABLE IV - TABLE VALUE STANDARDS FOR SELECTED HARDNESSES**

Table IV
Table Value Standards for Selected Hardnesses
(concentration in ug/L, dissolved)

| | | Mean Hardness in mg/L calcium carbonate | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 25 | 50 | 75 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
| Aluminum | Acute | 512 | 1324 | 2307 | 3421 | 5960 | 8838 | 10071 | 10071 | 10071 | 10071 |
| | Chronic | 73 | 189 | 329 | 488 | 851 | 1262 | 1438 | 1438 | 1438 | 1438 |
| Cadmium | Acute trout | 0.5 | 0.9 | 1.3 | 1.7 | 2.4 | 3.1 | 3.8 | 4.4 | 5.1 | 5.7 |
| | Acute | 0.8 | 1.5 | 2.1 | 2.7 | 3.9 | 5.0 | 6.1 | 7.1 | 8.1 | 9.2 |
| | Chronic | .15 | .25 | 0.34 | 0.42 | 0.58 | 0.72 | 0.85 | 0.97 | 1.1 | 1.2 |
| Chromium III | Acute | 183 | 323 | 450 | 570 | 794 | 1005 | 1207 | 1401 | 1590 | 1773 |
| | Chronic | 24 | 42 | 59 | 74 | 103 | 131 | 157 | 182 | 207 | 231 |
| Copper | Acute | 3.6 | 7.0 | 10 | 13 | 20 | 26 | 32 | 38 | 44 | 50 |
| | Chronic | 2.7 | 5.0 | 7.0 | 9.0 | 13 | 16 | 20 | 23 | 26 | 29 |
| Lead | Acute | 14 | 30 | 47 | 65 | 100 | 136 | 172 | 209 | 245 | 281 |
| | Chronic | 0.5 | 1.2 | 1.8 | 2.5 | 3.9 | 5.3 | 6.7 | 8.1 | 9.5 | 11 |
| Manganese | Acute | 1881 | 2370 | 2713 | 2986 | 3417 | 3761 | 4051 | 4305 | 4532 | 4738 |
| | Chronic | 1040 | 1310 | 1499 | 1650 | 1888 | 2078 | 2238 | 2379 | 2504 | 2618 |
| Nickel | Acute | 145 | 260 | 367 | 468 | 660 | 842 | 1017 | 1186 | 1351 | 1513 |
| | Chronic | 16 | 29 | 41 | 52 | 72 | 94 | 113 | 132 | 150 | 168 |
| Silver | Acute | 0.19 | 0.62 | 1.2 | 2.0 | 4.1 | 6.7 | 9.8 | 13 | 18 | 22 |
| | Chronic Trout | 0.01 | 0.02 | 0.05 | 0.08 | 0.15 | 0.25 | 0.36 | 0.50 | 0.65 | 0.81 |
| | Chronic | 0.03 | 0.10 | 0.20 | 0.32 | 0.64 | 1.0 | 1.6 | 2.1 | 2.8 | 3.5 |
| Uranium | Acute | 521 | 1119 | 1750 | 2402 | 3756 | 5157 | 6595 | 8062 | 9555 | 11070 |
| | Chronic | 326 | 699 | 1093 | 1501 | 2346 | 3221 | 4119 | 5036 | 5968 | 6915 |
| Zinc | Acute | 45 | 85 | 123 | 160 | 231 | 301 | 368 | 435 | 500 | 565 |
| | Chronic sculpin | 6.1 | 27 | 64 | 118 | N/A | N/A | N/A | N/A | N/A | N/A |
| | Chronic | 34 | 65 | 93 | 121 | 175 | 228 | 279 | 329 | 379 | 428 |

Shaded values exceed drinking water supply standards.

## APPENDIX A. Calculation of a Biologically-Based Low Flow

The biologically-based flow calculation method is an iterative convergence procedure consisting of five parts. In Part I, Z (the allowed number of excursions) is calculated. In Part II, the set of X-day running averages is calculated from the daily flows for the period of record being considered. Because the ambient (instream) concentration of a pollutant can be considered to be inversely proportional to stream flow, the appropriate “running averages” of stream flow are actually “running harmonic means.” (The harmonic mean of a set of numbers is the reciprocal of the arithmetic mean of the reciprocals of the numbers.) Thus, “X-day running averages” should be calculated as , not as , where F is the flow for an individual day. Throughout this Appendix A, the term “running average” will mean “running harmonic mean.”

Part III describes the calculation of N (the total number of excursions of a specified flow for the period of record being considered). The calculations described in Part III will be performed for a number of different flows that are specified in Parts IV and V. In Part IV, initial lower and upper limits on the flow are calculated, the number of excursions at each limit are calculated using Part III, and an initial trial flow is calculated by interpolation between the lower and upper limits. In Part V, successive iterations are performed to calculate the flow as the highest flow that results in no more than the number of allowed excursions calculated in Part I.

Part I. Calculation of allowed number of excursions.

I-1. Calculate Z = D/[(Y)(365.25 days/year])

where D = the number of days in the flow record;

Y = the average number of years specified in

the frequency; and

Z = the allowed number of excursions based on a 1-in-3-year recurrence interval.

Part II. Calculation of X-day running averages, i.e., X-day running harmonic means.

II-1. Where X = the specified duration (in days) of the averaging period, calculate the set of X-day running averages for the entire period of record being considered, i.e., calculate an X-day average starting with day 1, day 2, day 3, etc. Each average will have X-1 days in common with the next average, and the number of X-day averages calculated from the period of record being considered will be (D+1-X).

Part III. Determination of the number of excursions of a specified flow in a set of running averages, i.e., running harmonic means.

III-1. Select a specified trial low flow by method outlined in Part IV or an equivalent method.

III-2. In the set of X-day running averages for the period of record being considered, record the date for which the first average is below the specified trial low flow and record the number of consecutive days that are part of at least one or more of the X-day averages that are below the specified flow. (Note that whether a day is counted as an excursion day does not depend exclusively on whether the X-day average for that day is below the specified trial low flow. Instead, it depends entirely on whether that day is part of any X-day average that is below the specified trial low flow. Table A-1 provides examples of the counting of excursion days. For ease in discussion, it is based on a 4-day flow period, rather than a 30-day flow period. When calculating a low flow pursuant to Section 31.9(1), a 30-day period should be used.)

Thus the starting date and the duration (in days) of the first excursion period will be recorded. By definition, the minimum duration is X days.

III-3. Determine the starting dates of, and number of days in, each succeeding excursion period in the period of record being considered.

III-4. Identify all of the excursion periods that begin within 120 days after the beginning of the first excursion period. (Although the first excursion period is often the only one in the 120-day period, two or three sometimes occur within the 120 days. Rarely do any excursion periods occur during days 121 to 240.) All of these excursion periods are considered to be in the first low flow period. Add up the total number of excursion days in the first low flow period and divide the sum by X to obtain the number of excursions in the first low flow period. If the number of excursions is calculated to be greater than 5.0, set it equal to 5.0.

III-5. Identify the first excursion period that begins after the end of the first low flow period, and start the beginning of the second 120-day low flow period on the first day of this excursion period. Determine the number of excursion days and excursions in the second low flow period.

III-6. Determine the starting dates of, and the number of excursions in, each succeeding 120-day low flow period.

III-7. Sum the number of excursions in all the low-flow periods to determine S = the total number of excursions of the specified trial low flow.

Part IV. Calculation of initial limits of the low flow and initial trial flow.

IV-1. Use L = 0 as the initial lower limit.

IV-2. Use U = the XQY low flow as the initial upper limit.

IV-3. Use N L = 0 as the number of excursions (see Part III) of the initial lower limit.

IV-4. Calculate N U = the number of excursions (see Part III) of the initial upper limit.

IV-5. Calculate T = the initial trial flow as

$$T = L + \frac{(Z - N_L)(U - L)}{(N_U - N_L)}$$

IV-6. Calculation of initial limits of the low flow and initial trial flow may be accomplished using equivalent methods.

Part V. Iterative convergence to the low flow.

V-1. Calculate N T = the number of excursions for the trial low flow.

If $-0.005 < (N_T - Z)/Z) < +0.005$

If $N_T > Z$, set $U = T$ and $N_U = N_T$.

V-2 If $N_T < Z$, set $L = T$ and $N_L = N_T$. , use T as the low flow and stop.

V-3. If ((U-L)/U) < 0.005, use L as the low flow and stop.

Otherwise, calculate a new trial flow as $T = L + \frac{(Z - N_L)(U - L)}{(N_U - N_L)}$ and repeat steps V-1, V-2, and V-3 as necessary.

Table A-1. Counting excursion days for a specified flow of 100 ft3/sec using 4-day averages.

| Date | Daily flow | 4-day avg. flow | Is the 4-day average below 100? | Is this date part of any 4-day average that is below 100? | Date of start of excursion period | Number of days in excursion period | Date of start of low flow period | Number of excursion days in low flow period | Number or excursions in low flow period |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 130 | 112.5 | No | No | | | | | |
| 2 | 120 | 102.5 | No | No | | | | | |
| 3 | 110 | 97.5 | Yes | Yes | 3 | 4 | 3 | 12 | 3 |
| 4 | 90 | 102.5 | No | Yes | | | | | |
| 5 | 90 | 117.5 | No | Yes | | | | | |
| 6 | 100 | 112.5 | No | Yes | | | | | |
| 7 | 130 | 102.5 | No | No | | | | | |
| 8 | 150 | 102.5 | No | No | | | | | |
| 9 | 70 | 87.5 | Yes | Yes | 9 | 8 | | | |
| 10 | 60 | 90.0 | Yes | Yes | | | | | |
| 11 | 130 | 102.5 | No | Yes | | | | | |
| 12 | 90 | 95.0 | Yes | Yes | | | | | |
| 13 | 80 | 97.5 | Yes | Yes | | | | | |
| 14 | 110 | 127.5 | No | Yes | | | | | |
| 15 | 100 | 225.0 | No | Yes | | | | | |
| 16 | 100 | >100 | No | Yes | | | | | |
| 17 | 200 | >100 | No | No | | | | | |
| 18 | 500 | >100 | No | No | | | | | |

The daily flows and four-day average flows for days 19 to 200 are all above 100 $ft^3$/sec.

## 31.17 NUTRIENTS

(a) Overview

This section establishes interim numeric values for phosphorus, nitrogen and chlorophyll *a* and also sets forth provisions regarding the use of these numeric values for the adoption of water quality standards.

(b) Interim Phosphorus Values

| Table 1 Interim Total Phosphorus Values | |
|---|---|
| Lakes and Reservoirs, cold, > 25 acres | 25 ug/L [1] |
| Lakes and Reservoirs, warm > 25 acres | 83 ug/L [1] |
| Lakes and Reservoirs, < = 25 acres | RESERVED |
| Rivers and Streams - cold | 110 ug/L [2] |
| Rivers and Streams - warm | 170 ug/L [2] |
| [1] summer (July 1-September 30) average Total Phosphorus (ug/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years.<br>[2] annual median Total Phosphorus (ug/L), allowable exceedance frequency 1-in-5 years. | |

(c) Interim Nitrogen Values (Effective December 31, 2027)

| Table 2 Interim Total Nitrogen Values | |
|---|---|
| Lakes and Reservoirs, cold, > 25 acres | 426 ug/L [1] |
| Lakes and Reservoirs, warm, > 25 acres | 910 ug/L [1] |
| Lakes and Reservoirs, < = 25 acres | RESERVED |
| Rivers and Streams - cold | 1,250 ug/L [2] |
| Rivers and Streams - warm | 2,010 ug/L [2] |
| [1] summer (July 1–September 30) average Total Nitrogen (ug/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years.<br>[2] annual median Total Nitrogen (ug/L), allowable exceedance frequency 1-in-5 years. | |

(d) Interim Chlorophyll *a* Values

| Table 3 Interim Chlorophyll *a* Values | | |
|---|---|---|
| Waterbody type | . | DUWS |
| Lakes and Reservoirs, cold, > 25 acres | 8 ug/L [a] | 5 ug/L [c] |
| Lakes and Reservoirs, warm, > 25 acres | 20 ug/L [a] | 5 ug/L [c] |
| Lakes and Reservoirs, < = 25 acres | RESERVED | 5 ug/L [c] |
| Rivers and Streams - cold | 150 mg/m2 [b] | |
| Rivers and Streams - warm | 150 mg/m2 [b] | |
| [a] summer (July 1- September 30) average chlorophyll a (ug/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years.<br>[b] summer (July 1-September 30) maximum attached algae, not to exceed.<br>[c] March 1-November 30 average chlorophyll a (ug/L) in the mixed layer of lakes (median of multiple depths), allowable exceedance frequency 1-in-5 years. | | |

(e) Use of Interim Phosphorus Values for Standards Adoption

Prior to December 31, 2027 the values set forth in subsection (b) above will be considered for the adoption of water quality standards for specific water bodies in Colorado in the following circumstances.

(i) Waters located upstream of

(A) all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012 or with preliminary effluent limits requested prior to May 31, 2012,

(B) cooling tower discharges, and

(C) any non-domestic facility subject to Regulation #85 effluent limits and discharging prior to May 31, 2012.

(ii) Circumstances where the commission has determined that adoption of numerical standards is necessary to address existing or potential nutrient pollution because the provisions of Regulation #85 will not result in adequate control of such pollution.

(f) Chlorophyll *a* Values for Standards Adoption

Prior to December 31, 2022, the values set forth in subsection (d) above will be considered for the adoption of water quality standards for specific water bodies in Colorado in the following circumstances.

(i) Waters located upstream of

(A) all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012, or with preliminary effluent limits requested prior to May 31, 2012,

(B) cooling tower discharges, and

(C) any non-domestic facility subject to Regulation #85 effluent limits and discharging prior to May 31, 2012.

(ii) Discretionary Application of the Values for Direct Use Water Supply (DUWS) Lakes and Reservoirs. The commission may determine that a numerical chlorophyll standard is appropriate for specific water bodies with this sub-classification after consideration of the following factors:

(A) Whether the public water system using the lake or reservoir as a raw water supply experiences impacts attributed to algae on an intermittent or continual basis;

(B) Whether there are lake or reservoir use restrictions in place that recognize the importance of the reservoir as a water supply;

(C) Whether application of this value appropriately balances protection of all classified uses of the lake or reservoir;

(D) Other site specific considerations which affect the need for a more protective value.

(iii) Circumstances where the commission has determined that adoption of numerical standards is necessary to address existing or potential nutrient pollution because the provisions of Regulation #85 will not result in adequate control of such pollution.

(g) Use of Interim Nitrogen Values for Standards Adoption

After December 31, 2027, the values set forth in subsection (c) above will be considered for the adoption of water quality standards for specific water bodies in Colorado in the circumstances identified in subsection (e)(i) and (ii) above.

(h) Phase 2 Application of Numeric Standards

After December 31, 2022, the values set forth in subsection (d) will be considered by the comission when applying numeric standards to individual segments. After December 31, 2022, the values set forth in subsections (b) and (c) for lakes and reservoirs will be considered by the commission when applying numeric standards to Direct Use Water Supply (DUWS) reservoirs and lakes or lakes and reservoirs with public swim beaches that meet the definition of natural swimming areas in C.R.S. § 25-5-801. After December 31, 2027, the values set forth in subsection (b) and (c) will be considered by the commission when applying numeric standards to individual segments where total phosphorus and total nitrogen standards have not yet been adopted.

For each individual segment where numeric standards for total phosphorus, total nitrogen, and chlorophyll *a* have not yet been adopted, numeric standards will be adopted by the commission where necessary to:

(i) protect the assigned use classifications, and

(ii) comply with the Colorado Water Quality Control Act and the Federal Act.

(i) Site-Specific Flexibility to Consider Alternatives to the Interim Values

In accordance with the preceding subsection, both before and after December 31, 2027, in considering adoption of numeric standards for specific water bodies in Colorado, the commission may review relevant site-specific factors and conditions in determining what numeric standards are most appropriate, and may adopt standards, either more or less stringent than the 31.17(b)(c) and (d) interim values.

(i) Where evidence demonstrates that an alternative numeric standard would be more appropriate for the protection of use classifications, the commission may consider assigning ambient quality-based standards or site-specific criteria based standards as outlined in 31.7(1)(b)(ii-iii).

(ii) Where it has been demonstrated that interim values are not feasible to achieve, the commission may consider modifying the use classification as outlined in Section 31.6(2).

(iii) Where the conditions established in Section 31.7(3)(a) are met, the commission may consider granting a temporary modification.

**31.18 RESERVED.**

**31.19 RESERVED.**

**31.20 STATEMENT OF BASIS AND PURPOSE (1979 ADOPTION)**

These Regulations establish Basic Standards and an Antidegradation Standard (Section 3.1.11 and Section 3.1.8). They also establish a system for classifying State waters, for assigning standards and for granting temporary modifications. These Regulations do not classify State waters, nor do they assign any numeric standards except those radiological standards listed under Basic Standards. In addition, one of these Regulations is a control regulation. Section 3.1.4 makes it a violation to release pollutants into State waters without the treatment or other corrective action necessary to protect the beneficial uses of the waters, or to conduct, operate, or maintain facilities, processes, activities, or waste piles in such a way as to have any adverse effect on the beneficial or classified uses. This section gives the Colorado Water Quality Control Division greater flexibility to protect and maintain the quality of State waters. It is based on C.R.S. 1973, 25-8-102, 25-8-202(1), and 25-8-207(c).

The Colorado Water Quality Control Act requires the Commission to classify waters of the State. These regulations are intended to comply with the legislative intent as stated in C.R.S. 1973, 25-8-102(2):

> "It is further declared to be the public policy of this state to conserve state waters and to protect, maintain, and improve the quality thereof for public water supplies, for protection and propagation of wildlife and aquatic life, and for domestic, agricultural, industrial, recreational, and other beneficial uses; to provide that no pollutant be released into any state waters without first receiving the treatment or other corrective action necessary to protect the legitimate and beneficial uses of such waters; to provide for the prevention, abatement, and control of new or existing water pollution; and to cooperate with other states and the federal government in carrying out these objectives."

In addition, the subject Regulations are consistent with the Federal Clean Water Act which states, in part: (Section 101(a))

> "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters…
>
> (1) it is the national goal that discharge of pollutants into the navigable waters be eliminated by 1985;
>
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;"

C.R.S. 1973, 25-8-203(2) provides that the types of water classes shall be based on or intended to indicate relevant characteristics such as:

(c) Present uses of the water, the uses for which the water is suitable in its present conditions, or the uses for which it is to become suitable as a goal" and

(e) The need to protect the quality of the water for human purposes and also for the protection and propagation of wildlife and aquatic life;"

Such regulations are known as Classifications. C.R.S. 1973, 25-8-204 also requires that the Commission shall promulgate regulations which describe water characteristics or the levels of protection necessary to protect the beneficial uses. Such regulations are referred to as Standards.

In formulating the Regulations governing stream classifications, the Commission relied upon portions of the January 1974 Water Quality Standards and Stream Classifications, on the work of a broadly-based scientific committee which met publicly for several years, on testimony given at two oversight hearings and two series of public hearings, on workshops involving the public, and on documentary evidence including, but not limited to, the following:

1. EPA - Quality Criteria for Water, July 1976, U.S. Environmental Protection Agency, U.S. Government Printing Office: 1977 0-222-904, Washington, D.C. 256-p.

2. EPA - Water Quality Criteria 1972, Ecological Research Series, National Academy of Sciences, National Academy of Engineering, EPA-R3-73-033, March 1973, Washington, D.C. 594p.

3. Davies, P.H. and Goettl, J.P., Jr., July 1976, Aquatic Life - Water Quality Recommendations for Heavy Metal and Other Inorganic Toxicants in Fresh Water , submitted to Water Quality Standards Revision Committee and Colorado Water Quality Control Commission, 29 p.

4. Parametrix Inc., Attachment II - Parametrix Reports - Toxicology Assessments of As, Cu, Fe, Mn, Se and Zn, May 1976, Bellevue, Washington, 98005, submitted to Water Quality Control Commission by Gulf Oil, Inc. 161 p.

5. EPA - National Interim Primary Drinking Water Regulations, 40 CFR, Part 141 (Code of Federal Regulations) Washington, D.C.

6. EPA - Proposed National Secondary Drinking Water Regulations, Federal Register, Vol. 42, No. 62, March 1977, pages 17148–17149.

7. Material generated by the Committee on Colorado Water Quality Standards and Stream Classification, such as Summary of Concentration Limits for the Radionuclides Under Consideration by Numbers Subcommittee, July 1976, Milton W. Lammering, Ph.D., Chief Technical Investigations Branch, Surveillance and Analysis Division, EPA, Washington, D.C. 4 p.

More than thirty meetings, on notice to the public, were held during the formulation of these Regulations.

Section 303 of the Federal Act requires that water quality standards be established for every state. EPA will only promulgate such standards if the state does not promulgate acceptable water quality standards itself. Both the Federal and the State Acts require review of the water quality standards and stream classifications every three years. This review of the standards and classification system is pursuant to that required review.

With the exception of 3.1.4, these Regulations supersede those adopted in May, 1978. They May 1978 regulations superseded or were to phase out the January 1974 Water Quality Standards and Stream Classifications and the Temporary Stream Classification Exception Designated as Class C, effective October, 1976. As the Commission reclassifies State waters, previous classifications will be phased out. Those which have never been classified will be controlled by the Basic and Antidegradation Standards of these Regulations, by effluent limitations, and by classified uses in adjacent waters. Until such time as they are reclassified, streams which were classified under the previous system will be controlled by the limitations accompanying the previous system and all the factors mentioned above.

These Regulations establish basic water quality standards (called Basic Standards) which differ very little from the Basic Standards adopted in January, 1974. Previous Basic Standards stated that “the radioactivity of surface waters shall be maintained at the lowest practicable level and shall, in no case, except when due to natural causes, exceed the latest federal drinking water standard …” . To further clarify the previous Basic Standards, the present Regulations set numeric standards for six radioactive substances. Four of the levels - Cesium 134, Radium 226, and 228, Strontium 90, and Tritium - are identical to those in the federal drinking water standards.

With Plutonium 238, 239, and 240, and Thorium 230 and 232, the numeric standards are consistent with a goal of keeping exposures below 4 millirems per year (the level suggested for other human-made radionuclides in the National Interim Primary Drinking Water Regulations. Because of the difficulty of removing these radionuclides by conventional treatment procedures, it is necessary and important to restrict treatment procedures, it is necessary and important to restrict their levels in the waters. Their potential adverse effect on human health suggests that extreme caution be exercised in their release to State waters. In addition to addressing radioactivity, Basic Standards set forth certain other minimum standards applying to all waters regardless of beneficial use(s). These Basic Standards (Section 3.1.11) are essential to a program designed to protect the waters of the State because they describe the fundamental condition that all waters must meet. All of the previously-cited evidence and testimony form the basis for the Basic Standards.

An Antidegradation Standard, required by state and federal law is included. It requires that the quality of the waters cannot be degraded so as to interfere with their present uses. Furthermore, certain high quality waters may be identified. Because of the special values of these waters, no parameters may be degraded (High Quality Water - Class 1), or may be degraded only when the Commission allows lower water quality as a result of necessary economic or social development (High Quality Water - Class 2).

Under the previous system (January 1974), waters were classified as $A_1$, $A_2$, $B_1$, or $B_2$. Waters designated $A_1$ or $A_2$ were defined as waters suitable or to become suitable for all purposes for which raw water is customarily used, including primary contact recreation. Waters classified $B_1$ of $B_2$ were defined similarly except they were not protected for primary contact recreation. $A_1$ and $B_1$ applied to cold waters and $A_2$ and $B_2$ to warm waters. The temperature classifications were consistent with characteristics for cold and warm water aquatic life. Because that classification system was not comprehensive, dissatisfaction was expressed by many including those being regulated and those doing the regulating. Therefore, a new system was devised where uses to be protected could be identified indivdually and levels for various parameters could be identified which would protect the specified use. Subsequently, a stream could be classified for as many of those uses for which it is presently suitable and those for which it is to become suitable within the next twenty years.

The Classification Subcommittee of the Water Quality Standards and Stream Classification Committee recommended the following classifications: Recreation (primary contact and secondary contact), Agriculture, Aquatic Life (Cold Water and Warm Water), Domestic Water Supply (two classes). The Subcommittee also recommended a Wildlife Classification for protection of critical wildlife areas. This classification has been dropped, however, in favor of a section entitled “Areas Requiring Special Protection” in which various special situations can be addressed on a case-by-case basis.

An Industrial classification and a Stock Watering Classification were considered and rejected by both the Subcommitte and the Commission. Regarding an Industrial classification, it was decided that water supply requirements for different industries vary so greatly that it would be virtually impossible to decide what parameters and what levels would be appropriate for such a classification. At the request of the cattle and dairy interests, the Agriculture classification was defined so that in addition to being suitable for irrigation, it would also be suitable for stock watering. The rationale was that it would be difficult to segregate the two uses. If, in specific areas, the waters are in fact segregated and numeric standards for those parameters to protect stock watering are not necessary, the Commission can respond by not assigning those standards to those waters.

The Aquatic Life classification went through a number of changes during the public hearing process and was eventually defined in terms of habitat. The temperature differentiation was retained resulting in cold and warm water categories under Class 1. The major change was a differentiation made between waters where the potential life forms are presently limited primarily to flow and stream bed characteristics rather than water quality characteristics. An additional classification was added primarily in response to federal requirements that high quality waters be identified in each state. This classification is appropriately entitled High Quality Waters (FORMERLY in two classes).

Stream classifications may either be upgraded or downgraded upon reclassification. Upgrading means that additional uses are identified and will be protected. Downgrading will eliminate one or more of the presently classified uses. A finding must be made by the Commission that the stream is not attaining that use and that such use is unattainable in a twenty-year period because of at least one of the conditions set forth. The first three conditions are essentially the same as the conditions for the Class C Exception under the previous system. The Class C was a temporary classification for the purpose of granting a temporary exception for one or more parameter levels otherwise in effect on a stream. The criteria, however, were of a very permanent nature and are now much more appropriately applied to the more permanent downgrading situation. To accommodate the agricultural industry, an additional criterion was established recognizing agricultural practices considered a satisfactory for the locality. The twenty-year time period for attainability was used because the areawide wastewater management plans (208 plans) are based on twenty years. The regulations also allow the Commission to find that the former classifications had no factual basis and therefore did not reflect actual beneficial uses and that this would be an additional reason for downgrading.

The concept of the previous Class C Exception is now incorporated into a section entitled Temporary Modifications. When a use classification is assigned to a stream, numeric standards may also be assigned to protect that use. When a numeric standard is not being met at the present time, a temporary modification to this numeric standard may be granted. All planning, discharge permits, new wastewater facilities and other water quality control actions are to be geared towards eliminating the need for the temporary modification. Such temporary modifications must be reviewed at least every three years and may be extended or removed. In general, requests for temporary modifications are preferred over the more permanent downgrading. They serve as reminders that conditions are correctable and may increase the priority for funding to attain the classified use and the underlying numeric standard.

In addition, there are Qualifiers which may be appended to a use classification to indicate special considerations. The “Goal” qualifier indicates that the waters are presently not fully suitable for such use. The “Seasonal” qualifiers indicates that the water may only be suitable for the classified use during certain periods of the year. The “Interrupted Flow” qualifier indicates that while flow may be interrupted, the flow conditions still permit the classified use during periods of flow. The expanded use classification, the upgrading and downgrading provisions, the temporary modifications and the qualifiers make this system far more flexible than the previous system.

All waters of the State will be classified under this regulatory system through a process which provides for public notice and a public hearing before any classification of numeric standard is assigned. Whenever possible, the Commission will hold the public hearing in the general locality of the waters being classified. All classifications, standards, and temporary modifications will be assigned by the Commission by rule after consideration of all available data and evidence presented at the hearings, and can be changed only by a new rulemaking decision. Numeric standards will be assigned when there is documentation showing that a particular numeric level is appropriate for protecting the classified use. Standards may be set for an entire stream or for one or more segments thereof. Standards may be assigned at the time classifications are assigned or at any time thereafter, this is intended to be a dynamic process so that new standards may be adopted on a regular basis as the supporting information becomes available. The scientific and technological rationale for the standards will be developed from information obtained at the classification hearings.

Public participation in the process is always encouraged. A change in a classification, standards, or temporary modification may be sought at any time; however, it is within the discretion of the Commission to decide whether or not to consider the proposed change. In any case, all classifications, standards, and temporary modifications must be reviewed every three years.

The establishment of classifications and standards is based on the long-established fact that natural waters have a limited ability to assimilate wastes without rendering the water unfit for various beneficial uses. The quantity of pollutants that can be assimilated by a stream or water body is directly related to the quantity of water available for dilution and assimilation. Stream flows and levels change during the year and from year to year. Extremely low flows or water levels may not provide enough dilution water to

assimilate the pollutants which, under normal or high flows, would not impair the assigned uses; therefore, it is reasonable to establish a flow below which the water quality standards assigned to State waters are not in force. This low flow or water level is commonly accepted as the “minimum annual average seven-consecutive-day flow expected to occur once in ten years” - 7-day 10 year low flow. The 7-day 10-year low flow may be determined by various statistical analyses of stream flow records covering at least ten years.

The Regulations also permit a seasonal average low flow rather than an Annual average low flow. A seasonal average low flow, for instance, may result in a less restrictive discharge permit requirement for ammonia in the winter because of the toxicity relationship to temperature and pH.

Another concept which uses the dilution and assimilative capacity of a stream and may result in a less restrictive discharge permit requirement is the “mixing zone”. A mixing zone is intended to serve as a zone of initial dilution in the immediate area of a discharge. The water quality standards assigned to the receiving waters are not in effect in the mixing zone. The Division designates the mixing zone on a case-by-case basis in accordance with the criteria established in the Regulations, Section 3.1.9(3). The mixing zone is well explained in that section and further information can be found in the Federal Water Pollution Agency's Water Quality Criteria 1968, p. 31.

Attached to the Regulations are three tables showing numeric levels for various parameters. The Tables are not adopted as regulations. The numeric levels set forth in the Tables are levels established by the commission after careful analysis of all available information and are generally considered to protect the beneficial use classifications of the waters of the state. They are intended to guide the commission and others at the use classification and numeric-standard-setting hearings. They carry no presumptive validity or applicability. Numeric standards may not be assigned for all the parameters listed in the Tables, and conversely, standards may be assigned for parameters which are not listed in the Tables.

## 31.21 STATEMENT OF BASIS AND PURPOSE (1984 REVISIONS):

In accordance with the requirements of 24-4-103(4), C.R.S. 1973, the Commission makes these findings and adopts this Statement of Basis and Purpose. The Commission, at a public rulemaking hearing November 14, 1983, and December 12, 1983, adopted minor and editorial corrections to clarify the Commission's current regulations numbered respectively 3.1.0, 3.4.0, 3.5.0, 3.6.0, and 3.8.0. These regulations are contained in Article 3, Water Quality Standards and Classifications, of the Policies, Regulations, and Guidelines of the Water Quality Control Commission. (5CCR 1002-8)

In adopting these corrections and clarifications, the Commission considered the economic reasonableness of its action. The scientific or technological rationale of the Commission in justifying the changes to its rules was that it made the classifications and standards which it had previously assigned more technically correct and accurate. The consolidated changes adopted by the Commission are provided with this Basis and Purpose. The Secretary of State is being provided corrected pages for each of the regulations as replacements for pages previously published in those regulations.

An issue raised during the hearing, was whether or not the table of organic parameters should be moved from the Appendix to the text. The Commission included standards for organic parameters in the regulations it adopted for each of the River Basins of the State. Thus, standards for organic parameters were applicable Statewide, prior to the hearing to consider the changes to which this Statement of Basis and Purpose is applicable. This has had the same effect as would have a basic standard applicable to all waters of the State.

The Commission finds that it would be easier to make changes to one document, the Basic Standards and Methodologies, as future scientific information necessitates, than to make such changes in each basin. Thus it is more economically reasonable to deal with the organic substances in one regulatory document, rather than many. There was testimony that it was confusing to have the table of organic parameters as criteria guidance subject to change on a stream by stream basis when the parameters had

been assigned and were not merely to provide guidance. It was testified that it would be less confusing to have the table in the text of the regulation to provide basic standards.

The City of Loveland testified that if the table in question were moved to the regulatory text there was the possibility of a basin standard differing from the general standard. The Commission found that its regulations enabled it to set site specific standards to stream segments as an exception to the basic standard, and that for the parameters in this table it was unlikely to have different basin standards.

The organic parameters in the table are not substances that form a naturally occuring background. T hey are toxic controlled at the point of sale or use. They are not ambient and subject to the same treatment as are other naturally occurring parameters. The Commission found it inappropriate to regulate these organic constituents in the same manner as are those that can be ambient or uncontrollable background parameters. Therefore, the Commission changed the guideline table to a basic standard in the body of the regulation.

FISCAL IMPACT STATEMENT

Regarding the Adoption of Minor Corrections and Clarifications for the Basic Regulations and Corrections to the Numeric Standards for the San Juan and Dolores, Gunnison and Lower Dolores, Rio Grande, and the South Platte River Basins.

In accordance with section 24-4-103(8) (d) the Commission finds that the corrections and clarifications to its current regulations numbered respectively, 3.1.0, 3.4.0, 3.5.0, 3.6.0, and 3.8.0, have no quantifiable fiscal impact, although it is expected that these regulations will be more readily usable by the regulated industries and the general public.

PARTIES TO PROCEEDINGS

1. Climax Molybdenum Corporation
2. Trout Unlimited
3. Colorado Municipal League
4. City of Loveland
5. Eastman Kodak Company

## 31.22 STATEMENT OF BASIS AND PURPOSE (1987 REVISIONS)

### A. BACKGROUND

These amendments to the Basic Standards and Methodologies were made as a result of a February, 1983 triennial review hearing which revealed dissatisfaction with several elements of the regulation. The Commission organized a task force of three committees of selected scientific experts representing several points of view in early 1985:

(1) The Water Quality Standards and Methodologies Committee, to address issues relating to metal toxicity and issues regarding the methodologies used to set water quality standards;

(2) The Nitrogen Cycle Committee, to address issues relating to determining appropriate water quality standards for nitrogenous compounds; and,

(3) The Aquatic Life Committee, to evaluate the system for adopting aquatic life classifications.

Reports from the three committees were completed in early 1986. The recommendations of the Water Quality Standards and Methodologies Committee and the Nitrogen Cycle Committee formed the basis for the proposed revisions that were considered at this hearing. The Commission decided to take no action with respect to the recommendations of the Aquatic Life Committee in this hearing, because it felt that the

recommendations advanced did not warrant proposing changes to the classification system at this time. Revisions of the aquatic life classification system may be considered at a later date.

At least one party recommended that a separate peer review process regarding the committee reports be held prior to taking action on revisions to the Basic Standards and Methodologies. The Commission believes that this hearing process provided an adequate opportunity to review those aspects of the reports relied on in the proposed revisions.

## B. OVERVIEW OF REVISIONS

The revisions adopted by the Commission make a variety of changes in the system for establishing and implementing site-specific water quality standards in Colorado. The following are the major areas in which the Commission made or considered changes:

(1) New or revised site-specific standards for metals shall be based on dissolved metals whenever adequate evidence to justify such standards is presented in a hearing. The existing total recoverable metals standards shall remain in effect until superceded by standards promulgated under the new system. For discharge permits, effluent monitoring to determine compliance with metals limitations based on dissolved metals standards shall use the potentially dissolved method, unless it is demonstrated that dissolved analysis is statistically comparable for the discharge in question.

(2) A methodology has been adopted for setting site-specific ambient quality-based standards that is similar to the methodology previously used in practice, with certain important differences. Where ambient quality exceeds table values, but is determined adequate to protect uses, chronic standards may be set equal to the 85th percentile of the available representative data. For metals, determination of new ambient quality-based standards will be based on the dissolved method. The Commission intends that the determination of what data are representative shall be made consistent with the Division's established procedure for exclusion of outliers.

The Commission also has added to the regulation a statement of a second alternative approach to setting site-specific standards, referred to as site-specific-criteria-based standards.

(3) Revised aquatic life table values have been adopted for metals. Both chronic and acute values are established in Table III. Site-specific metals standards also may be established in accordance with the provisions for ambient quality-based standards and site-specific-criteria-based standards.

(4) New aquatic life table values have been adopted for unionized ammonia. Both chronic and acute values are established in Table III. Site-specific unionized ammonia standards also may be established in accordance with the provisions for site-specific-criteria-based standards.

(5) Revised aquatic life table values have been adopted for nitrite. The Commission considered, but rejected, proposed revisions to the agriculture table values for nitrite and nitrate.

(6) The Commission considered, but rejected, a proposal to establish a new domestic water supply classification.

(7) The Commission considered proposals to modify the current low flow criteria in the regulation. The Commission decided to make no major changes at this time, pending analysis of a low flow study undertaken by Colorado State University.

(8) The Commission ratified its previous action deleting section 3.1.4, so that deletion will be reflected in the published regulations.

The basis and purpose for each of these actions is discussed in the following sections of this statement of Basis and Purpose.

The July 31, 1988 effective date has been selected for several reasons. First, the Commission felt that it could reach a consensus on the revisions adopted herein. To delay final adoption of these revisions to a later date along with the other issues described below would have unnecessarily complicated new hearings with old issues and would have possibly required a total rehearing due to the turnover of membership on the Commission.

Second, certain technical issues (particularly relating to low flows) that the Commission had hoped to address in this rulemaking proceeding were not addressed as fully as the Commission had hoped during the hearing. The Commission hopes to address those issues in a new rulemaking hearing prior to the effective date of these revisions, so that any additional technical changes can become effective as part of one overall package, reducing the confusion and disruption that could result from two successive major sets of revisions of the regulation.

Third, EPA has raised several issues regarding the adequacy of the Basic Standards and Methodologies. The Commission intends to hold a rulemaking hearing regarding those issues sometime between December, 1987 and March, 1988. Therefore, the Commission again hopes that any changes to the regulations that may be determined necessary relating to the issues raised by EPA can become effective as part of one overall package, to avoid multiple revisions going into effect at different times.

Fourth, the Commission recognizes that a number of the revisions now being adopted are major. Because the range of options considered in this hearing was wide, it may be that there are aspects of the specific changes adopted which could usefully be further clarified. Therefore, between now and the effective date of these revisions the Commission may consider the adoption of further refinements of these changes if that appears appropriate.

The Commission gave extensive consideration to the public and private costs potentially associated with implementing a major overhaul of the State's water quality standards system. In several instances the Commission has attempted to minimize these impacts by minimizing the magnitude of the change. (E.g. the 85th percentile ambient quality-based standards methodology adopted is very similar to the previously-used mean plus standard deviation ( $\bar{x}$ + s) methodology, especially compared to the more stringent 50th percentile hearing proposal; the new table values for unionized ammonia are similar to existing values and the previous approach to setting site-specific ammonia standards has been ratified; proposed changes to domestic use classifications and agriculture table values were rejected.) In addition, the Commission hopes to minimize the dislocation caused by these changes by ratifying all existing site-specific standards and implementing the revised system on a basin-by-basin, segment-by-segment basis as adequate data becomes available. Adoption of these revisions to the Basic Standards and Methodologies in no way undermines the legitimacy or effectiveness of existing site-specific standards adopted under the previous system.

Generally, the Commission Contemplates that standards will be revised in conjunction with the triennial review of each basin's standards. The new provisions are being adopted because they represent an improvement and refinement of the existing system based on more recent information, not because the existing system is based on material assumptions that were in error or no longer apply. Therefore, this revision of the Basic Standards and Methodologies does not by itself create grounds for site-specific hearings pursuant to 25-8-207, C.R.S. However, the Commission may in its discretion hold hearings to revise site-specific standards in accordance with the new system prior to the next triennial review for a basin where exigent circumstances warrant.

The Commission intends that when considering revision of site-specific standards based on the new system, either all or none of the standards on a particular segment will be revised to conform with the new system, unless there is a compelling justification to vary from this procedure. This should mean that during the transition period of implementation of the new system, dischargers on any given segment are dealing with either the old system or the new system, not a mixture of both. In some instances, during the

transition period it may be desirable to collect and analyze data for both total recoverable metals and dissolved metals. At least one party recommended that the Commission adopt a revised system as an alternative to the existing methodologies, without doing away with the existing system. The Commission rejected this approach because it believes it is important to move, over time, to a single, consistent standard-setting system. However, retaining existing site-specific standards and implementing the new system on a site-specific basis only when adequate data is available will ease the transition to the new system.

Although it is not feasible to predict the impact of implementing this new water quality standards system for each stream segment in the State, from the evidence submitted it is clear that certain site-specific standards may become more stringent while others may become more lenient. For example, the revised table values will result in some more stringent standards and some less stringent standards for various metals, depending on water hardness. The new table value acute standards generally will result in less stringent daily maximum effluent limitations in discharge permits. Basing standards on dissolved metals will result in lower in-stream metals standards in certain instances, but this is partly compensated for by corresponding changes in the methodology for analysis of discharge effluents.

The Commission finds that the revisions as a whole are economically reasonable because the new water quality standards system is more scientifically justifiable. Any practical water quality standards system must rely on simplifications and generalizations of the large variety of conditions that exist in nature. In general, the Commission finds that the revisions being adopted as scientific improvements in the system will minimize the potential for over-protection (saving the resources of dischargers) and minimize the potential for under-protection (reducing unwarranted impacts on the State's water quality resources). Therefore the revisions are justified by the need to base standards on the best scientific information available, to the maximum extent feasible.

## C. ANALYTICAL TECHNIQUES FOR METALS (Sections 3.1.7, 3.1.14, Table III)

The shift to basing water quality standards on dissolved metals has been undertaken because the evidence indicates that it is the dissolved fraction that is principally responsible for impacts to aquatic life. EPA proposed reliance on an “acid soluble” method for establishing ambient criteria, but the Commission believes the evidence adequately supports reliance on the dissolved method. Generally, the dissolved method more accurately measures (compared to total or total recoverable analyses) the ionic form of metals that is toxic to aquatic life, while excluding less toxic complexed forms. The acid soluble method may overstate the metals that are biologically available to aquatic life.

In addition, dissolved ambient water quality data tends to be more “normally” distributed than total or total recoverable data. Therefore, dissolved data is better suited to the methodology adopted for setting ambient quality-based standards, including the use of Chauvenet's Criteria to screen potential outliers.

Adoption of the potentially dissolved method for effluent monitoring may overstate the availability of ionic metals in an effluent. However, the dissolved method would potentially understate the availability of ionic metals once an effluent has mixed with receiving waters. For example, this would occur where stream pH is lower than effluent pH, so that more metals would be released into solution after mixing with the lower pH receiving waters. To better ensure protection of aquatic life, the Commission has decided as a matter of policy to require the more conservative approach. Also, it is noted that a discharger has the option of using the dissolved method to monitor its effluent if it can demonstrate that the dissolved and potentially dissolved fractions in its effluent are not significantly different.

Because extensive in-stream metals data has not previously been generated, this shift in methodologies will result in additional monitoring costs for the State and the regulated community. However, in certain instances it may be possible to set new dissolved standards without extensive new in-stream data; for example, where table value standards are determined to be appropriate or where appropriate assumptions can be made to set dissolved standards based on existing total recoverable data.

As discussed in the “Overview of Revisions” section of this Statement of Basis and Purpose, current site-specific water quality standards (including metals standards not based on the dissolved method) remain in effect in spite of the adoption of these revisions to the Basic Standards and Methodologies until new site-specific standards are adopted. The Commission intends to move as quickly as feasible (generally through the triennial review process) to the adoption of site-specific dissolved metals standards throughout the State. All interested parties are encouraged to begin collecting and analyzing in-stream metals data using the dissolved method.

Finally, the Commission notes that using dissolved metals values for aquatic life in Table III while using total recoverable values for agriculture and domestic water supply could result in requirements for multiple analyses of water quality samples in some circumstances. It is the Commission's intention that the Division avoid or minimize this result in establishing discharge permit monitoring requirements to the extent feasible, by making appropriate assumptions regarding the relative levels of dissolved and total recoverable metals present.

**D. AMBIENT QUALITY-BASED STANDARDS (Section 3.1.7)**

For normally distributed data, the new 85th percentile methodology for setting chronic ambient quality-based standards is comparable to the mean plus standard deviation **(** $\bar{x}$ + s) approach previously used. For data sets with a large standard deviation, the 85th percentile methodology will result in a more protective standard. (As discussed above, the shift to dissolved metals analysis will generally result in lower numeric ambient quality-based standards.)

In determining what is “representative data” for setting ambient quality-based standards, the Commission intends that the Division's established procedure for excluding outliers be applied. In order to retain appropriate site-specific flexibility in the process, the Commission decided as a matter of policy not to specify specific techniques for screening outliers in the regulation.

In adopting 85th percentile methodology, the Commission rejected a proposal to set chronic ambient quality-based standards equal to the 50th percentile of representative data and acute ambient quality-based standards equal to the 90th percentile. A shift to the 50th percentile for chronic standards would result in uniformly more stringent water quality standards and effluent limitations compared to the current system. The Commission does not believe that the evidence justifies this change or demonstrates that the 85th percentile methodology (which is generally comparable to the current $\bar{x}$ + s methodology) is insufficiently protective of state waters. Adoption of the 85th percentile methodology means that it is expected that 15 percent of the data for a given segment is expected to exceed standards set equal to the 85th percentile. Such exceedances do not constitute a violation of ambient quality-based standards.

There was evidence submitted that setting an ambient quality-based standard above the 50th percentile can result over time in a “creeping mean.” In other words, since dischargers can discharge up to the standard, over time the mean water quality value may increase, justifying an upward revision of the standard, based on a new 85th percentile value. Other testimony indicated that this risk is largely theoretical, since dischargers must plan to routinely discharge at levels below established effluent limitations in order to assure that they remain in compliance. In addition, because permit limitations are based on low flows, during most of the year discharge levels should not result in a significant increase in ambient levels. Moreover, standards based on ambient quality generally are set factoring out the contribution of point source discharges. The Commission determined that the theoretical creeping mean is not likely to occur.

The revised regulation also explicitly provides for an additional alternative basis for establishing site-specific standards. Site-specific-criteria-based standards may be established when justified by the results of a bioassay or comparable scientific study. This provision essentially codifies previous practice and preserves flexibility in the standard-setting process. It provides a mechanism for taking the wide variation of conditions that exist in Colorado into account when adopting site-specific standards. For example, site-specific standards may be determined from a recalculation based on the species present at a particular location.

The Commission finds that in certain circumstances even substantial improvements in water quality will not result in any furtherance of the “fishable-swimmable” goal, as where factors other than water quality limit the diversity and abundance of aquatic life. Under such circumstances it would be unsound policy to require standards reflecting a need for substantial improvements in water quality.

**E. REVISED TABLE VALUES FOR METALS (Table III)**

The adoption of new tiered, acute and chronic table values for metals should result in more accurate protection of water bodies from short and long-term impacts. The values have been adopted using the current EPA water quality criteria, modified to apply to Colorado. Some parties testified that the new table values are inappropriately based on excessive, multiple safety factors. However, EPA testified that in certain respects the approach adopted by the Commission is not conservative enough. The Commission has decided as a matter of policy that the safety factors provided are not excessive. This conclusion is reinforced in part by the fact that the new chronic table values are partly more stringent and partly less stringent than the existing table values.

Moreover, the Commission feels that the safety factors reflected in the table values are appropriate and necessary because those values are intended to protect aquatic life over a wide range of conditions throughout the State. The conservative nature of the table values is tempered by the availability of alternative approaches to setting site-specific standards when justified by available site-specific information. Both ambient quality-based standards and site-specific-criteria-based standards are available alternatives in such circumstances.

For simplicity, the Colorado Final Chronic value (FCV) as described in the Water Quality Standards and Methodologies Committee report is referred to in the regulation as the “chronic” value. The Colorado Criterion Maximum Concentration (CMC) is referred to as the “acute” value. The Committee report also discussed a Colorado Final Acute Value (FAV), to be applied when more extensive monitoring is undertaken. The Commission considered but rejected the option of establishing alternative acute table values equal to the FAV.

Some parties testified that an acute (i.e. 24-hour average) standard based on the CMC is excessively stringent, since the CMC is equal to one-half of the FAV, which in turn represents the 96-hour LC-50 that should protect 95 percent of the genera from acute toxic effects. The Commission decided as a matter of policy that the more conservative CMC-based acute standards are appropriate. The Commission felt that an alternative acute standard equal to the FAV walks too close to the edge of potential impacts. In fact, it is a concentration expected to adversely impact 50 percent of the fifth percentile of the genera tested. Moreover, there was testimony that the costs of the increased monitoring that would be required to allow reliance on a more lenient alternative acute standard would be excessive so that dischargers would be unlikely to choose that option.

The majority of the new Table III metals values are based on equations that rely on ambient measurements of water hardness. The equations reflect the reduced toxicity of metals in higher hardness waters. The proposed revisions also provided that alkalinity values may be substituted for hardness in the equations. This would have been generally consistent with the Commission's previous practice of using the more stringent of available hardness or alkalinity data in determining the applicable “range” of metals values in Table III and setting site-specific standards based on that determination. The Commission felt that there was insufficient evidence justifying a direct substitution of alkalinity into equations developed based on hardness. The new table value equations are based on a data base that uses hardness data. For these reasons, the Commission deleted the alternative of substituting alkalinity into the Table III equations. Where appropriate site-specific evidence has been developed, alkalinity may be a factor in establishing site-specific-criteria-based standards.

Several parties testified that the proposed table values in certain instances unacceptably result in standards below detection limits associated with standard analytical techniques. However, the evidence generally was lacking in specific information to demonstrate that detection limits present a practical problem in implementing stream standards, although similar concerns had been raised in earlier hearings.

One witness did propose adoption of a new set of definitions to address the concerns raised. Because this issue was not addressed in the notice for this hearing, and because the Commission feels that insufficient information was presented at the hearing to warrant new provisions regarding detection limits at this time, the Commission has not included any such provisions in the revisions being adopted. This issue may be addressed in a future rulemaking hearing if specific information and/or proposals submitted to the Commission warrant.

Footnote 5 to Table III states that standards based on these table values are not to be exceeded more than once every three years on the average. This provision is adopted based on evidence that aquatic life can recover from impacts if not exposed to exceedances more frequently than once every three years.

Finally, the Commission notes that the new acute metals table values adopted, once translated into site-specific acute standards, may in many instances result in less stringent short-term effluent limitations in discharge permits, as compared to the current system. Currently, daily maximum effluent limitations generally are established equal to twice the 30-day average effluent limitation. Because the new acute table values often are more than twice the corresponding chronic value, standards based on these numbers would result in less stringent daily maximum effluent limitations.

## F. REVISED UNIONIZED AMMONIA TABLE VALUES (TABLE II)

The adoption of new tiered, acute and chronic table values for unionized ammonia should result in more accurate protection of water bodies from short and long-term impacts. The new acute table values for class 1 warm and cold water aquatic life are based on equations that take pH and temperature into account. The primary controversies regarding these equations centered on the extent of safety factors included and the appropriate universe of aquatic life on which to base the equations.

With respect to acute values, the Commission adopted an approach consistent with its adoption of new acute table values for metals. That is, the acute unionized ammonia values are based on one-half of the 96-hour LC-50 level that protects 95 percent of the genera. In general, the Commission believes that the safety factors present are not excessive.

With respect to species considered in developing the equations, the Commission decided as a matter of policy that the golden shiner and orangethroat darter should be included. Even though these species are present only in limited areas, they should be included in a statewide value intended to protect waters throughout the state. Under the alternatives provided in the revised regulation, site-specific-criteria-based standards (which may not be protective of these specific species) can be established in lieu of table value standards where warranted by available information.

Consistent with the methodology underlying the equations for new metals table values, the Commission determined that invertebrates should be included in developing the ammonia equations. Healthy invertebrate populations are essential to viable aquatic ecosystems. However, including some invertebrates in the calculations did not change the final table values.

The Nitrogen Cycle Committee proposed varying ammonia standards based on whether salmonids are present or absent, rather than on whether waters are cold or warm. Because this change would not result in a major difference in the standards applied to most state waters, the Commission chose to stay with the current system of basing distinctions on cold versus warm water. This will help minimize disruption of the current system.

The Class 1 cold and warm water, acute and chronic table values adopted conform with the recommendations of the Nitrogen Cycle Committee, based on EPA documentation (translating salmonid/non-salmonid values into cold/warm water values, respectively), with minor modifications. The acute values are based on EPA's criteria calculation procedures. The cold water acute value results specifically from data on the adult male rainbow trout. The warm water acute value results from using in the EPA equations available data for warmwater species found in Colorado.

The Class 1 cold and warm water chronic values are the same as those contained in the existing regulation. The Nitrogen Cycle Committee recommended values of 0.02 mg/l and 0.05 mg/l for cold and warm water segments, respectively. These values were calculated to correspond to the 95 percent protection level when the number of taxa in the calculation is 19. However, for several reasons the Commission decided not to lower the chronic value to 0.05 mg/l as proposed. There was evidence submitted that it is difficult to distinguish between aquatic life impacts resulting from 0.06 mg/l versus 0.05 mg/l unionized ammonia. Adoption of the 0.06 mg/l value has the benefit of minimizing disruption to the current standards-setting system. This is particularly appropriate when the lower 0.05 mg/l value could result in substantial additional costs for some dischargers, without necessarily resulting in identifiable environmental benefits.

The Class 2 cold and warm water acute and chronic table values are essentially the same as Class 1, except that a range of 0.06 to 0.10 mg/l is provided for chronic values, depending upon the aquatic life present or intended to be protected on a site-specific basis, and whether the waters have been adversely impacted by factors other than ammonia. The evidence demonstrated that values near the higher end of this range may not be protective of certain species, such as the Johnny darter. Therefore, the absence of such sensitive species should be demonstrated to justify a site-specific standard in the upper end of the range.

The adoption of the 0.06 to 0.10 mg/l range is based on a policy judgement regarding the appropriate degree of flexibility to vary precise protection levels and take into account site-specific circumstances when adopting site-specific standards. A level of 0.08 mg/l unionized ammonia represents the 90 percent protection level. Moreover, the Nitrogen Cycle Committee found that it is difficult to toxicologically differentiate between the 0.08 and 0.10 mg/l levels. Thus, the upper end of the range accepts some sublethal effects. One study of the South Platte River (entitled “Physical, Chemical, and Biological Characteristics of the South Platte River, Segment 15, in Relation to Classified Uses” , by William M. Lewis, Jr. and James F. Saunders III, dated November 13, 1985) found no identifiable differences in diversity or abundance of aquatic life for unionized ammonia levels in the range of 0.05 to 0.10 mg/l.

Finally, although the Committee report recommended that a chronic standard greater than 0.10 mg/l not be allowed, under the approach adopted by the Commission a higher site-specific standard could adopted for severely impacted segments where justified by an appropriate site-specific study in accordance with Section 3.1.7(1) (c) (iii) of the regulation. Such a study may consider whether factors other than ammonia reduce the diversity and abundance of species present.

## G. REVISED NITRITE STANDARD FORMULA (Table II)

The revised aquatic life table values for nitrite are based on equations that take into account the buffering effects of chloride ions on nitrite toxicity. The City of Longmont testified that this approach included too many safety factors, while Denver Metro supported the proposal. The Commission has decided as a matter of policy that the safety factors included are appropriate. The Commission intends that existing nitrite standards will remain in effect until adequate chloride data is developed on a site-specific basis to allow application of the new formula.

The Nitrogen Cycle Committee also proposed revisions of the nitrite and nitrate table values for the agricultural use classification. No public comment was received regarding this proposal and the Commission has decided to make no change in the existing table values at this time.

## H. DOMESTIC WATER SUPPLY CLASSIFICATIONS (Section 3.1.13(1) (d))

The Nitrogen Cycle Committee proposed subdividing the current domestic water supply classification for surface waters into two classifications, depending on the levels of total ammonia present and the need for standard or special treatment of waters prior to use. The hearing proposal for a new classification was similar, but not tied specifically to ammonia levels. Limited comment was received regarding this proposal. Because questions regarding the application and impact of this proposed new classification have not yet been fully examined, the Commission has decided to make no changes in the existing

domestic water supply classifications at this time. In particular, the Commission was concerned that the proposal would have resulted in a new “priority to pollute” concept being added to Colorado water quality regulation, accepting the presence of pollution if an upstream discharge is established prior to a downstream water supply use.

**I. LOW FLOW CRITERIA (Section 3.1.9(1))**

As noted above, the Commission decided to make no change in the current low flow criteria at this time, pending analysis of additional information, including the results of a low flow study undertaken by Colorado State University. The Commission contemplates that this issue will be addressed in an additional rulemaking hearing prior to the effective date of these revisions.

**J. DELETION OF SECTION 3.1.4**

Section 3.1.4 of the Basic Standards and Methodologies, entitled “Implementation” , was repealed effective June 9, 1980, after a public hearing on March 3, 1980, but was not deleted from the Colorado Code of Regulations by the Secretary of State's Office. The Commission's action here merely ratifies that earlier action, so that the deletion will appear in the official published regulation.

**FISCAL IMPACT STATEMENT**

The most significant change embodied in these amendments is the use of dissolved metals standards dependent upon hardness levels instream, and the corresponding requirement of the potentially dissolved metals analytical test by dischargers. Since a relatively small ambient data base for dissolved metals exists compared to the total recoverable data base, it is unknown at this time whether this change in metal form will require additional treatment costs for dischargers of metals to state waters. However, it is likely that some relief in the form of relaxed discharge limits may be realized by adopting this new system since most metals in effluents are likely to be in the bound or total form.

Some site-specific standards may become more stringent as a result of these revisions and some less stringent (once the revisions are translated into new site-specific standards). Therefore, for some dischargers costs may increase while for others they decrease. More specifically, limitations may become more stringent for some that discharge to low hardness waters and less stringent for those that discharge to high hardness waters.

The use of acute and chronic standards with the corresponding two-tiered discharge permit limits will allow more flexibility to the discharger by not penalizing him for short-term excursions above a chronic limit. In many instances short-term effluent limitations under the new system will be less stringent than short-term effluent limitations under the previous system. This should result in less economic burden to dischargers of both metals and nitrogen compounds.

Since the ammonia table values are essentially identical to previous standards, no major additional economic consequences are anticipated from these revised provisions. In isolated circumstances, the new table values for Class 2 aquatic life classifications could result in more stringent ammonia standards on a site-specific basis. In such instances, the economic impact of such standards will be addressed in the site-specific hearings. The other changes to nitrogen parameters should have no substantial economic ramifications.

The recognition of tolerable excursion of these standards no more than once every three years should also provide some economic relief to dischargers since previously the level of tolerance was once every ten years.

These changes are all made in recognition of maintaining the beneficial uses of the state's waters. Preservation of the uses to the level maintained in the recent past represents an economic benefit to the citizens of the state. In general, the Commission finds that the revisions being adopted as scientific

improvements in the system will minimize the potential for over-protection (saving the resources of dischargers) and minimize the potential for under-protection (reducing unwarranted impacts on the State's water quality resources).

PARTIES TO PROCEEDINGS

1. Adolph Coors Company
2. Castle Pines; Silverthorne/Dillon; and Purgatory
3. Larimer-Weld Regional Council of Governments
4. Cotter Corporation
5. The Colorado Association of Commerce and Industry (CACI)
6. The City of Boulder
7. The City of Loveland
8. The City of Longmont
9. AMAX Inc.
10. The Colorado Water Congress (CWC)
11. Eastman Kodak Company
12. Trout Unlimited
13. Colorado Mining Association (CMA)
14. Gulf & Western
15. Metro Denver Sewage Disposal District No. 1

## 31.23 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (1988 REVISIONS-ANTIDEGRADATION)

The provisions of 25-8-202(1)(a),(b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4) and 24-4-103(8)(d) C.R.S., the following statements of basis and purpose and fiscal impact.

**BASIS AND PURPOSE:**

### A. ANTIDEGRADATION

#### 1. Basis for Antidegradation Provisions

Section 25-8-102(2), C.R.S., declares a public policy “to conserve state waters and to protect, maintain, and improve, where necessary and reasonable, the quality thereof for public water supplies, for protection and propagation of wildlife and aquatic life, for domestic, agricultural, industrial, and recreational uses, and for other beneficial uses.” To implement this policy, the Commission is required to “develop and maintain a comprehensive and effective program for prevention, control, and abatement of water pollution and for water quality protection throughout the entire state.” Section 25-8-202(1), C.R.S. As part of the water quality protection program developed to implement these statutory directives, the antidegradation provisions that are now being revised have been in place since 1979. The current Commission reaffirms its belief that an appropriate antidegradation rule is an important and integral part of a comprehensive and effective water quality protection program designed to serve the statutory purposes.

The Commission believes that Colorado's highest quality waters are a unique natural resource that warrants special protection. Moreover, the Commission believes that the revised antidegradation rule and review process set forth in the accompanying revisions are economically reasonable. Therefore, the amendments also are consistent with that portion of the legislative declaration set forth in section 25-8-102(5), C.R.S. Assuring protection of Colorado's unique, high quality natural environment is an important component of maintaining the attractiveness of our State for future economic development. At the same time, the revisions now being adopted are designed to assure that important economic or social development will be allowed to proceed even where such development requires limited degradation of high quality waters, so long as there has been an adequate investigation of potentially non-degrading alternatives. In this regard, it is important to recognize that the use classifications and narrative and

numeric water quality standards already in place will prevent any major degradation of high quality waters. In no case may degradation exceed water quality standards or interfere with or injure existing classified uses. Irrespective of the antidegradation policy, in many instances no further degradation for particular parameters on Colorado streams will be allowed because numeric standards have been set equal to the existing ambient water quality.

The Commission believes that the antidegradation rule as revised is one useful tool to assure the protection of beneficial uses of State waters for current and future generations. Although the water quality standards system has become substantially more sophisticated over the last decade, there are still significant uncertainties regarding the levels of specific pollutants that are consistent with the protection of various uses, and there are many specific pollutants for which no water quality standards have been set. In the face of this uncertainty, the antidegradation rule provides an extra layer of protection for the beneficial uses of the State's highest quality waters.

Finally, the revisions adopted should help eliminate any controversy regarding whether Colorado's antidegradation standard satisfies the requirements of the federal Clean Water Act. Although the Commission believes that its previous antidegradation provisions were legally valid and had effectively been approved by EPA, these revisions should largely eliminate that issue. Therefore, while the Commission has proceeded by attempting to determine what antidegradation policy is in the best interests of the State of Colorado, an additional benefit of these revisions is that they should more clearly comply with requirements established by EPA under the federal Clean Water Act.

**2. Hybrid Antidegradation Review Approach**

The previous version of this regulation relied on a classification-based approach to antidegradation – i.e., only waters classified “High Quality” were subject to antidegradation review requirements. EPA initially advocated a purely non-classification-based approach to antidegradation – i.e., all waters would potentially be subject to antidegradation review requirements, depending on a site-specific assessment of quality at the time that an individual activity undergoes review. The revisions adopted create a hybrid approach to antidegradation. The regulation now establishes three categories of waters for antidegradation purposes: (1) waters designated High Quality 1 or 2, (2) waters designated “Use-Protected” , and (3) waters classified cold water aquatic life class 1, or warm water aquatic life class 1 and recreation class 1, with no affirmative or negative quality-based designation. This hybrid system combines many of the benefits of the previous classification-based approach with benefits of the non-classification-based alternative advocated by some parties.

When sufficient evidence is available, the system adopted preserves the option for the Commission to make the policy decision as to which waters do or do not warrant the extra protection afforded by an antidegradation review. Such action by the Commission occurs in a rulemaking forum, which is more conducive to broad public review and comment than decisions made solely in connection with the processing of individual permits. At the same time, the hybrid approach retains flexibility to handle on a case-by-case basis a category of waters which - due to lack of information or ambiguous factual characteristics - do not warrant a formal, affirmative or negative quality-based designation. This flexibility is similar to that available under the non-classification-based alternative.

The hybrid approach preserves the additional benefit of being a proactive, planning-based approach instead of a purely reactive system. Under the purely non-classification-based alternative, a determination of which waters are “High Quality” can be made only at the time there is a specific proposal to degrade those waters (e.g., a new point source discharge). Once a specific development is at issue, it may be more difficult to make an objective determination whether the waters in question warrant special protection. With the hybrid approach, a decision may be made as to which waters warrant special protection prior to a confrontation with specific proposed developments. Once the initial water quality-based designation decisions are made, the public is on notice in advance that waters designated “High Quality” will receive the special protection provided by the antidegradation review. Furthermore, the addition of the “Use-Protected” designation option allows the public to be put on notice that the

antidegradation review will not be required for specified streams, where site-specific facts warrant that designation.

**3. Revised Antidegradation Rule (section 3.1.8(1))**

The title of this section has been changed from “Antidegradation Standard” to “Antidegradation Rule.” This new title more accurately describes the nature of the revised regulation. The antidegradation provisions are not themselves a water quality standard, but rather a set of criteria and requirements that determine whether specific waters are to be maintained and protected at existing quality or rather protected solely by applicable narrative and numerical water quality standards. The Commission rejected the title “Antidegradation Policy” because “policy” might imply non-mandatory provisions. Consistent with this change in terminology, section 3.1.7(1)(a), which listed “antidegradation standard” among those standards that may be applied to State waters, has been deleted.

Although many of the concepts in the previous antidegradation provisions have been retained in the new section 3.1.8(1), this material has been completely reorganized and rewritten consistent with the new hybrid approach. Section 3.1.8(1)(a) describes the three levels of water quality protection that may apply to Colorado surface waters, and essentially replaces the provisions of the previous section 3.1.8.

Subsection 3.1.8(1)(a)(i) regarding High Quality 1 waters has been revised to delete the previous “no degradation” language. The revised language is consistent with that in EPA's antidegradation policy. This change is intended to recognize, as EPA has, that activities which result in only temporary or short term changes in water quality may be allowed for these waters.

Subsection 3.1.8(1)(a)(ii) regarding waters subject to an antidegradation review has been revised to pattern the language in EPA's antidegradation policy more closely. As elaborated in the discussion of the antidegradation review process below, the Commission believes that this language forms the basis for a reasonable and appropriate Colorado regulation.

In subsection 3.1.8(1)(a)(iii), the regulation now specifies that it is existing classified uses that are to be protected. This should not represent a significant change in practice since, pursuant to section 3.1.13, all existing uses should be classified uses. The language also now clarifies how protection of classified uses may be measured – i.e. by compliance with narrative and numerical standards.

Subsection 3.1.8(1)(b) summarizes which waters are and are not subject to the antidegradation review requirement, which provides the intermediate level of water quality protection described in subsection 3.1.8(1)(a)(ii). This subsection establishes the hybrid approach: Based on the High Quality 2 and Use-Protected designations certain waters will always or never require antidegradation reviews, while a middle category is reserved for which an antidegradation review is potentially required, based on a case-specific assessment. This case-specific quality assessment provides flexibility by focusing specifically on parameters likely to be adversely impacted by a particular proposed activity.

The language in the regulation clarifies that an activity-specific determination under this subsection does not create a water quality-based designation for the waters in question. Of course, based on information generated in connection with such an activity-specific assessment, the division or any other person could request that the Commission consider adopting a High Quality 1 or 2 or a Use-Protected designation for the waters.

**4. Water Quality-Based Designation Criteria (section 3.1.8(2))**

**a. Overview**

The criteria for designating waters “High Quality” have been moved from section 3.1.13 to section 3.1.8. In addition, the terminology has been changed to refer to “water quality-based designations” rather than “classifications”. A definition of this term has been added to section 3.1.5. These changes are intended to

avoid confusion and help clarify that “High Quality” designations are not “use classifications”. These designations do not describe a separate “use” of a water body, but rather establish an extra layer of protection for those uses that are present. Therefore, provisions applicable solely to use classifications, such as the downgrading provisions in section 3.1.6 and such as hearings pursuant to section 25-8-207, C.R.S., do not apply to water quality-based designations.

The language of the subsection describing the High Quality 1 designation (now subsection 3.1.8(2)(a)) has been substantially revised and shortened. This change is intended to be consistent with the new criteria for applying a High Quality 2 designation, allowing High Quality 1 to be applied whenever High Quality 2 requirements are met as a minimum and the Commission determines that the extra protection is warranted.

The Commission has established new criteria in section 3.1.8(2)(b) to help clarify which State surface waters should be designated “High Quality 2.” The goal of these criteria is to assure that all waters whose quality exceeds levels necessary to support fishable/swimmable uses are designated High Quality 2, unless the Commission has determined that the “Use-Protected” designation is appropriate, as described in section 3.1.8(2)(c), and below.

The question when “the quality of waters exceeds levels necessary to support” specified uses is subject to considerable interpretation. The quality of any specific water body can vary substantially throughout the year, and, at any given time, can vary substantially among the wide range of pollutants of potential concern. The criteria adopted reflect the Commission's judgment as to how the “High Quality” concept should be applied in view of the wide range of factual circumstances that exist in nature.

Specific criteria also have been established to specify when waters should be designated “Use-Protected,” in accordance with the new hybrid approach.

**b. High Quality 2 designation criteria**

The previous classification provisions contained only a very general statement as to when a High Quality 2 designation is appropriate. The new criteria are intended to provide more specificity and predictability to this determination, while retaining important flexibility to take unique, site-specific circumstances into account. Three automatic grounds are provided for applying the High Quality 2 designation. The first two grounds represent circumstances in which the Commission has determined that the extra layer of protection provided by an antidegradation review is always appropriate. The third automatic ground is a strictly water quality-based test of whether the waters in question are “high quality.” This test is somewhat conservative in terms of applying the High Quality 2 designation in that it requires existing quality to be better than “table values” for each of 12 key parameters. These specific parameters have been selected from Tables I, II and III as those which have a significant likelihood of being present in some Colorado waters at background levels (not influenced by point source discharges) above the table values. The Commission intends that the division should exercise its best professional judgment to determine what is representative data on a case-by-case basis. While any specific test is necessarily somewhat arbitrary in terms of the wide variety of conditions that exist in nature, the Commission believes that a predictable test is a helpful and necessary administrative tool.

In addition to the three automatic grounds, the Commission has established a discretionary basis for applying the High Quality 2 designation whenever special reasons are present to provide the extra protection of the antidegradation review for specific waters. For example, after considering all of the relevant facts in a particular case, the Commission could decide that a specific gold medal trout fishery or waters containing state or federal threatened or endangered species warrant this extra protection.

**c. “Use-Protected” designation criteria**

These criteria have been added to provide a predictable basis on which the Commission can determine when certain waters should be designated in advance as waters to which the antidegradation review will

not apply. Three automatic grounds are provided for this designation. The first ground is definitional. Under the revised descriptions of the aquatic life classifications that are being adopted concurrent with these changes, waters classified aquatic life class 2, or recreation class 2 and warm water aquatic life class 1, do not have quality “higher than necessary to support primary contact recreation and propagation of fish, shellfish, and wildlife.” (Note that waters classified cold water aquatic life class 1 and recreation class 2 do not automatically qualify for the use-protected designation. This is because the Commission recognizes that in many instances where this combination of classifications is present, the recreation class 2 classification is based on physical limitations to primary contact recreation, rather than on poor water quality.)

The second ground for this designation is a strictly water-quality based test. In order to avoid too liberally excluding high quality water resources from the antidegradation review without case-specific information, the test requires that three or more of the listed 12 parameters must have quality worse than table values to apply the “Use-Protected” designation on this basis. Note, however, that for waters left in the middle category (no High Quality or Use-Protected designation), the presumption that an antidegradation review is required is overcome at the time of the case-specific review if only one parameter likely to be adversely impacted by a particular activity has worse quality than required by table values.

The third automatic ground for this designation is where the current quality is maintained better than standards only because of dischargers' treatment efforts. The Commission believes that this provision is appropriate, because in the absence of such a provision some dischargers may have a disincentive to treat to the highest levels possible, for fear that their success could result in a High Quality designation and, in turn, more stringent discharge permit requirements.

Finally, the Commission also has established two separate discretionary grounds for applying the “Use-Protected” designation. First, the designation may be applied where the Commission determines that due to the likelihood that substantial, new or expanded development will occur, it is unlikely that economically, environmentally and technologically reasonable water quality controls will be able to maintain the quality of particular waters above standards. The Commission intends that this basis for designation would be applied cautiously, only when pending development proposals are substantial enough, along with the existing development, if any, to provide a firm basis for determining that degradation of the waters in question is necessary. However, the Commission believes that when such circumstances are present, for administrative efficiency it is appropriate to apply this designation in advance rather than require each activity to undergo a separate antidegradation review.

The second discretionary basis for applying this designation is where the quality of the waters in question is limited by substantial pollution from substances other than the 12 parameters listed for the quantitative water quality test discussed above. The Commission anticipates that the application of this basis for designation is likely to be limited, but believes that this option should be provided to assure adequate flexibility.

**5. Antidegradation Review (section 3.1.8(3))**

**a. Applicability provisions**

The Commission has determined that the antidegradation review should apply to all regulated activities with new or increased water quality impacts that may degrade the quality of reviewable waters (as defined by the antidegradation rule, applying the hybrid system). The Commission has clarified that “regulated activities” currently includes those requiring NPDES permits or section 401 certifications. The Commission has retained the flexibility for the regulation to apply to other types of activities, e.g. nonpoint sources, if such activities are addressed by control regulations in which the Commission has determined that application of the antidegradation review requirements is appropriate. This approach recognizes the status of current regulatory efforts, but provides the flexibility for those to be expanded as necessary in the future.

The regulation also clarifies that the antidegradation review is conducted with respect to activities with "new or increased" water quality impacts. The review is intended to limit future degradation and is not intended to be applied as a means to require remediation of prior impacts. For example, only increased point source loadings above those levels already permitted shall be subject to an antidegradation review.

The Commission also had added language to section 3.1.8(3)(a) stating its intent that the antidegradation review be coordinated or consolidated with other regulatory reviews whenever possible. The Commission recognizes that many new projects already face substantial regulatory hurdles. Any procedural steps that can be taken to minimize the regulatory burden, while still providing the necessary substantive environmental protection, should be encouraged.

**b. Division and Commission roles**

The Commission has decided that antidegradation review responsibilities should be shared between the Commission and the Division. It is appropriate for the Division to make the initial determination whether a particular activity involves "significant degradation" , since this is largely a technical analysis. In addition, although it involves more than a mechanical, technical analysis, the Commission has decided that on balance it is preferable for the Division to have the initial responsibility for the determination whether the degradation is necessary to accommodate important economic or social development in the area in which the waters are located. Several parties recommended that this latter determination be made in the first instance by the Commission. The Commission believes, however, that requiring it to hold a hearing with respect to every such determination may be an unnecessary additional burden in the permitting or approval processes to which regulated activities are subject. Especially considering that the Commission's agenda typically is filled up several months in advance, significant delays could result from this approach. In many instances where an antidegradation review determination is not subject to substantial controversy, considerable time may be saved by delegating authority for this initial determination to the Division.

At the same time, the Commission has provided for de novo review of the Division's determinations by the Commission. When significant controversy exists, this provides for essentially the same level of Commission input into the antidegradation determination as if the Commission were responsible for the determination in the first instance. The Commission believes that on balance the adopted approach is likely to save regulatory resources for both activity proponents and the Commission, while not significantly changing the level of effort required from the Division, since it would be involved in advising the Commission even if it did not have decision-making authority.

The Commission discussed whether its involvement in the antidegradation review process, with respect to activities requiring a discharge permit, might run afoul of the "conflict of interest" provision in section 304(i) of the federal Clean Water Act. The Commission believes that it does not. The result of the Commission's involvement in the antidegradation review process is a determination of which water quality standards (i.e. existing quality v. specific numeric standards) will apply in a particular fact situation. The resulting standards are then used in drafting a discharge permit, but the Commission itself is not "approve(ing) permit applications or portions thereof." The impact of the Commission's antidegradation review decisions on an individual discharger is no more direct than when the Commission adopts ambient water quality standards on any single-discharger water segment in the State.

**c. Significance criteria**

Although virtually any impact on a water body could theoretically degrade the water, the Commission believes that any practical antidegradation policy must focus on the presence of "significant" degradation. If degradation is insignificant, it would not be reasonable to devote substantial administrative and private resources to prevent the degradation. This approach of screening insignificant degradation out of the antidegradation review process is supported by EPA in guidance documents that it has provided to the Commission. Therefore, the criteria set forth in the regulation are designed to screen out insignificant impacts. These criteria have been structured in an effort to take cumulative impacts into account.

Establishment of a specific dividing line between “significant” and “insignificant” degradation is necessarily somewhat arbitrary. However, establishing some dividing line is necessary for purposes of predictability and administrability. From the evidence submitted the Commission believes that the specific criteria adopted are appropriate from a technical standpoint to assure that any substantial new degradation will be subject to the full antidegradation review process.

In addition to the specific significance tests set forth in section 3.1.8(3)(c)(i)–(iv), the regulation provides an additional significance screen for waters designated High Quality 2 due to the presence of exceptional reasons for extra protection. For these waters, degradation will be considered insignificant if there is no adverse impact with respect to the specific reasons for the high quality designation. For example, for a proposed project on a segment designated high quality due to threatened or endangered species, in appropriate circumstances the U.S. Fish and Wildlife Service may issue a “no jeopardy” biological opinion or a biological opinion that identifies potential jeopardy based solely on non-water-quality impacts, as a result of section 7 consultation under the federal Endangered Species Act. The Division should determine that such an opinion demonstrates no adverse impact with respect to the threatened or endangered species. Therefore, such a project would be considered not to result in significant degradation and no further antidegradation review would be required. Where the U.S. Fish and Wildlife Service has specifically addressed threatened and endangered species protection with respect to a proposed project, there is no need for the antidegradation review process to require an additional analysis of this issue, for streams subject to antidegradation review solely to protect such species.

The “mitigation” concept that is incorporated into the determination of “significant degradation” is intended to encourage a practical approach to water quality protection. If anticipated impacts are offset by substantial water quality-enhancing mitigation measures, the Commission could find that the net effect of a proposed activity would be insignificant degradation. For example, in some circumstances an activity could result in lowering the water quality for two or three parameters by an amount that would not be deemed insignificant pursuant to the criteria set forth in the regulation; however, in such circumstances any impact on classified uses of the segment may be largely hypothetical and relatively minor. If an applicant incorporates into a project water quality-enhancing mitigation measures for the same water segment, such as substantial habitat improvement measures, it may be reasonable to conclude that the net effect of the activity is no significant degradation.

Note that the determination of whether an activity will result in significant degradation takes into consideration all new or increased water quality impacts from the activity. Some parties proposed that only the impacts of pollutant discharges be considered. The language adopted allows the impacts of hydrologic modifications also to be considered. The Commission has addressed the issue of potential interference with the exercise of water rights by providing in section 3.1.8(3)(d)(iii) that no project alternatives that would be inconsistent with section 25-8-104 of the Water Quality Control Act would be deemed “available.” Therefore, no project proponent would be required to implement alternatives that would be inconsistent with the protection provided by that statutory provision.

In addition, note that the potential impact on small water development projects is limited in part by the fact that only projects requiring an individual section 404 permit need a section 401 certification. Projects that qualify for a section 404 exemption or nationwide permit do not require a section 401 certification, and therefore are not subject to the antidegradation review requirements.

**d. “Area in which the waters are located”**

A wide range of proposals for interpreting this language was submitted to the Commission. The Commission believes that it is appropriate to include all areas directly impacted by a proposed activity in the review. For projects that affect multiple basins, this should assure that input is received from each affected area. The Commission decided that defining “area” to always include the entire State would be too broad. For example, some relatively small new developments may not be “important” from a statewide perspective, but may be very important to a local region.

The provision as adopted also will help accommodate the language of EPA's water quality regulations with the established Colorado water rights system, which authorizes transbasin water transfer. For water diversion projects, the “area” would include both the basin from which the diversion occurs and the area in which the water use will occur. A narrower definition of “area in which the waters are located” could essentially prohibit transbasin water transfers from affected streams, whenever significant degradation would result from such activities. Moreover, these activities would be restricted even though other activities with identical water quality impacts (but with economic benefits centered in a different location) would be allowed to proceed. There does not appear to be any basis in the federal Clean Water Act for such a non-water-quality-based, land use policy distinction. In fact, such an interpretation would appear to run directly counter to the section 101(b) recognition of states' “primary responsibilities and rights ... to plan the development and use ... of land and water resources” while protecting water quality.

**e. “Important economic or social development”**

Implementation of the antidegradation rule requires some determination of whether a particular proposed activity is important economic or social development. The Commission intends that the case-by-case determinations regarding this issue will take into account all available information and will recognize that the primary responsibilities and expertise of the Commission and the Division are not in making land use decisions that assess the importance of specific development. While local land use decisions would not be binding on the antidegradation determination, the Commission believes that such decisions should be given substantial weight.

The Commission also intends that the determination of importance will be based on the net impacts of a project, after considering both positive and negative impacts. The Commission anticipates that in many instances if there is no information presented to the contrary, the Division will appropriately assume that the proposed development in question is “important.” In specific instances, public comment could lead to a contrary conclusion. For example, the people in the area of a proposed development could feel that the jobs and other benefits associated with the development are not important to them compared to the importance of protecting the quality of a local water resource.

While acknowledging the primary local role in land use planning, the Commission notes that in some circumstances there may be a dispute regarding which local governmental entity's land use determinations should take precedence. That issue is beyond the scope of these regulations and no attempt is made to resolve it here. Rather, based on all the evidence submitted the Division and, if necessary, the Commission will simply have to decide on a case-by-case basis which local land use determinations are “applicable”.

**f. Necessity of degradation**

The determination whether degradation is necessary is to be made by examining whether any less-degrading alternatives are available. The Commission has attempted to circumscribe the range of alternatives considered in several respects. First, alternatives must be economically, environmentally and technologically reasonable. The Commission does not intend by this regulation to force the application of untested new technologies. Second, available alternatives are limited to those that would accomplish the proposed activity's purpose. So long as a project has passed the “important development” test and reached this stage of the review, the “no-action” alternative (i.e. not proceeding with the project) will not be considered an available alternative. Third, in order to avoid undue impact on water rights, the Commission has provided that any alternative that would be inconsistent with the provisions of section 25-8-104 will not be considered “available”.

Finally, the Commission has chosen to focus on available “water quality control alternatives.” While this term is not specifically defined in the regulation the intent is to focus on alternatives directly related to protecting water quality—e.g. different treatment techniques, different discharge locations, applications of additional best management practices, or process changes that improve discharge quality. It is not the Commission's intention that activity proponents would have to examine completely different types of projects than those originally proposed.

Substantial concern was expressed in comments submitted regarding the additional burden placed on project proponents by establishing an alternatives analysis requirement. The Commission does not intend that this requirement would constitute a major additional burden in most instances. Alternatives analysis is standard engineering practice when planning a new project. New domestic dischargers already are required to undertake an alternatives analysis in the site application process. Projects that require a section 404 permit are already subject to Corps of Engineers and EPA requirements to consider alternatives (see, e.g., 33 CFR section 320.4(a)(2)(ii) and 40 CFR section 230.10(a)). Projects subject to federal NEPA requirements already are faced with an alternatives analysis requirement that goes substantially beyond that required here. The Commission intends that the alternatives analysis for antidegradation review purposes should be coordinated with any such other reviews to the extent possible to avoid unnecessary duplication. So long as a reasonable effort has been made to assess less-degrading alternatives, in many circumstances these other reviews may be sufficient to satisfy the antidegradation review requirements.

The Commission also has included in this section a general list of factors that the Division is directed to consider in making case-by-case determinations whether potential alternatives are economically reasonable. The proposal for this hearing included a more specific test of economic reasonableness. Based on the comments submitted, it appears that it is not possible at this time to formulate one simple test that will yield an appropriate determination in all circumstances. Therefore, the Commission has decided to retain flexibility, while providing some guidance as to the criteria it will apply. If experience demonstrates that more specific criteria are workable and helpful, the regulation can be revised at a later date. Although the Division does not maintain an economist on its staff, the Commission notes that the Division has prior experience with implementing an economic reasonableness concept, especially in the context of certain discharge permit variances, which are no longer available following the adoption of Senate Bill 83 in 1985.

**6. Review of Individual Basins**

The Commission intends that these revised antidegradation provisions will generally be applied to individual basins by assessing the appropriateness of water quality-based designations during the next round of triennial reviews. However, the Commission intends that the Division should recommend the establishment of water quality-based designations for a particular water segment prior to the next triennial review whenever (1) the Division believes the water body should be designated High Quality under the revised criteria and (2) the Division is aware of proposed development activities that could significantly degrade the water body in question prior to the next triennial review. Such circumstances warranting an “expedited” review also could be brought to the Commission's attention by the public. Of course, under the hybrid approach, the antidegradation review requirement will apply in some situations without reclassification.

In conducting reviews and applying this revised system in classification hearings, the Commission intends that a determination will first be made as to what use classifications and numeric standards will apply to a water body under the Basic Standards and Methodologies provisions in effect as of July 31, 1988. The determination whether any water quality-based designations are appropriate would then be made with respect to these new standards.

**7. Intergovernmental Coordination and Public Participation**

At least two parties to the hearing proposed that local water quality planning agencies should have a formal role in the antidegradation review process. In addition, EPA's antidegradation policy requires that such reviews satisfy intergovernmental coordination and public participation requirements. The Commission has determined that there is no need to adopt special provisions in the antidegradation section of the regulation addressing such input.

The Commission intends in a separate proceeding to revise its Procedural Regulations to establish specific provisions regarding intergovernmental coordination and public participation with respect to the antidegradation review process. Prior to such additional rulemaking, the Commission requests the

Division to notify the Commission of the procedures that it will apply to antidegradation reviews on an interim basis, to assure that adequate intergovernmental coordination and public participation occurs.

**FISCAL IMPACT STATEMENT**

The revised antidegradation provisions will require an increased expenditure of public and private resources during the next round of triennial reviews of surface water quality classifications and standards, to assess whether adoption of water quality-based designations is warranted pursuant to the new “High Quality” and “Use-Protected” criteria. However, the magnitude of this impact may not be substantial. The information requirements for determination of water quality-based designations should not differ substantially from those required for determining appropriate use classifications. The cost associated with collection of data to determine, for example, the appropriateness of an aquatic life classification and associated standards should not differ from that of determining the suitability of a stream for a high quality designation.

To the extent that additional streams are subject to antidegradation reviews as a result of these changes, an additional expenditure of public and private resources will be required. The review process will require additional Division staff time. The magnitude of these impacts can not be quantified at this time, since the exact number of activities that will be subject to antidegradation reviews also can not be specifically quantified. However, the Commission has attempted to assure that such reviews will not constitute a major additional burden in most instances, by establishing the “significant degradation” screening criteria and by attempting to establish reasonable parameters on the alternatives analysis requirement.

No major adverse fiscal impact is anticipated as a result of the substantive application of the antidegradation review requirements. The Commission has attempted to develop an antidegradation implementation process that assures a demonstration that degradation is necessary before it is allowed for high quality streams, while not precluding additional important development where such degradation is necessary. There could be a fiscal impact to a specific project if the Commission finds that it does not constitute “important development.” With the Commission's recognition of the primary local government land use planning role, it is unlikely that a project would be excluded on this basis except in rare instances. Absent such a finding, a project could be denied under the revised regulation only if there is a finding that there are economically, environmentally and technologically reasonable alternatives available but the project proponent refuses to implement such alternatives.

The new antidegradation provisions will result in new, unquantifiable benefits to the general public from increased protection of Colorado's high quality water resources. While these benefits are unquantifiable, the Commission believes that they may be substantial in preserving the current quality of life in Colorado and preserving Colorado's national image as a state with high quality natural resources.

PARTIES TO MARCH, 1988 HEARING

1 AMAX Inc.
2. Colorado Water Congress
3. Metropolitan Denver Sewage Disposal District No. 1
4. Eastman Kodak Company
5. Colorado Mining Association
6. City of Colorado Springs
7. North Front Range Water Quality Planning Association
8. Metropolitan Water Providers
9. Rocky Mountain Oil and Gas Association (RMOGA)
10. Amoco Production Company
11. Environmental Defense Fund
12. Northwest Colorado Council of Governments (NWCCOG)
13. City & County of Denver Board of Water Commissioners
14. Adolph Coors Company (Coors)
15. Northern Colorado Water Conservancy District and Municipal Subdistrict
16. Sierra Club and The Wilderness Society

17. Southeastern Colorado Water Conservancy District (Southeastern District)
18. CF&I Steel Corporation (CF&I)
19. Umetco Minerals Corp. (Umetco)
20. Martin Marietta Corp.
21. Shell Oil Company
22. Cotter Corporation
23. Division of Wildlife
24. Union Oil of California
25. City of Broomfield
26. Trout Unlimited

## 31.24 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE (1988 REVISIONS-MISCELLANEOUS ISSUES)

The provisions of sections 25-8-202(1)(a),(b) and (2); 25-8-203; 25-8-204 and 25-8-207; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with sections 24-4-103(4) and 24-4-103(8)(d) C.R.S., the following statements of basis and purpose and fiscal impact.

**BASIS AND PURPOSE:**

### A. TEMPORARY MODIFICATIONS

Several changes have been adopted to the temporary modification provisions in section 3.1.7. Several of these changes were recommended by EPA, to ensure compliance with EPA's water quality standards regulations. The Commission agreed to delete certain language relating directly to taking the availability of public and private funds into account in granting or determining the duration of a temporary modification. However, the Commission has added new language providing that the need for time to take the necessary actions to come into compliance with an underlying standard will be taken into account in deciding whether to grant temporary modifications. This provision is meant to take into account the practical realities of implementing new treatment or other control measures, while at the same time assuring reasonable progress toward the improvement of water quality where existing conditions are correctable.

In addition, the Commission has added new language providing that temporary modifications will have a definite expiration date, while retaining flexibility as to the duration of specific temporary modifications. The purpose of this change is to avoid the possibility of a temporary modification simply remaining in place indefinitely without close reexamination, while retaining the flexibility to respond to individual circumstances. For example, the time that it will take to implement corrective measures, as well as the timing of discharge permit expiration and renewal, may be taken into account in determining the appropriate duration of a specific temporary modification.

### B. USE ATTAINABILITY ANALYSIS

EPA recommended that new language be added to the regulation stating a requirement that a “use attainability analysis” be conducted in certain instances to assess the attainability of “fishable/swimmable” uses. The Commission has added language to section 3.1.6(3)(a) requiring that a use attainability analysis be conducted in appropriate instances, and has added a definition of this term to the regulation (section 3.1.5(25)). The Commission declined to make several changes relating to this issue recommended by EPA. For example, EPA recommended that the definition of “beneficial uses” be expanded to differentiate among existing uses, designated uses, and attainable uses. The Commission decided that these changes were unnecessary because there has not been a problem with the current definition, and EPA's changes may generate confusion.

The Commission is aware that certain guidance documents and technical support manuals are available from EPA that may assist in performing use attainability analyses. However, to preserve flexibility, the Commission declined to reference any such specific documents in the regulation. A full biological, chemical, and physical assessment is not a necessary minimum requirement for each and every use attainability analysis. Only those evaluations necessary to determine the attainability of a use for a particular water body need be performed.

In addition, the Commission rejected EPA's recommended change to the definition of “water quality standard.” EPA recommended that “standard” be defined to refer both to a designated use and related water quality criteria. In Colorado, the established practice is that classifications specify the designated use and “standard” refers to what EPA calls “criteria.” There is no need for the change recommended by EPA, and it would result in considerable confusion.

The EPA recommended that two additional items be added to the list in section 3.1.6(1) of considerations in assigning classifications. There is no need to adopt the language relating to “waste transport or waste assimilation” because the Commission has never considered adopting such a classification for any Colorado streams. In addition, the requirement that flows resulting solely or principally from effluent discharge be taken into account in classifying ephemeral or intermittent streams would be inconsistent with Colorado's water rights system. Because water rights changes may result in changes in discharge points, it would be inappropriate to rely on effluent flows in classifying streams.

## C. TOXICS CONTROL AND WATER QUALITY STANDARDS

The adoption of new statewide basic standards for organic pollutants was proposed in the notice for this hearing. That proposal is being addressed at a separate hearing scheduled for December, 1988, and action on that proposal will be taken separately at a later date. The Commission revised the introduction language in section 3.1.11(1) to help clarify the application of the narrative basic standards. The Commission rejected a recommendation by EPA that this Regulation reference a separate policy for implementation of the narrative “free from toxics” standards. The Commission has scheduled a separate hearing to consider the adoption of biomonitoring regulations relating to the “free from toxics” standards.

## D. GROUND WATER REFERENCES

Because the Commission has adopted separate Basic Standards for Ground Water (3.11.0), the Commission has generally deleted references to ground water in this Regulation. In addition, the name of the Regulation has been changed to “The Basic Standards and Methodologies for Surface Water.” A few references to ground water were retained, where ground water quality is a relevant factor in determining appropriate surface water classifications and standards. In addition, as provided in sections 3.1.1 and 3.1.11, until issues relating to proposed new statewide ground water standards for organic pollutants and radioactive materials are resolved following a December, 1988 hearing, certain basic standards set forth in section 3.1.11 will continue to apply to State ground waters.

## E. LOW FLOW CRITERIA

Section 3.1.9(1) has been revised to change the low flow criteria used for permitting and other purposes. The revised criteria are based on the “biological” approach of establishing a 3-year recurrence interval for water quality standards exceedences, to allow adequate time for aquatic life to recover. This biologically based method is an empirical approach recommended by EPA based upon the available historical data. One example of how to calculate an empirically based flow is contained in “Technical Guidance on Stream Design Flow for Steady-State Modeling,” USEPA (1986). This approach is preferable to the prior “7Q10” low flow criterion, which has no biological basis. The revised criteria preserve flexibility to determine on a case-by-case basis the best way to calculate low flows meeting these requirements, depending on the data available in a specific case.

The revised low flow criteria will be applied in conjunction with the new frequency and duration provisions added to the regulation. (See the discussion in the following subsection of this Statement of Basis and Purpose.) This overall approach will provide flexibility for the Division and permittees in the permitting process to assure that water quality standards are met during all appropriate periods, whether resulting from, e.g., flow, pH, or temperature conditions. The second sentence of section 3.1.9(1) also provides flexibility for the use of periodic low flows whenever warranted due to seasonal variations in critical parameters, such as pH or temperature.

The Commission deferred for later discussion the proposal by the Denver Board of Water Commissioners that certain future water uses be taken into account in calculating a low flow, since the future actual use of conditional water rights often is unpredictable. The Commission believes that this type of proposal warrants further consideration in the future, when it can be more fully and directly analyzed. A Colorado Springs proposal to add language stating that there is no guarantee of low flows used in permits was rejected because it presents a legal issue beyond the scope of this Regulation. The Commission notes that section 25-8-104 precludes the Commission and Division from requiring minimum stream flows.

The Commission has also added a new section 3.1.14(8) to clarify that these revised low flow criteria are to be used in the discharge permitting process.

## F. FREQUENCY AND DURATION PROVISIONS

Language has been added to section 3.1.7(1)(b) to state that numeric water quality standards will include appropriate averaging periods and frequencies of allowed excursions. Averaging periods are specified in the definitions of “acute standard” and “chronic standard” (sections 3.1.5(2) and (7)), in section 3.1.16(1) and in Tables I, II and III.

The Commission declined to add language to section 3.1.16(1) stating that discharge permit limits are to be based on the more stringent of an acute or chronic standard. Generally, effluent limitations based on chronic standards will be more stringent than those based on acute standards. For now, any exceptions to this rule are to be dealt with by the Water Quality Control Division on a case-by-case basis, using best professional judgment. It is anticipated that this issue will be addressed further in a wasteload allocation/total maximum daily load guidance document being developed by the Division.

Frequency of allowed excursions is addressed in section 3.1.7(1)(b). The new low flow criteria in section 3.1.9(1) also are consistent with these averaging period and frequency of excursion provisions. New section 3.1.14(8) assures that these provisions will be implemented in translating water quality standards into discharge permit effluent limitations. The Commission believes that these provisions will help clarify the proper interpretation and application of water quality standards.

## G. USE CLASSIFICATIONS

The introductory language of section 3.1.13 has been revised to clarify the applicability of the use classifications described in that section. The reference to ground water has been deleted. Consistent with the Water Quality Control Act, the language now specifies that these classifications may be applied to any State surface waters except those in ditches and other manmade conveyance structures. The Commission does not intend any change in its prior practice of applying use classifications to rivers, streams, lakes and reservoirs.

The aquatic life use classification descriptions have been substantially revised. Definitions of “cold water biota” and “warm water biota” have been added to section 3.1.5 to help implement these revised classification descriptions. The changes are intended to more clearly and accurately describe the distinctions that are intended by the Commission among the various aquatic life classifications.

The Commission intends the reference to “diversity” of species to be general, with the appropriate means of assessing diversity to be determined on a case-by-case basis. This reference is not intended to rely on

any specific aquatic diversity index. The Commission also notes that a proposal by the Colorado Mining Association to adopt a “stocked segment” qualifier was rejected as unnecessary and potentially confusing. The Commission already has flexibility under section 3.1.7(1)(b)(iii) to take site-specific circumstances into account in determining appropriate numeric standards.

Although existing classifications will be reviewed for consistency with the new aquatic life classification provisions during the next round of triennial reviews, the Commission does not anticipate that wholesale revision of existing aquatic life classifications throughout the State will be necessary.

The previous domestic water supply class relating to ground water has been deleted, since ground water classification is now addressed by The Basic Standards for Ground Water. Also, the previous high quality water classification provisions have been deleted here, since they have been moved—in a revised form—into section 3.1.8.

## H. SECTION 25-8-207 IMPLEMENTATION

Both procedural and substantive provisions regarding hearings pursuant to section 25-8-207, C.R.S., have previously been located in the Commission's Procedural Regulations. In response to a recommendation made at the July, 1987 triennial review hearing, the Commission has added the substantive provisions relating to “section 207 hearings” to this Regulation (section 3.1.6(3)(b)), and has simultaneously deleted the corresponding provisions from the Procedural Regulations. The Commission also has added several clarifying revisions to these provisions, in part to make the language more consistent with that in the statute. In addition, the Commission has added language to section 3.1.6(2)(b) to clarify that in appropriate circumstances revisions to classifications pursuant to a “section 207 hearing” should not be considered downgrading.

## I. INNOVATIVE SOLUTIONS OR MANAGEMENT APPROACHES

The Commission seeks to encourage innovative solutions and management approaches to achieve compliance with water quality standards. A new subsection 3.1.14(5) has been added to clarify that such techniques may be incorporated into discharge permits to achieve compliance with standards. In addition, new language in section 3.1.3 notes that, where appropriate, control regulations can be adopted to require such techniques.

## J. MISCELLANEOUS WATER QUALITY STANDARDS REVISIONS

### 1. Table III, Footnote (3)

The new table values for metals contained in Table III are based on equations that are dependent on hardness. Footnote (3) specifies how to select hardness values for use in the equations. Footnote (3) as previously adopted (relating to use of the lower 25th percentile of hardness values) has resulted in some confusion regarding its application. The revised footnote is intended to clarify selection of an appropriate hardness value, and to specify that a regression analysis may be used to select hardness values in appropriate circumstances.

The phrase “representative regional data” will need to be interpreted on a case-by-case basis. It is intended to provide flexibility to use data from adjacent streams or geographically and hydrologically similar streams in appropriate circumstances.

The restrictions on use of regression analysis—use of the lower 95 per cent confidence limit and prohibiting extrapolation beyond the data base—are intended to help minimize the risk of developing a regression-based hardness value that may be unrepresentative of actual conditions. The adopted language also is intended to preserve flexibility for the Division to determine where regression analysis may be inappropriate, requiring use of an alternative site-specific method. As one example, regression analysis may be inappropriate where there is a poor statistical fit.

**2. Change in Bacteria Standard**

The Commission considered at the hearing whether the fecal coliform standard currently contained in Table I should be changed to a standard based on a different type of bacteria. Recently available EPA criteria documents suggest that standards based on E. coli or enterococci may be appropriate. The Commission declined to make any change in the standard at this time. The major concerns expressed regarding the proposed change were the increased cost of analysis and the lack of a standard analytical methodology for E. coli. The Commission intends to give further consideration to a possible change in the indicator bacteria as more information becomes available to address these concerns. The Commission has requested the Division to provide a status report regarding these issues to the Commission in approximately one year.

**3. "Aerobic" Standard Clarification**

Table I has previously specified that dissolved oxygen conditions be maintained as "aerobic" for several classifications. This standard was imprecise and led to some confusion. Therefore, a specific numeric value for dissolved oxygen has been added to replace the previous "aerobic" standard. The intent of the 3.0 mg/l criterion is to reduce the potential for anaerobic conditions downstream from discharges to segments not classified for aquatic life.

**4. Fluoride Table Value**

The table value for fluoride for domestic water supply in Table II has been revised to be consistent with EPA's revised drinking water standards. Consistent with past practice, EPA's "secondary drinking water standard" has been adopted as the table value.

**5. Averaging Period Clarification**

Notations have been added where appropriate to the text and footnotes of Tables I, II, and III to clarify which standards are intended as thirty-day, chronic standards and which are intended as one-day, acute standards. In addition, footnotes 1, 2 and 3 to Table I now specify that certain criteria are intended as one-day or instantaneous maxima or minima.

**6. Table III, Former Footnote (1)**

The Commission has deleted the previous footnote (1) from Table III. This footnote, relating to alkalinity, has not been applied in practice and has created confusion as to its intent and applicability.

**7. Ammonia Values Clarification**

As previously drafted, the new ammonia equations in Table II could under some circumstances result in an acute value that is less (i.e. more stringent) than the chronic value. A clarification has been added to provide that in such circumstances the chronic value would be used as the acute standard.

**8. Table II, Footnote (5)**

Clarifications have been added to the equations contained in Table II, footnote (5) to specify the upper limits for chloride ion concentration for application of the respective equations.

**K. OTHER REVISIONS**

**1. Segmentation Criteria**

A new subsection has been added to section 3.1.6 to specify the criteria used by the Commission in determining the appropriate segmentation of streams and other water bodies for classification and

standard-setting purposes. These criteria are the same as have been used by the Commission for the last several years, and they are simply being added to the text of the Regulation to assure that the public is aware of the Commission's policy in this regard.

**2. Section 3.1.7 Clarifications**

A new subsection has been added to section 3.1.7, to reference the statutorily required considerations in assigning water quality standards. This change was recommended at the July, 1987 triennial review hearing, so that the public will be more clearly on notice of the factors relevant to setting water quality standards.

**3. EPA Guidance Documents**

Several references in the regulation to specific EPA guidance documents have been deleted. While these guidance documents, along with other relevant guidance materials, may be used by the Commission and the Division when applicable, the Commission decided that references to the guidance documents in the regulation are inappropriate, because such reference could be interpreted to suggest that the provisions of the guidance documents are intended to have binding regulatory effect. However, the list of references in section 3.1.16(3) has not been revised, since this list is intended as background information to identify the source of numeric values in Tables I, II and III.

**4. Mixing Zones**

EPA recommended a change to the mixing zone provisions in section 3.1.9(3), to require no acute lethality in the mixing zone. The Commission has adopted changes providing that there shall be no acute lethality in the mixing zone except where there is significant dilution and mixing is rapid. The Commission believes that this change should protect aquatic life while avoiding the need for increased treatment where that is unnecessary to protect the classified uses.

**5. Editorial Changes**

In addition to the substantive changes described above, numerous editorial changes have been made in the Regulation in an attempt to make the Regulation as a whole more readable. Several minor changes were made to conform the overall Regulation with the recent changes to the antidegradation provisions. In several instances terminology has been revised to be more consistent with that in EPA regulations—e.g. changing “areawide” to “widespread” —where the Commission felt that this would minimize unproductive semantic disputes with EPA, while not changing the substantive intent of the State regulation. In addition, several typographical errors in Table III and elsewhere in the Regulation have been corrected.

**FISCAL IMPACT STATEMENT**

The changes taken as a whole are not expected to have major new fiscal impacts over the long run. These changes are in the nature of clarifications and refinements of a system that has already been adopted. It is expected that there will be significant “start-up costs” for both public and private entities, including the Water Quality Control Division, to become familiar with the revised classification and standards system resulting from the combination of these changes and those adopted on June 2, 1987. These costs, which cannot be quantified at this time, would result from any substantial revisions to this system.

It is possible that specific changes may result in marginally less stringent or more stringent standards applying to specific entities, with associated differences in cost of compliance. At this time it is not possible to predict whether the net cost impact on regulated entities will be positive or negative; nor can such impacts be quantified at this time. Overall, the Commission finds that the revisions adopted constitute improvements in the current classification and standard-setting system which will minimize the

potential for over-protection (saving the resources of dischargers) and minimize the potential for under-protection (reducing unwarranted impacts on the State's water quality resources).

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9. Rocky Mountain Oil and Gas Association (RMOGA)
10. Amoco Production Company
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12. Northwest Colorado Council of Governments (NWCCOG)
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14. Adolph Coors Company (Coors)
15. Northern Colorado Water Conservancy District and Municipal Subdistrict
16. Sierra Club and The Wilderness Society
17. Southeastern Colorado Water Conservancy District (Southeastern District)
18. CF&I Steel Corporation (CF&I)
19. Umetco Minerals Corp. (Umetco)
20. Martin Marietta Corp.
21. Shell Oil Company
22. Cotter Corporation
23. Division of Wildlife
24. Union Oil of California
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## 31.25 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1989 REVISIONS)

The provisions of sections 25-8-202(1)(b), (2) and (7); and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

### A. OVERVIEW

The Commission has adopted substantial revisions to the statewide standards for organic pollutants contained in section 3.1.11. The additional standards for organic pollutants, now contained in Tables A, B and C, are based on EPA water quality criteria documents, maximum contaminant levels (MCLs), EPA drinking water health advisories, and EPA Integrated Risk Information System (IRIS) data, which have become available subsequent to the adoption of the original table in 1979. These standards are being adopted in part in response to new requirements in the 1987 amendments to the federal Clean Water Act (CWA) to adopt water quality standards for toxic pollutants, “the discharge or presence of which in the affected waters could reasonably be expected to interfere with” classified beneficial uses. CWA, section 303(c)(2)(B). Although toxic organic pollutants generally are not a major problem in Colorado surface waters at present, the Commission believes that the best policy option is to adopt numerical standards now, to help assure that these pollutants do not become a problem.

The organic chemicals for which standards are being adopted generally are not naturally occurring water quality constituents. Therefore, the Commission has determined that a statewide approach to adoption of water quality standards for these substances is the most efficient and appropriate means of assuring human health and environmental protection in a timely manner. Where there may be naturally occurring

levels of some specific pollutants for which standards are adopted, or where other site-specific factors warrant, the Commission has preserved the flexibility to adopt alternative, site-specific standards, as discussed further below. Considering the federal requirements and the potentially serious adverse impacts from these toxic pollutants, the Commission has determined that the record in this proceeding demonstrates the need for the adoption of these standards.

Recently adopted legislation—Senate Bill 181 in the 1989 session—includes new provisions that apply when the Commission adopts “rules more stringent than corresponding enforceable federal requirements.” Section 25-8-202(8)(a), C.R.S. The Commission interprets these provisions to be inapplicable to this rulemaking, since there are no “corresponding enforceable federal requirements” that establish ambient surface water quality standards in Colorado. Section 303 (c)(2)(B) of the 1987 amendments to the federal Clean Water Act includes a directive that, whenever states revise surface water quality standards, they adopt standards for certain toxic pollutants. However, no federal standards—no enforceable federal requirements—are established for these pollutants. EPA develops water quality criteria, but these are not enforceable standards. Enforceable requirements exist only after states have adopted standards. EPA can adopt standards for a state that fails to act, but this has never occurred in Colorado.

Moreover, even if this section did apply, the Commission finds that the standards adopted are based on sound scientific and technical evidence in the record. This basis is demonstrated in part by the testimony submitted by witnesses for the Division and for EDF, including the underlying analyses and studies referenced therein. The Commission's evaluation of the available information, and its assessment of how this information should be reflected in the standards, is also addressed in the discussion of “Basis for Specific Standards” set forth below. Finally, these standards are necessary to protect the public health, beneficial uses of water, and the environment of the State—in part due to the fact that there are no corresponding enforceable federal requirements. As mentioned above, the Commission believes that the best policy to assure protection of these uses is to adopt uniform, preventive standards. Without such standards in place, waters that have not yet been affected by the discharge or presence of such toxic pollutants may be adversely affected in the future, and protection of their present and future uses would then not be assured. The approach adopted by the Commission attempts to assure protection of uses by initially applying the standards broadly, but at the same time assures economic reasonableness by providing flexibility to revise the standards on a site-specific basis and to take site-specific circumstances into account in determining the need to apply the standards in regulating individual entities. See, e.g., the discussion below regarding “Integration into Discharge Permits”.

Section 3.1.11 also has been revised by deleting several previous references to ground water. Concurrently with these amendments to this regulation, the Commission is adopting similar new provisions in the Basic Standards for Ground Water, 3.11.0 (5 CCR 1002-8). No changes are being made at this time to the radioactive materials standards contained in section 3.1.11, although new language is being added clarifying that alternative site-specific standards may be adopted by the Commission.

Finally, certain corresponding and clarifying changes have been adopted in section 3.1.14, regarding integration into discharge permits.

## B. RELATION OF STANDARDS TO CLASSIFICATIONS

The previous basic standards for organic pollutants in section 3.1.11 applied to all state surface waters, irrespective of site-specific use classifications. The original proposal for this hearing set forth a similar approach for the new standards. After considering the various alternative proposals, the Commission has decided to tie applicability of the new organics standards to established classifications for aquatic life and water supply. Because comprehensive classification of the surface waters of the state has already occurred, this approach should assure protection of appropriate uses.

## C. BASIS FOR SPECIFIC STANDARDS

### 1. Overview:

A wide range of approaches to setting standards for the organic pollutants were considered during the course of this proceeding. These ranged from setting “zero” standards for some pollutants (carcinogens), to setting standards only for chemicals for which MCLs have been adopted, to setting standards based on practical quantitation limits (PQLs).

The standards adopted have been established as interim rather than permanent standards for two general reasons. First, it is clear to the Commission that the development of appropriate numerical criteria to protect various beneficial uses from organic pollutant impacts is a rapidly evolving area that is still very much in flux. For example, there are currently significant differences among the various criteria, advisories, and maximum contaminant levels available for a number of specific pollutants. As new information becomes available and potential conflicts among the various numerical levels are resolved, it may be appropriate in specific instances in the future to adopt permanent standards either more or less stringent than the interim standards being established at this time. However, given the importance of controlling toxic pollutants in the environment, the Commission believes that it is necessary to move forward with the adoption of interim statewide standards at this time, and that the interim standards adopted are reasonable based on the best currently available information.

Second, there is currently substantial uncertainty and concern regarding whether or how a federal antibacksliding policy may apply to any standards adopted at this time. The Commission believes that it is not appropriate for antibacksliding or downgrading restrictions to apply to any subsequent, more lenient, revisions of these standards based on improved general or site-specific information. The fact that these restrictions would not apply to such subsequent revisions is a material assumption upon which the Commission is relying in adopting these statewide standards.

**2. Aquatic Life Standards:**

In addition to these two general motivations for adopting interim standards, the Commission wishes to even more strongly highlight the “interim” nature of the standards being adopted for aquatic life classifications. For standards applied to waters with aquatic life classifications (Table C), the Commission has adopted water quality standards based on toxicity to aquatic life from EPA's “Gold Book.” The principal alternative, which the Commission has chosen not to adopt at this time, would be standards based on “fish ingestion” criteria, which are intended to protect the public from potential adverse health impacts of eating contaminated fish. As a matter of public policy, it is extremely important that fish caught in Colorado streams be safe for the public to eat. However, pending further review of this issue, the Commission believes that adoption of statewide numerical standards based on fish ingestion criteria would be premature at this time.

Therefore, pending further investigation as described below, it cannot be stated that the pollutants in question would “reasonably be expected to interfere with” fish ingestion “uses” on a statewide basis. Rather, the need for such standards can and will be addressed on a site-specific basis where appropriate. Given the established system of site-specific surface water classifications and standards, this can be accomplished practically in the triennial review process for individual river basins. Should a specific situation arise where there was immediate concern regarding such pollutants and fish ingestion, the Health Department would issue appropriate health advisories and work with the Division of Wildlife to insure the area was properly posted. In addition, the desirability of statewide standards can be reassessed over time.

It is the Commission's understanding that the health based 304(a) criteria adopted by EPA are based on regular ingestion of fish by humans over a 70 year lifetime. It is unlikely that these circumstances exist on a statewide basis in Colorado and hence the Commission determined that application of the 304(a) fish ingestion criteria are not appropriate at this time.

The Commission is requesting that the Division staff further analyze this issue for subsequent reassessment on a statewide or site-specific basis. For example, further analysis should be given to the applicability of the assumptions underlying EPA's fish ingestion criteria to the circumstances in Colorado. Are general or site-specific levels of fish consumption in Colorado consistent with EPA assumptions?

Should statewide or site-specific standards that apply modified assumptions be considered? To what extent do heavily-fished streams overlap with those already classified for water supply, resulting in the presence of more restrictive, health-protective standards even without application of the fish ingestion criteria? Do bioconcentration factors require more stringent standards than those to protect water supply? Are certain organic chemicals more of a concern than others with respect to potential impacts in Colorado?

Along with these types of Health Department efforts to examine circumstances unique to Colorado, the Commission anticipates that additional national information regarding fish ingestion criteria for organic pollutants will be developed over the next several years. Taking all such information into account, the Commission intends that the Division staff should raise any possible need for revising the current interim aquatic life standards in subsequent triennial reviews of this regulation, or of site-specific classifications and standards, as it determines appropriate.

In addition to pure public health concerns, Colorado has a strong economic motivation to assure public confidence in the safety of consuming fish from Colorado streams, to protect the recreational fishing industry. If at any point it becomes clear that a real risk to public health could develop, or that the remaining uncertainties make preventive standards the preferable public health policy option, more stringent statewide or site-specific standards may be adopted in the future.

On Table C, several chemical compound families are identified. The Division and Commission considered several options regarding whether or how to set standards for these families, in part because a detection method has not been established for families per se. The detection method for families is essentially the detection of individual compounds within the family. The sum of the concentrations of the individual compounds establishes the family's concentration level. This method is quite cumbersome in many cases. For instance, Polynuclear Aromatic Hydrocarbons are comprised of hundreds of different compounds. At this time, the Commission believes it is more appropriate to not set a standard for an entire family, but rather to set standards for individual compounds within certain families as listed in the EPA Gold Book. The Commission realizes that there are many toxic compounds which are addressed in the Gold Book only as families. However, due to the complexity of the problem, the Commission will defer these to possible additions in updates of this regulation during the triennial review process, as more specific criteria are developed or other options are identified to address this issue.

**3. Water Supply Standards:**

The organic pollutant standards for waters classified for water supply protection have been divided into two categories—Table A for carcinogens and Table B for non-carcinogens. For non-carcinogens, the interim standards are based on MCLs, or lifetime exposure levels derived from the “reference dose” for constituents for which no MCLs have been adopted. Non-MCL standards generally are based on EPA drinking water health advisories or IRIS data. The Commission has determined that this is the best information currently available to derive appropriate criteria for protection of human health from non-carcinogens.

For the Table A carcinogens, the interim standards are again based on MCLs for constituents for which these limits have been developed. For non-MCLs, standards based on the 1 ×t; $10^{-6}$ cancer risk level have been adopted. Recognizing that there is no scientifically “correct” risk level, the Commission has selected this level as a matter of policy, because it believes this is an appropriately conservative and protective level for human health risks.

To determine which specific pollutants to list on Table A, any particular compound was considered to be carcinogenic if it has been classified by EPA as either a Group A (known human carcinogen) or Group B (probable human carcinogen) compound. Compounds classified as Group C (possible human carcinogen), Group D (information inadequate to assess), or Group E (not anticipated to be a carcinogen), were treated as non-carcinogenic and listed on Table B. A few specific compounds classified by EPA as Group B/C were considered carcinogens and included in Table A.

## D. SITE-SPECIFIC STANDARDS

Section 3.1.11(4) clarifies the Commission's ability to adopt site-specific standards to apply in lieu of the statewide standards where appropriate. One such example where this might be appropriate was mentioned above—i.e., where a more restrictive aquatic life standard may be appropriate because adverse human health impacts from fish consumption are demonstrated to be a potential problem on a site-specific basis. Rather than attempt to anticipate all potential factual justifications for different site-specific standards, the Commission has determined that it is most appropriate simply to refer to the standard statutory and regulatory criteria for such determinations.

The Commission believes that because these standards are being adopted without taking site-specific factual circumstances into account, any revised site-specific standards based on such a site-specific analysis should not be considered a downgrading. Rather, this would simply be a determination that different numerical standards are adequate to protect the uses in question. The fact that downgrading criteria would not apply to such circumstances is another material assumption upon which the Commission relies in adopting these statewide standards. Of course, any proposal to remove an existing use classification in a site-specific hearing would be subject to the downgrading criteria.

## E. INTEGRATION INTO DISCHARGE PERMITS

The Commission also has added four new subsections to section 3.1.14. New subsection (9) explains how detection levels are to be used in implementing the new standards, in view of the fact that in many instances the standards are lower (more stringent) than common detection levels. Although the new standards will be used in appropriate circumstances to calculate effluent limitations for discharge permits, the Commission believes that it is appropriate to recognize the limits of current detection technology by clarifying that specified detection levels will be used for purposes of determining permit compliance.

The specific detection levels to be used for these statewide standards are being specified in the regulation. Although this is not the Commission's normal practice, it has determined that this step is appropriate in this instance because the need to comply with very stringent standards for organic pollutants will be new to many regulated entities.

The Commission has decided to rely for now on detection levels based on practical quantitation limits (PQLs) associated with GC-MS laboratory analysis techniques, except where only a GC-based PQL exists. For those compounds which have an MCL as the standard, the corresponding detection method was adopted. The Commission has decided not to require detection to the generally more stringent GC-PQLs in all circumstances, in order to temper the economic impact of this new set of standards. Of course, as scientific knowledge and technology advance, this decision may be reconsidered in subsequent rulemaking hearings. In a few specific instances where national guidance is not available, PQLs have been established based on the Health Department Laboratory's best professional judgment.

One major concern raised by several parties to the hearing concerns the potential application of antibacksliding restrictions to discharge permit requirements resulting from these new statewide standards, should more lenient statewide or site-specific standards be adopted in the future. One of the material assumptions relied on by the Commission in proceeding with the adoption of these standards at this time is that antibacksliding should logically apply to discharge levels actually attained, rather than to more stringent underlying standards or effluent limitations. In other words, the fact that a discharger is achieving a PQL-based compliance threshold for an effluent limitation based on one of the statewide organic standards does not necessarily mean that the more stringent effluent limitation level itself is being attained.

The remaining new subsections of section 3.1.14 provide guidance as to when a specific discharge permit may need effluent limitations or monitoring requirements based on one or more of the organic pollutant standards. The Commission obviously does not intend that all discharge permits will contain effluent limits for all of these constituents. Subsections 3.1.14(10) and (11) establish general criteria to be followed by the Division in determining when such limits are necessary. These criteria are intended to

assure that effluent limits are imposed only for those pollutants that can reasonably be expected to occur in a discharge at levels such that the applicable standards would be threatened or exceeded. The Division's determination could be based, for example, on effluent monitoring results from a particular discharger, or on knowledge that a particular chemical is used in a specific industry's process and may be present in its wastewater at levels which, following discharge, could be inconsistent with water quality standards. Correspondingly, the language in the regulation clarifies that if monitoring data for all probable sources identified demonstrates that a particular chemical is not present at levels of concern, no effluent limitation should be established. The Commission cannot realistically anticipate all factual circumstances that could arise, but rather recognizes that the Division will need to exercise its professional judgment, based on the best information available to it, in making such determinations.

Concern was expressed during the rulemaking process that situations could arise where municipal dischargers violate effluent limitations based on the new organics standards, but where the source of such pollution is difficult or impossible to control through traditional pretreatment programs. For example, it was suggested that if the source of a problem turns out to be widespread use of certain household products, the only practical solution may be a product ban, which cannot feasibly be accomplished by the municipality. Given the uncertainty at present regarding the nature and extent of any such problems that could be identified, it would be premature for the Commission to attempt to specify a particular remedy for such situations in advance. However, the Commission is committed, should such circumstances develop, to taking any actions within its authority to assure that responsibility for and resolution of such problems is addressed in a practical manner. For example, it has been suggested that the Commission could hold a hearing to investigate the source of the problem, and then report its conclusions and recommendations to the Governor and the General Assembly. Finally, the Commission notes that the Division has authority to exercise its enforcement discretion in individual situations in a manner that it determines to be appropriate based on the facts at hand.

New subsection 3.1.14(12) addresses monitoring requirements for pollutants covered by the new organic chemical standards. This subsection is intended to help assure that monitoring requirements for discharges of such pollutants are reasonably related to the potential for the presence of such pollutants in the discharge at levels inconsistent with water quality standards, and that such requirements are imposed to the maximum extent practical on those responsible for the presence of the pollutants. For example, if a specific industrial facility is the only source of a particular pollutant, monitoring of that facility's discharge into a domestic facility's collection system could be substituted for monitoring of the domestic discharger's effluent.

Finally, a general goal of new subsections 3.1.14(10), (11) and (12) is to help assure that the new standards are implemented in a manner that is consistent with the state's pretreatment program. The Commission's intent is to avoid unnecessary, duplicative requirements to the maximum extent practical.

One concept which was raised during the rulemaking process that has been rejected by the Commission was the possibility of adding new “point of compliance” language into this portion of the regulation regarding integration into discharge permits. The Commission believes that this is not necessary at this time and would add potential confusion since “mixing zone” provisions—a related concept—are already addressed elsewhere in this regulation. The Commission's simultaneous adoption of new organics and radioactive materials standards for ground waters in the Basic Standards for Ground Water, 3.11.0, may add a new factual determination that will need to be made in drafting some surface water discharge permits—i.e. What effluent limitations are needed, if any, to assure compliance with ground water standards at their applicable point of compliance, if recharge from the surface water in question is likely? However, this determination does not require additional regulatory provisions in this document.

## F. RELATIONSHIP TO OTHER PROGRAMS

Concerns were raised during the hearing process regarding the relationship of these new statewide organic pollutant standards to environmental standards that might be established under federally-dictated environmental programs. The Commission does not intend to attempt to preempt such programs by the adoption of these standards. To address the one specific program where there appeared to be a potential

for conflict in the surface water context, the Commission has added new subsection 3.1.11(5), relating to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

The Commission also notes that, in accordance with Senate Bill 181, for certain categories of activities these standards will be implemented initially by other state “implementing agencies,” except for use in discharge permits. Section 25-8-202(7), C.R.S. The Commission believes that this system should be efficient and effective. Moreover, if at any time it appears that the other agencies are not taking adequate steps to assure compliance with the standards, the Commission is authorized by SB181 to step back in and take appropriate action.

## G. ECONOMIC REASONABLENESS

The new statewide standards for organic pollutants could have an adverse fiscal impact on any persons discharging such pollutants to state waters. It is impossible to quantify that impact at this time. Such impacts will depend to a large degree on the nature and extent of any of the listed contaminants in dischargers' waste streams. The marginal impact of these amendments also is difficult to quantify since the existing narrative “free from toxics” standards has already been used to establish effluent limitations for organics for some dischargers. In addition, the recently adopted biomonitoring requirements will already require efforts to remove toxics from effluent. Any fiscal impact on nonpoint sources would depend on the nature of any control regulations that the Commission may adopt in the future. However, the Commission believes that in general the cost associated with compliance with the standards will be counter-balanced by the environmental benefits associated with protecting beneficial uses, although these benefits are also impossible to quantify at this time.

The Commission has incorporated several elements into these amendments in an effort to make them as economically reasonable as possible, consistent with providing adequate protection of human health and the environment. Examples of these elements include:

1. Use of MCLs, which are set at levels that take technological feasibility into account, as interim standards for any pollutants for which these levels have been established;

2. Reliance on accepted detection levels as compliance thresholds where the actual standards are more stringent;

3. Adoption of aquatic life interim standards based solely on toxicity to aquatic life, rather than on “fish ingestion” criteria, pending further analysis of that issue;

4. Provisions for adoption of site-specific standards to apply in lieu of the statewide provisions where appropriate;

5. Explicit deference to the federal CERCLA program, which may apply different standards; and

6. Provisions attempting to assure that the new standards do not result in unnecessary discharge permit limitations or excessive monitoring requirements.

Each of these elements is discussed in more detail above, in earlier sections of this statement.

PARTIES TO THE PROCEEDINGS OF THE PUBLIC RULEMAKING HEARING FOR THE BASIC STANDARDS FOR SURFACE WATER

1. Holme, Roberts & Owen
2. Vranesh & Raisch
3. Colorado Mining Association
4. City of Colorado Springs
5. North Front Range Regional Planning Agency

6. Homestake Mining Company
7. Rocky Mountain Oil and Gas Association
8. Amoco Production Company
9. Saunders, Snyder, Ross & Dickson
10. Welborn, Dufford, Brown & Tooley
11. Environmental Defense Fund

## 31.26 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1991 REVISIONS)

The provisions of section 25-8-202(1)(a),(b),(d) and (2); 25-8-203; 25-8-204; and 25-8-501 to 25-8-504 C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

### A. ANTIDEGRADATION

The Commission adopted major revisions to the antidegradation provisions in 1988. The experience gained by the Commission and Division in implementing those provisions since that time indicates that this new structure is generally workable, but that a few refinements would be helpful.

#### 1. Presumptive Review Provisions.

Section 3.1.8(1)(b)(iii) provides that antidegradation review requirements are presumptively applicable to certain waters for which no water quality-based designation has been established. The previous version of this section allowed this presumption to be overcome if existing water quality for one or more parameters is worse than the “table values” set forth in Tables I, II and III. This provision has now been revised to provide that existing quality must be worse than table values for at least three of these parameters in order for the presumptive antidegradation review requirement to be overcome.

This change is being made in part to be consistent with parallel changes that are being adopted in section 3.1.8(2)(b)(i)(C). The previous regulatory provisions resulted in a regulatory “no man's land” for segments where one or two parameters exceed table values. Such segments did not qualify for designation either as “high quality” or as “use-protected” segments. They were presumptively subject to antidegradation review if the appropriate classifications were applicable, although this presumption could be overcome by data showing that as few as one parameter in fact exceeded table values. The Commission now believes that a simpler, more consistent cut-off between two and three parameters of “poor” quality is preferable. The Division has indicated that the previous test excluded from antidegradation review a number of water bodies that generally would be considered to have very good quality water. This was particularly true for a number of streams that were excluded from review on the basis of elevated levels of iron. The impacts of iron on aquatic life uses are uncertain, and the benefit of iron as a water quality standard is more as an indicator of sediment loading.

The Commission recognizes that this revision will marginally expand the number of streams subject to antidegradation reviews. The Commission believes that this expansion is appropriate as a matter of policy, to further the goal of protecting Colorado's existing high quality water resources. Moreover, the Commission notes and is influenced by the fact that the experience gained since 1988 indicates that fears that the new antidegradation review provisions would be used as a tool to stop development in Colorado were unfounded.

The Commission also has deleted the reference in this segment to recreation classifications, so that presumptive review would now be based solely on the presence of an aquatic life class 1 classification. In recent basin-specific hearings, and in other revisions being made in this hearing, the Commission has

based the distinction between recreation class 1 and class 2 classifications on the presence or absence of specific uses, rather than on the presence or absence of water quality consistent with a class 1 classification. Therefore, it now appears that whether a segment is classified recreation class 1 or class 2 is not a good general indicator of the quality of the water in a particular segment. Accordingly, here and in section 3.1.8(2)(c), the references to recreation classifications as a determinant of whether an antidegradation review is required have been eliminated.

**2. Key Parameter Test.**

Section 3.1.8(2)(b)(i)(C) has been revised to provide that waters are to be designated high quality 2 if less than three of the listed parameters exceed table values. The previous version of this regulation required that existing quality for all of the listed parameters be better than table values in order for the high quality 2 designation to routinely apply. The reasons for this change are the same as those described above, with respect to the revisions of section 3.1.8(1)(b)(iii).

**3. Use-Protected Designations.**

The reference to recreation classifications in section 3.1.8(2)(c)(i)(A) has been deleted. See the discussion regarding Presumptive Review Provisions, above.

**4. Public Participation and Intergovernmental Coordination.**

Subsequent to the revision of this regulation in 1988, the Commission revised its Procedural Rules, 2.1.0 (5 CCR 1002-1), to establish procedural provisions regarding public participation and intergovernmental coordination relating to antidegradation review. A new subsection 3.1.8(3)(e) has been added to this regulation to cross-reference those procedural provisions.

**5. Other Proposals**

The Commission considered but rejected proposals to delete subsections 3.1.8(2)(b)(i)(A), (B), and (ii). The result of these deletions would have been to base high quality designations solely on the 12-parameter test in subsection 3.1.8(2)(b)(i)(C). The Commission continues to believe that it is appropriate as a matter of policy to provide the extra layer of protection afforded by antidegration reviews to waters in National Parks, National Monuments, National Wildlife Refuges, and Wilderness Areas, and to designated Wild Rivers. The Commission also believes that the “exceptional reasons” provision in subsection 3.1.8(2)(b)(ii) has proven workable to date. The Commission considered and rejected a proposal to put more specific guidance regarding the application of this latter subsection in the regulation. In determining whether to designate a segment high quality 2 based on “exceptional reasons” , the Commission has in the past considered factors such as:

1. The water supply for the segment is high quality water;

2. Sensitive aquatic life inhabit the segment;

3. The segment is an economically important resource used by a significant number of people for fishing or other recreational purposes;

4. The segment is unique, either by fact of designation by a government body other than the Commission, or by proximity to government preservation areas such as national parks, national monuments, or state parks; and

5. Potential effects of the designation on other uses of the segment.

Factors such as these, or other factors, may be determined to be relevant to high quality designation decisions in the future. However, until more experience with application of this subsection is acquired, the Commission believes it would be premature include such specific criteria in the regulation.

The Commission also considered but rejected proposals to make several other changes to the antidegradation provisions. The Commission does not believe that it is necessary or appropriate to further define “available representative data” at this time. Exercise of case-by-case best professional judgment will continue to be necessary in applying this concept. The Commission does agree that the Division should be encouraged to explain the basis for its application of this concept in specific situations (e.g. is an extrapolation from data in other adjacent or similar segments being relied upon?) as early as possible in individual rulemaking hearing proceedings.

The Commission also declined to make changes in the significance determination, economic reasonableness and public participation provisions, or in the provisions defining the applicability of antidegradation provisions to regulated activities. The substance of the public participation provisions is set forth in the Commission's Procedural Rules and was not at issue in this hearing. With respect to other provisions, the Commission does not believe that there is sufficient evidence available at this time that there is a need to revise the provisions adopted in 1988.

## B. STATEWIDE NUMERICAL STANDARDS

### 1. Organic Chemicals.

In 1989, the Commission adopted certain interim organic pollutant standards, applicable to water segments statewide based on the presence of domestic water supply or aquatic life classifications. Several revisions and additions to those interim standards are now being adopted. In general, the primary purpose of these changes is to provide a more thorough system to assure protection of Colorado's water resources with respect to potential adverse impacts from organic chemicals. In addition, these revisions should address remaining questions regarding Colorado's compliance with the requirements of section 303(c)(2)(B) of the federal Clean Water Act.

One change adopted is to combine previous Tables A, B, and C into a new, consolidated Basic Standards for Organic Chemicals Table. The Commission believes that this format will be easier to read, and helps to assure elimination of potential inconsistencies between the separate tables.

#### a. Fish and Water Ingestion Standards.

The Commission has added to the new consolidated Basic Standards for Organic Chemicals Table additional organic chemical standards for class 1 aquatic life water segments. These standards have been added to help ensure protection of human health, taking into consideration the fish ingestion or consumption pathway. In 1989, the Commission declined to adopt such standards for all state waters classified for aquatic life (class 1 or class 2). The Commission still believes that that blanket application is unnecessary. However, the Commission does believe that presence of a class 1 aquatic life classification is in general a good indicator of streams where significant fishing may occur.

In 1989, the Commission also questioned whether the assumptions underlying EPA's criteria regarding fish ingestion were appropriate for use in Colorado. EPA's criteria assume an average consumption of 6.5 grams of fish per person per day. The evidence indicates that where other states that have adopted similar standards have used a different average consumption rate, they have generally assumed a consumption rate three times that used by EPA. In the absence of resources to do a more exhaustive analysis of Colorado fish consumption habits, the Commission believes that use of the EPA assumption is a reasonable policy choice.

The Commission does not believe that the evidence indicates that the pollutants contained in the Basic Standards for Organic Chemicals Table are currently present at levels of concern for most Colorado

waters. By adopting these standards at this time, the Commission intends to help implement a preventive system to assure that problems do not develop in the future. The experience of other states indicates that issuance of health advisories regarding consumption of locally caught fish can have a significant negative impact on the recreational fishing industry. It is the Commission's goal to prevent such circumstances from developing in Colorado to the maximum degree possible.

In taking this step, the Commission also is influenced by the experience to date in implementing the organics standards adopted in 1989. During the proceeding that led up to the 1989 action, substantial concern was expressed that adoption of standards for a long list of organic chemicals would result in substantial and unnecessary monitoring expenses for the regulated community. The Commission attempted to address this concern by the adoption of section 3.1.14(10), which instructs the Division to require monitoring only where toxic conditions are present or the individual constituent is likely to be present in the effluent of a particular discharger on a continuous or recurring basis in quantities which could cause the water quality standards to be violated. The Commission believes that this approach is workable, and that the adoption of the additional standards should not significantly increase monitoring costs, except where there is reason to believe that these pollutants may be present. In such circumstances, additional monitoring—and, and if necessary, effluent limitations—is appropriate.

Some comment was submitted recommending that the Commission should apply the new standards only to streams classified for aquatic life and water supply, since the underlying criteria are based on a combination of water and fish ingestion. The Commission has rejected this alternative. Persons eating fish from Colorado streams can still be expected to drink water from some source, even if not the same segment. Both ingestion pathways should be protected, even if they do not occur at the same location. Therefore, the assumption that a portion of the potential total exposure is through drinking water is still valid.

Finally, the Commission intends to consider the application of the fish and water ingestion standards to class 2 aquatic life segments on a case-by-case basis, where there is evidence that fishing is a significant activity for the waters in question. The Division staff has begun to request information regarding fishing for particular streams, as the basin-by-basin triennial review hearings occur. The Commission specifically requests that in future basin-specific hearings the Division solicit information, at a minimum, from the Colorado Division of Wildlife and any applicable section 208 agency to determine those class 2 aquatic life segments on which significant fishing occurs.

**b. Risk-based Water Supply Standards.**

When the Commission adopted interim organic chemical standards in 1989, the Commission adopted standards based on maximum contaminant levels (MCLs) for all pollutants for which MCLs had been established under the Safe Drinking Water Act. The Commission has now reevaluated this policy and adopted health-based standards for these constituents instead of standards equal to the MCLs, whenever health-based criteria are available. Several considerations have led to this new approach.

The vast majority of the standards adopted in 1989 were already set equal to health-based criteria. MCLs generally are more lenient than health-based criteria, and have been developed taking into account laboratory detection limits and the economic ability of water suppliers to treat for removal of these constituents. For most dischargers, the availability of low flow dilution credits in calculating effluent limitations has resulted in a second level of relaxation—i.e. movement away from underlying health-based-levels—when applying non-health-based MCL standards. The Commission already has attempted to temper the application of stringent health-based standards for non-MCL organic pollutants by providing for the application of the practical quantitation limit (PQL) concept in determining compliance with the standards. Use of low flow dilution credits in calculating effluent limitations provides for a further tempering of these very stringent standards in application. Therefore, the Commission has determined that it is a more appropriate policy to base these water quality standards on health-based criteria, rather than MCLs. Revisions have been made to the standards as now contained in the consolidated Basic Standards for Organic Chemicals Table.

### c. Other Issues

Standards for a number of additional organic chemicals have been added to the Basic Standards for Organic Chemicals Table to help complete Colorado's compliance with section 303(c)(2)(B) of the federal Clean Water Act. The chemicals added are ones listed as priority toxic pollutants, and for which EPA has developed human health or aquatic life criteria under the Clean Water Act.

The Commission decided not to include in the consolidated Table standards for total trihalomethanes or for polynuclear aromatic hydrocarbons (PAHs) as a class. The Commission believes that it is more practical to regulate individual chemicals in these groups. Some evidence was submitted indicating that not all PAHs should have the same standard. For now the Commission has adopted these standards based on the available EPA criteria, although if more specific evidence on this issue is brought to the Commission in the future, revisions can be considered.

Several minor clarifications have been adopted in the Basic Standards for Organic Chemicals Table. A footnote has been added for the human health-based standards to indicate that these are chronic water quality standards. The “detection levels” column has been relabeled “PQLs” , to clarify that the values indicated are practical quantitation limits. In addition, the PQLs for a few parameters were revised to be consistent with the current information from the Colorado Department of Health laboratory. Inconsistencies in PQLs for individual chemicals have been avoided by adopting a consolidated table. The Commission declined to adopt a definition of “PQL” based on a fixed multiple of the method detection limit (MDL), since that would not accurately reflect current scientific practice.

The Commission chose not to list EPA laboratory analytical methods in the Basic Standards for Organic Chemicals Table. Dictating a specific analytical method in the regulation would unnecessarily constrain flexibility. Currently, the Division has discretion to approve the use of alternative methods. However, the Commission encourages the Division to make information regarding the standard analytical techniques available in a guidance document, so that this information will be easily accessible to the regulated community and the general public.

One party suggested that the Commission should specify that dischargers would not be subject to effluent limitations based on the aquatic or fish and water ingestion standards if they had passed whole effluent toxicity (WET) tests. WET tests only address potential toxicity to aquatic life and are therefore not an appropriate substitute for limits based on fish and water ingestion standards. Moreover, the Division already has discretion to determine the appropriate combination of chemical-specific effluent limitations and WET testing requirements to assure that potential toxicity to aquatic life is controlled. Therefore, the suggested change was not made.

The Commission has adopted a new subsection 3.1.11(4)(c), to enumerate factors that may be addressed in considering the adoption of site-specific standards to override statewide numerical standards. These provisions are intended to broaden the scientific base of information considered, not to limit protection. For example, these provisions do not mean that an area with a few people should receive a lower level of protection than a heavily populated area. Rather, certain sensitive populations may need to be considered in site-specific situations, e.g. children. The burden of demonstrating the relevance of these factors in a site-specific application would be that of the proponent of site-specific standards.

The Commission declined to make revisions that would broaden the applicability of section 3.1.11(5), since these provisions were adopted solely to clarify the interrelation of the statewide standards with the unique provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

## C. WATER QUALITY IMPROVEMENT

The Commission has been concerned that the current regulation does not contain as much flexibility as the Commission believes appropriate to address currently contaminated water segments where the

Commission believes that some improvement in water quality is desirable and feasible. The Commission has expressed a general discomfort with the extreme options of choosing either ambient quality-based standards or table value standards in segments where some improvement is expected but the degree of improvement is difficult to predict. The Commission often is left with the dilemma of either sending a message that it finds the status quo of existing contamination acceptable by setting ambient quality-based standards, or that it expects the water segment to reach table value standards within twenty years, when the actual degree of cleanup may be difficult to identify with certainty.

An additional concern of the Commission's has been that the water quality standards system has generally been reactive, rather that proactive. The Commission believes that the standards system should, where feasible, help facilitate the statutory goal “to protect, maintain, and improve “ Colorado's water resources. In this regard, a more proactive, goal-based approach would also help establish priorities for determining upon which water segments nonpoint source cleanup efforts might best be focused.

To address these concerns, the Commission considered the adoption of a new section 3.1.4, entitled “Water Quality Improvement Targets.” The provisions of this section would have been intended to operate in a manner independent from, but complementary to, the water quality classification and standards system. The key aspect of this section would have been the adoption of “numerical protection targets” , which would be used to help guide efforts at point and nonpoint source pollution control. In addition, in keeping with the statutory focus on beneficial use protection, this section would have provided for the adoption of “use attainment targets” , which would then be used as the basis for determining appropriate numerical protection targets.

Numerous concerns were expressed in the rulemaking process regarding this proposed new section, particularly with respect to uncertainties regarding the relationship of targets to the water quality standards system, and the practical effects of implementing targets in discharge permits. Upon consideration of all the evidence submitted, the Commission has decided not to adopt the proposed targets provisions at this time. However, the Commission continues to believe that pursuing opportunities for water quality improvement is an important priority that needs to be addressed further in the future. The Commission will continue to explore opportunities in this regard, and encourages any interested persons to advance to the Commission any recommendations that they may have.

## D. RECREATION CLASSIFICATIONS

The Commission has revised the description of the class 1 recreation classification. Although the previous definition was broad enough to encompass uses other than swimming, recent basin-specific hearings have resulted in controversy regarding how broadly that definition can or should be applied. The Commission believes that the operative factor for classifying waters recreation class 1 should be whether there are any activities that are likely to involve ingestion of water. This may include certain recreational activities that generally occur on the water, such as rafting, kayaking and water-skiing. This list of activities potentially involving ingestion is not intended to be exclusive. Other activities may warrant a class 1 classification in specific situations.

By clarifying the class 1 recreation definition in this manner, the Commission is not condoning or encouraging the ingestion of any untreated water. Rather, the Commission is recognizing the reality that ingestion occurs from these activities. In fact, experience indicates that these activities may involve a higher likelihood of ingestion of water than does swimming. Therefore, the definition in section 3.1.13(1)(a)(i) has been revised to further clarify the Commission's intent.

## E. INTEGRATION INTO DISCHARGE PERMITS

### 1. Implementing Narrative Standards.

Language has been added to section 3.1.14(4) to clarify that the Water Quality Control Division has authority to establish numerical effluent limitations for parameters for which no statewide or site-specific numerical standards have been adopted, when necessary to comply with the narrative standards in section 3.1.11(1). Such action by the Division does not constitute standard-setting. The effluent limitations developed are applicable only to an individual discharger. Moreover, this appears to be the only meaningful way to implement the narrative standards in practice. Application of such effluent limitations when necessary reflects the past and current practice of the Division. This language has been added to this regulation merely to recognize the appropriateness of this practice.

**2. Compliance Schedules.**

Language also has been added to section 3.1.14(4) to clarify that it is the Commission's intent that the Water Quality Control Division is authorized to utilize compliance schedules when appropriate in implementing water quality standards into discharge permits. Again, this revision merely confirms existing Division practice. This provision is being added to this regulation because of recent indications from EPA that states that may need to authorize the use of compliance schedules in their water quality standards regulations in order for such schedules to be included in discharge permits. Other compliance schedule issues raised by EPA in this proceeding are more appropriately addressed in the Discharge Permit Regulations.

**3. Metals Methods.**

Section 3.1.14(7) has been revised to clarify the appropriate analytical methodologies for metals monitoring. This revision is necessary since there are water segments which have both total recoverable and dissolved metals standards.

**4. Monitoring Requirements.**

The provisions of section 3.1.14(10) previously referred merely to the imposition of monitoring requirements with respect to organic chemicals standards. The language in this section has now been revised to apply to monitoring related to water quality standards in general. This change has been adopted because the Commission believes that, although this section was originally drafted with organic chemical standards in mind, the provisions contained therein are appropriate with respect to water quality standards generally.

**5. Effluent Limitations Requirements.**

As described with respect to the preceding revision, the Commission has revised section 3.1.14(11) to broaden its applicability to water quality standards in general, rather than merely organic chemicals standards.

**6. Acute v. Chronic Limitations.**

A new subsection 3.1.14(13) has been added, to clarify the relationship between chronic and acute effluent limitations, when implementing water quality standards.

**F. TABLE I, II, AND III REVISIONS**

**1. Table I Revisions.**

The Commission considered revisions to the dissolved oxygen values for aquatic life. The Division withdrew this proposal at this time, since it appears that EPA's position on this issue is still evolving. The Commission did adopt a new footnote to Table I, to help clarify the application of dissolved oxygen standards to lakes.

In 1988, the Commission considered and rejected a proposal to change the indicator parameter used for bacteriological standards. Although the issue was raised again in this hearing, the Commission does not believe that any new information has become available since 1988 to warrant a different conclusion.

**2. Table II Revisions.**

The total residual chlorine values for aquatic life have been revised, to be consistent with the 1986 EPA criteria. The Commission also has adopted a new table value for asbestos, to assure that criteria for all appropriate priority toxic pollutants are available for adoption on a site-specific basis if necessary.

**3. Table III Revisions.**

The Table III table values for aluminum, mercury, and zinc have been revised to reflect more current information that was unavailable when the Commission revised this regulation in 1988. With respect to zinc, limited information was submitted in the hearing questioning the appropriateness of the new criteria at low hardness levels. This issue can be considered further in the future, if more specific evidence is submitted to the Commission. With respect to mercury, the Commission has revised footnote 6 to Table III.

For the vast majority of stream segments in the state, the Commission has adopted the FRV (final residue value) of 0.01 ug/liter mercury as the numeric stream standard. The Commission has clarified that this standard applies to the “total” form. For a few segments, the Commission has adopted ambient-based standards or temporary modifications where site-specific studies have shown methylmercury concentrations in fish to be less than the FDA action level. New information contained in the 1990 Colorado Department of Health's Advisory for Consumption of Fish Contaminated with Methylmercury, indicates that methylmercury concentrations in sport-caught fish as much as one-fifth lower (0.2 ppm) than the FDA action level may pose a health risk to sensitive subpopulations such as the fetus, infants and children.

In consideration of this health risk assessment it becomes apparent that the FDA action level is not the only basis for evaluating concentrations of mercury in sport-caught fish. It may be possible to recalculate the FRV based on the health risk information, but the Commission decided not to, because the current FRV and any subsequent adjustments would place the resulting stream standard below the CDH detection limit for mercury in water of 0.25 ug/liter. From a practical standpoint, achievement of FRV or any adjusted FRV would still be based on instream values being below the detection limit.

It is the Commission's intent that due to the persistence of mercury in the environment and the new health risk information, mercury in effluent discharges be kept to the lowest levels possible, preferably below detectable concentrations. However, for those segments supporting fish or shell fish populations where there is the potential for human consumption and where an ambient-based approach is sought by a proponent, the Commission believes that a substantial case must be clearly demonstrated for adopting an ambient standard. Accordingly, footnote (6) of Table III for metals in Section 3.1.16 has been changed to reflect new information requirements based on the health risk assessment.

The Commission considered but declined to make revisions in the table value for selenium, based on a new EPA criteria document. Substantial questions were raised regarding the basis for the new EPA criteria, and the Commission believes that this issue should be examined more closely before the existing table values are changed.

The Commission has adopted new drinking water supply table values for antimony, beryllium, and thallium, to assure that criteria for all appropriate priority toxic pollutants are available for adoption on a site-specific basis if necessary. These table values will be applied on a site-specific basis only where there is reason to believe that there is potential concern regarding the pollutant in question. Such circumstances are not expected to arise frequently.

The Commission declined to adopt a proposal to change the table values for agricultural and domestic uses to the dissolved form rather than total recoverable, because no scientific basis for the change was provided.

The Commission declined to adopt a proposal to adopt PQLs for all parameters in Table III. This issue of standards below routine detection levels appears to be an issue for metals only with respect to mercury and silver. Therefore, only in these instances would the adoption of PQLs be significant. No proposals for specific PQLs were advanced by the parties to the hearing. If specific proposals are put forth in the future, the Commission can consider them in a subsequent rulemaking proceeding.

The Commission also declined to adopt regulatory provisions proposed by the Division of Wildlife to address certain sampling and analytical method issues. The Commission does not believe that these issues are appropriately addressed in this regulation, but encourages the Division to consider these recommendations.

## G. OTHER REVISIONS

### 1. Downgrading.

Section 3.1.6(2)(b) has been revised to delete a reference to the effective date of this regulation. First, this reference is somewhat confusing since there have been several revisions in this regulation. More significantly, the Commission believes that as a matter of policy and to be consistent with federal law, the downgrading restrictions should apply to use classifications whenever adopted, not merely to classifications that were in effect at some earlier date. In addition, in response to a recommendation by the Colorado Water Congress, the provisions of this section have been substantially revised to more closely parallel the federal downgrading provisions.

### 2. Use Attainability Analyses.

Section 3.1.6(3)(a)(iii) has been revised to clarify the circumstances in which it may be necessary for the Division or other advocate of omitting an aquatic life or recreation classification to perform a new use attainability analysis.

### 3. Segmentation.

The Commission rejected a proposal to add a new subsection (d) to section 3.1.6(4), to clarify the Commission's policy to minimize the number of segments established in its basin-specific classifications and standards whenever possible. Although it was intended to restate existing policy and not to indicate that segments should be combined where there is a reason for distinguishing between them, based on substantial concerns raised regarding the proposal, the Commission has decided that it is unnecessary at this time.

### 4. Table Value Standards Application.

Language has been added to section 3.1.7(1)(b) to clarify the criteria used by the Commission in determining whether to apply standards based on Tables I, II and III on a site-specific basis. This provision merely confirms existing practice. It is adopted in large part to clarify for EPA the fact that the Commission does apply such criteria in deciding when standards for priority toxic pollutants need to be adopted on a site-specific basis.

### 5. Acute v. Chronic Ambient Standards.

Section 3.1.7(1)(b)(ii) has been revised to clarify that when the Commission establishes chronic standards based on existing ambient quality, such standards must be at least as stringent as an acute toxicity standard based on table values. The purpose of this revision is to assure that the adoption of ambient

quality-based standards does not result in any acute toxicity in-stream. This revision is not intended to change the current methodology for determining compliance with ambient standards.

**6. Low Flow Exceptions.**

Section 3.1.9(1) has been revised to clarify the Commission's intention with respect to the application of standards during low flow conditions. In particular, the language has been revised to indicate that the 30E3 and 1E3 flow values are to be utilized as minimum dilution assumptions for developing discharge permit effluent limitations. This is consistent with existing practice. However, the language has been revised to clarify that water quality standards apply to streams at all times. In other words, merely because a stream happens to be currently at a flow below its established low flow values, does not mean that someone would be allowed to dump pollutants into the stream in violation of the standards. Again, this is not intended to change the existing practice with respect to the development of discharge permit effluent limitations.

**7. Editorial Revisions.**

Minor editorial revisions have been made to sections 3.1.1, 3.1.6(3)(b)(iii)(2), 3.1.16(1), 3.1.16(3)(L), footnote 4 to Table II and the Table II entry regarding ammonia. These revisions delete certain language that is no longer necessary or applicable, and make minor clarifications in the existing provisions.

## H. OTHER REJECTED PROPOSALS

A number of additional proposals for revisions to this regulation were raised during this rulemaking proceeding. Although no attempt is made to comprehensively list every such proposal, several of the more significant ones considered and rejected by the Commission are noted below.

Several proposals were advanced to add new definitions to section 3.1.5. The Commission does not believe that the additional definitions proposed are necessary at this time. The Commission rejected a proposal to add additional provisions to section 3.1.6(2)(a) regarding “upgrading” because it does not believe these revisions are necessary at this time. A proposal for revised mixing zone provisions was not addressed, since it was not within the scope of the issues noticed for this hearing. A proposal to revise section 3.1.10 regarding Otherwise Dry Streambeds was rejected because the Commission believes that the concerns raised are more appropriately addressed in the pending revisions to the State's biomonitoring regulations. Finally, several proposals to revise the narrative standards in section 3.1.11(1) were rejected because the Commission believes that the current standards are workable, and it has not been demonstrated that there is a need for revisions at this time.

PARTIES TO THE RULEMAKING HEARING FOR BASIC STANDARDS & METHODOLOGIES FOR SURFACE WATER AND GROUND WATER

1. Adams Rib Recreational Area
2. EG&G Rocky Flats
3. Northwest Colorado Council of Governments
4. The Grand County Water & Sanitation District #1, Fraser Sanitation District and Winter Park Water and Sanitation District
5. The Metro Wastewater Reclamation District
6. Amax, Inc.
7. Kodak Colorado Division
8. Paramount Communications Inc.
9. Schlage Lock Company
10. The Colorado Water Congress
11. Chevron Shale Oil Company
12. Adolph Coors Company
13. Remedial Programs Section, Hazardous Materials & Waste Management Division, Colorado Department of Health

14. Umetco Minerals Corporation
15. Martin Marietta Corporation
16. Shell Oil Company
17. Cotter Corporation
18. Union Oil Company of California
19. Supervisory Committee of the Littleton-Englewood Bi-City Wastewater Treatment Plant
20. Arapahoe County Water and Wastewater Authority
21. City of Colorado Springs Wastewater Department
22. Colorado Wastewater Utility Council
23. Colorado Mining Association
24. Getty Oil Exploration Company and Texaco
25. Colorado River Water Conservation District
26. Exxon Company, USA
27. St. Vrain and Left Hand Conservancy District
28. Division of Wildlife
29. North Front Range Water Quality Planning Association
30. City of Westminster
31. City of Colorado Springs Water Department
32. Res-Asarco
33. Three Lakes Water & Sanitation District
34. City of Arvada
35. Northern Colorado Water Conservancy District and the Municipal Subdistrict, Northern Colorado Water Conservancy District
37. Environmental Defense Fund
38. Cherokee Water and Sanitation District, Security Sanitation District, and the Fountain Sanitation District

## 31.27 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; MARCH, 1993 HEARING ON WETLANDS CLASSIFICATIONS AND STANDARDS:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

**Basis and Purpose:**

### A. WETLANDS

### 1. Definitions

The Commission considers the existing definition of “state waters” broad enough to include wetlands. Therefore, the definition has not been modified.

To add further clarity in this regard, a definition of “wetlands” has been added to the regulation. This definition is the same as that used by both EPA and the U.S. Army Corps of Engineers, except that the list of examples included in the federal definition has been omitted. These examples do not appear to be generally relevant to the types of wetlands most likely to be found in Colorado. The Commission believes that use of this definition is appropriate for consistency with Clean Water Act programs. The Commission recognizes that the site-specific application of this definition has led to considerable controversy, for example with respect to the Federal Interagency Delineation Manual. That controversy addresses a level of detail that is beyond the scope of this hearing. The Commission generally anticipates that implementation of this definition in Colorado will be consistent with the federal delineation manual once it is finalized, taking any relevant regional differences into account. However, the Commission will await resolution of the issues pertaining to the federal delineation manual and, depending on how such issues are resolved, may elect to provide further clarification or refinement regarding the appropriate delineation of wetlands in Colorado.

A definition of “constructed wetlands” has also been added to the regulation. This definition is intended to provide further clarification as to which wetlands will be subject to water quality classifications and standards. Consistent with the definition of “state waters” , those wetlands that are designed, constructed and operated for the purpose of treatment of wastewater or storm water, including wetlands designed, constructed, and operated as a system or part of a system for control, storage, or retention of wastewater or storm water, are excluded from coverage. Wetlands constructed as a part of environmental remediation provided under CERCLA or RCRA and section 319 of the Clean Water Act are also excluded since they also serve primarily a treatment function. The Commission has used the term “primary purpose” rather than “sole purpose” because it recognizes that some wetlands created for the purpose of treatment may, as a secondary matter, provide other beneficial functions. These secondary benefits should not be discouraged by an overly restrictive definition of constructed wetlands.

There was considerable debate in the hearing regarding whether wetlands constructed for treatment on previously existing wetlands sites should qualify as constructed wetlands, and thereby be excluded from state waters. The Commission believes that such wetlands should be considered constructed wetlands where approval or authorization has been obtained under section 404 of the Federal Act for filling in the previous wetlands. In other words, if a judgment is made in the 404 program that previously existing wetlands may appropriately be eliminated by or transformed into new constructed wetlands for treatment purposes, the water quality standards system should be applied in a manner that is consistent with that determination. Moreover, the existence of the water quality standards adopted by the Commission for wetlands is not intended to affect section 404 permit determinations regarding the permanent filling of areas of state waters. Rather, the standards are intended to govern activities potentially impacting wetlands that will continue to exist as (other than constructed) wetlands after any fill occurs. The Commission recognizes that some flood control, urban drainage improvement and stormwater management activities may have been conducted without prior 404 approval, but such activities may have resulted in the creation of wetlands which could be useful for purposes of complying with the new stormwater discharge requirements. If 404 requirements are demonstrated to be no longer applicable or enforceable, or after-the-fact authorization can be obtained from the Corps of Engineers, such created wetlands shall be considered constructed wetlands. Constructed wetlands are required to be permitted under the CDPS system if they are designed to provide treatment for wastewater or stormwater point sources and discharge to state waters. However, there is nothing in the regulation that interferes with the Corps of Engineers' responsibility to negotiate mitigation for wetlands lost in a project for which a section 404 permit is required.

Next, a definition of “compensatory wetlands” has been added which includes wetlands created to mitigate for adverse impacts to other wetlands. The definition of constructed wetlands includes a provision clarifying that wetlands created to provide mitigation for adverse impacts to other wetlands will not qualify as “constructed wetlands” . If new wetlands are created essentially to replace other wetlands which were state waters, such new wetlands should also be protected as state waters.

Next, a definition of “created wetlands” has been added. Many wetlands today are not natural, but rather created as a result of human actions. In many instances, such wetlands are the unintentional result of topographic or hydrologic modifications undertaken for other purposes. Examples would include wetlands resulting from highway construction or from irrigation tailwaters. These wetlands satisfy the statutory definition of “state waters” . However, they have been separately defined because the Commission believes that their varied nature warrants separate treatment under the water quality classification and standards system, as discussed further below.

The final revision to the Definitions section is the addition of a definition of “tributary wetlands” . The Commission has added this term to the definitions because it is used in section 3.1.13(1)(e) to identify certain wetlands that are subject to existing surface water classifications, and some of the associated standards, on an interim basis. Tributary wetlands either serve as the headwaters of surface waters or are wetlands within the floodplain. Tributary wetlands have been defined in this manner because there is a strong hydrologic connection characterized by rapid permeabilities between surface and ground water in the floodplain. This is because at some point during the past a river has occupied each and every position within its floodplain resulting in deposition of porous cobble material and sand and gravel

throughout the floodplain. Waters and tributary wetlands may directly influence water quality in downgradient stream segments and, waters in streams may directly affect water quality in hydrologically downgradient wetlands.

To summarize, the result of this set of definitions, as further elaborated below, is as follows: (1) all wetlands that are not constructed wetlands are state waters, and are subject to the narrative standards; (2) all tributary wetlands are initially subject to interim classifications and numeric standards; (3) created wetlands are initially subject only to the narrative standards; (4) compensatory wetlands are subject to the classification and standards of the segment in which they are located; and (5) wetlands that are not tributary wetlands or created wetlands (sometimes referred to generally as isolated wetlands) are also initially subject to the narrative standards.

**2. Classifications**

The Commission has decided as a matter of policy that the approach to water quality classifications and standards for wetlands in Colorado that will result in the most appropriate protection of the resource with the least disruption to the current system is a two-step process. The initial step is a clarification that for wetlands that are tributary to other surface waters (except for created wetlands), the classifications adopted for the segment into which the wetlands fall will apply on an interim basis. This is consistent with the Commission's approach to classifying all tributaries of a segment. This approach will also ensure that the use of the streams to which the wetland is tributary is not impacted. The Commission recognizes, however, that the use of wetlands as drinking water supply sources is highly unlikely. For that reason, the Commission's rule exempts tributary wetlands from the drinking water supply classification, even if the segment to which they are hydrologically connected is subject to such classification. This does not mean that drinking water supply cannot be considered a water quality dependant function of wetlands, but only that such a determination must be made on a case-by-case basis. The Commission intends that in the next round of basin-specific rulemaking hearings appropriate language will be added for each basin to further clarify the application of existing classifications as interim classifications for wetlands that are tributary to other surface waters in the basin.

The Commission has provided that existing surface water classifications will not be considered to apply to created wetlands, which have been defined as described above. Rather, these wetlands will initially be subject only to the narrative standards set forth in new subsection 3.1.11(1)(b). The Commission has determined this distinction to be appropriate because of the varied nature of these wetlands. Because these wetlands are not natural, their functions may in many instances be more limited than those of other wetlands. Moreover, a blanket application of classifications and standards to these wetlands may create a counter-productive incentive for the elimination (e.g. through draining) or prevention of such wetlands in the future. Given the already apparent disagreements regarding the proper implementation of the wetland narrative standards and the inherent difficulties in distinguishing between tributary and created wetlands, the adopted approach to regulation of created wetlands (i.e., initially applying narrative standards only) is likely to be more resource intensive and more difficult to implement than the approach to regulation of tributary wetlands. Some parties at the hearing expressed concern with the potential abuse of this approach and the burdens faced by the Division if required to make a demonstration that a wetland is <u>not</u> created. In the created versus tributary wetlands determination, the Commission expects that wetlands that otherwise meet the definition of tributary wetlands, will be presumed to be tributary until shown to be created by human activity as specified in the created wetlands definition. Finally, it should be noted that if it is determined that specific wetlands of this type warrant additional or more precisely defined protection, the wetlands classification described below, along with associated site-specific standards, can be adopted.

The second step in the process established by the Commission is the application of the new wetlands classification established in section 3.1.13(1)(e)(v), which can be applied on a site-specific basis. The protection resulting from such a site-specific classification could be more or less stringent than that provided by the interim classifications. Some wetlands may have unique functions that are not adequately protected by the interim classifications and standards. In other instances, the interim classifications and standards may protect uses, e.g. sensitive aquatic species, that are not present in particular wetlands and

therefore do not require site-specific protection. Because the initial adoption of the wetlands classification, and associated site-specific standards, to replace the interim classifications would provide the first opportunity for review of the site-specific factual circumstances of the wetlands in question, the Commission has provided that such a revision would not be considered a downgrading. This provision is intended to apply only the first time a wetland-specific classification and associated standards are adopted to replace the interim standards established by this rulemaking action.

The new wetlands classification also can be applied to any wetlands that are not tributary to other surface waters. These wetlands, sometimes referred to as isolated wetlands, would initially be protected by the statewide narrative standards in new subsection (1)(b) (discussed below), which apply to all state surface waters. In addition, since these wetlands would generally be associated with the ground water table, they would receive some protection from the statewide, regional, and site-specific ground water quality standards that the Commission has adopted.

Where the Commission applies the new wetlands classification on a site-specific basis, the intent of establishing the classification will be to maintain or restore appropriate wetland characteristics and functions, within the range of natural variation of the affected wetland. Thus, where the site-specific wetlands classification includes the “sediment or other pollutant retention” function, the intent of including this function within the classification is to promote the maintenance or restoration of the natural wetlands characteristics. The classification should not be viewed as authorizing or promoting the use of the wetlands for treatment or retention of sediments or other pollutants from human sources. Rather, the Commission intends that this classification be interpreted and applied in a manner consistent with section 131.10(a) of the federal water quality standards regulation, which prohibits adoption of waste transport or waste assimilation as a designated use for any waters of the United States. The wetlands functions to be protected should be related to water quality and determined on a site-specific basis.

**3. Standards**

All wetlands that are state waters (i.e. not constructed wetlands) are subject to the statewide basic standards for all state waters contained in section 3.1.11. Concerns were raised in the hearing regarding the appropriateness of the previous narrative standards (section 3.1.11(1)(a)–(f)) for waters in wetlands. The Commission believes that not all of these standards are appropriate for wetlands.

Accordingly, section 3.1.11(1) has been amended and new subsections (a) and (b) have been created. Subsection (a) continues to apply all narratives to all surface waters, except wetlands. Subsection (b) specifies the narrative standards which are specifically applicable to wetlands.

A number of parties expressed concern regarding the potential use of the regulation and, in particular, the narrative standards, to create or expand other agencies' jurisdiction over wetlands. The Commission does not have the authority to create or expand the authority of other agencies and, therefore, this regulation cannot have such an effect. Neither the narrative standards nor the numeric standards proposed in this rule are self-implementing. Rather, implementation occurs only through discharge permits or other independent regulatory programs specifically designed to include water quality standards implementation as one of their purposes. It is the intent of the Commission that, to the extent these regulations are utilized by other agencies under independent statutory authority, the Division's interpretation thereof, as reflected in Division implementation guidance or otherwise, must be followed by such agencies. For example, the Commission intends that compliance with the water quality standards developed in this proceeding be determined using the techniques, methodologies and policies used by the Division for determining compliance with the adopted standards.

Subsection (1)(b)(i) incorporates a new narrative standard which addresses discharges that would be harmful to water quality dependent functions of wetlands. Each wetland function outlined in section 3.1.13(1)(e)(v) may be considered to be a water quality function of the wetland, depending on the facts of each case. The Commission intends that implementation of this narrative standard only address activities with adverse water quality impacts. This provision is not intended for example, to be applied as a biological criterion for wetlands that would more broadly mandate preservation of wetlands functions. Any

such regulatory provisions should be addressed as part of the broader biological criteria issue, on which the Commission has chosen to defer the adoption of binding standards at this time. The new narrative standard in subsection (1)(b)(i) also addresses the potential impact of discharges which affect the pH of the wetland in such a manner as to harm the water quality dependent functions of the wetland. Considerable testimony about the need to protect wetlands from discharges of substances that could cause significant changes in pH was provided by EDF. Based on this testimony, the Commission has elected to adopt a specific prohibition against the discharge of pollutants in amounts that produce changes in pH to such degree as to harm the water quality dependent function of the wetland.

In addition, all wetlands would receive the protection offered by the applicable portions of the antidegradation rule contained in section 3.1.8. A provision has been included in section 3.1.7(1)(b)(iv) to provide that all created wetlands will initially be considered to have a “use-protected” designation. For the same reasons that the Commission has decided to initially apply only narrative standards to these wetlands, the Commission believes that a blanket subjection of such wetlands to antidegradation review requirements is not appropriate at this time. To the extent that specific wetlands do warrant such review, that can be addressed in the site-specific classification and standard-setting process.

The need to apply the narrative standards to created wetlands is not expected to arise very frequently. If this need does arise, e.g. due to a proposed point source discharge into such a wetland, the Commission intends that the water quality dependent functions of the particular wetland would be considered by the Division in applying the standards. In many circumstances, those functions may already be limited by the quality of the inflow that has led to the, sometimes unintentional, creation of the wetland in the first place. In such instances, the discharge of additional flows of similar quality may not interfere with those functions. The Commission recognizes that created wetlands can provide beneficial storm retention and cleansing functions, and intends with these provisions to allow enough flexibility so that such functions can be protected without imposing a degree of regulation likely to result in unreasonable treatment costs or a disincentive to the preservation or future creation of such wetlands.

Consistent with the Commission's two-step approach discussed above, wetlands subject to the interim classifications described in section 3.1.13(1)(e)(iv) (i.e., tributary wetlands) shall be initially subject to the numeric standards adopted for the applicable segment, unless it is demonstrated that said standards are not being met in the wetland in question. To the extent that such a standard is not met for any given parameter, the applicable interim standard shall be the ambient levels for that parameter. The determination of ambient quality shall be made by, or in consultation with the Division, on a case-by-case basis based on available data and information. The Commission expects that ambient conditions, for purposes of subsection 3.1.7(1)(b(iv)(A), will be determined in accordance with the past Division practice in recommending ambient water quality standards for adoption by the Commission.

These interim standards will apply until the Commission adopts site-specific standards for the tributary wetlands in question. The Commission expects to review any interim ambient standard established pursuant to subsection iv(A), during the Commission's triennial review of the basin in which the wetlands subject to such interim standards are located. Upon triennial review, where ambient based interim standards have been developed by the Division, the Commission will establish site-specific standards such as: permanent ambient quality based standards, table value standards, temporary modifications or alternative numeric standards when the “wetlands” classification is adopted. The Commission may determine, however, that insufficient data exists to adopt the interim ambient based standard(s) developed by the Division on a permanent basis. Such standards will be based on very limited data in many cases. A trial and error period and an iterative approach will typically be needed to address stormwater discharges and nonpoint sources impacting wetlands water quality. While the Commission recognizes that the issue of an appropriate numeric standard, which is demonstrated to protect the use(s) of state waters, needs to be resolved through rulemaking as quickly as possible, it may be necessary to allow time to gain implementation experience, acquire field data and to evaluate the effectiveness of various BMPs. When additional data is necessary to establish appropriate numeric standards or additional time is needed to achieve the numeric standards for which adequate supporting data has been collected, the Commission may adopt the interim values as temporary modifications. A temporary modification is generally appropriate in such cases because it will allow time to evaluate options for

establishing or achieving the underlying standards or for development and adoption of more appropriate site-specific standards be they basin standards or ambient based standards.

In many cases, the stream standards on which the tributary wetland's standards are based are expressed as a function of the total hardness of the stream in question (i.e., table-value standards for protection of aquatic life for certain metals found in Table III, Section 3.1.16). The Commission expects the interim numeric standards for protection of aquatic life in tributary wetlands to be expressed as a function of total hardness as well. In addition, the Commission finds that the concept of water effect ratio, as developed by EPA in its recently adopted toxics criteria for aquatic life (57 Fed. Reg. 60,848 (12-22-92)), is appropriate in the development of numeric criteria for protection of aquatic life in wetlands. Accordingly, the Commission has adopted language that allows the Division or agencies implementing these standards and classifications for wetlands to express the appropriate numeric standard as a function of both hardness and water effect ratio of the pollutant in question. The Commission expects such adjustments to be made at the time of permitting, certification, or other action by the Division or other agency implementing these standards and classifications for wetlands, in a manner consistent with EPA's criteria. The water effect ratio of a pollutant shall be assigned a value of 1.0, except where the implementing authority assigns a different value that protects the designated uses of the water body.

Altemative numeric standards, to apply when the “wetlands” classification is adopted to replace the interim classifications, or for specific created wetlands, will need to be developed on a case-by-case basis, taking into account the functions of the wetlands in question. In making this determination, the Commission will take into account all relevant and available information. This information may include, e.g., whether the wetlands are natural or created, or, in the case of the latter, the reason for their creation. Given the diversity of functions of individual wetlands, the Commission does not believe that an effort to develop general “table values” for this new classification would be feasible or constructive at this time.

The Commission has decided not to adopt biological criteria as water quality standards for wetlands at this time. Very little is known at present about the structure and function of aquatic communities within wetlands. Concerns that have been raised regarding the lack of standardized, field-tested biological evaluation techniques are much more significant with respect to wetlands than for other surface waters.

Considerable concern was expressed in the hearing regarding the potential impact of wetlands water quality standards on activities involving the exercise of water rights. As in all other areas of Colorado's water quality program, the potential for application of these standards in a manner detrimental to water rights is constrained by the provisions of section 25-8-104, C.R.S. However, in an effort to more directly alleviate concerns in this regard, the Commission has adopted new subsection 3.1.7(1)(b)(iv)(G), to clarify that wetlands water quality standards shall not be interpreted or applied in a manner that restricts the lawful exercise of water rights.

The Commission expects that in permitting the discharge of pollutants into the state's streams, the Division will ensure the protection of the downstream wetland uses. However, where the downstream, tributary wetland is upgradient of the stream, there may be no pathway from the stream to the wetland. In such circumstances, the discharge to the stream need not be regulated for the protection of the wetland use.

PARTIES TO THE RULEMAKING HEARING MARCH 2, 1993

1. Res-ASARCO
2. The Lake Catamount Joint Venture
3. Vail Valley Consolidated
4. The City of Thornton
5. The Cache La Poudre Water Users Association
6. The Water Supply and Storage Company
7. The Thompson Water Users Association
8. The Cache La Poudre Reservoir Company & the New Cache La Poudre Irrigating Company
9. The North Poudre Irrigation Company

10. The Larimer-Weld Irrigation Company, The Larimer-Weld Reservoir Company & The Windsor Reservoir Canal Company
11. The Littleton/Englewood Wastewater Treatment Plant
12. NaTec Minerals, Inc.
13. Fort Morgan Reservoir and Irrigation Company
14. The City of Colorado Springs
15. Metro Wastewater Reclamation District
16. Northwest Colorado Council of Governments
17. Colorado Mining Association
18. Northern Colorado Water Conservancy District & Municipal Subdistrict
19. Martin Marietta Corp.
20. Shell Oil Company
21. Cotter Corporation
22. Vail Associations
23. Environmental Defense Fund
24. Battle Mountain Resources
25. Denver Water Board
26. The Home Builders Association of Metropolitan Denver
27. The City and County of Denver
28. Colorado Ski Country USA
29. Cherry Creek Basin Water Quality Authority
30. North Front Range Water Quality Planning Association
31. Division of Wildlife

## 31.28 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE; JANUARY, 1993 HEARING ON WATER QUALITY DESIGNATION PROVISIONS:

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-209 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

**Basis and Purpose:**

### A. Overview

House Bill 92-1200 was adopted by the 1992 Colorado Legislature. This act establishes a new section 25-8-209 in the Colorado Water Quality Control Act, concerning water quality designations. The purpose of this rulemaking hearing is to conform the Commission's regulatory provisions regarding water quality designations with these new statutory provisions.

The Basic Standards regulation previously provided for three water quality designations that could be applied to state surface waters in appropriate circumstances: high quality 1, high quality 2, and use-protected. H.B. 92-1200 does not require that any changes be made to the existing use-protected criteria. Consequently, only a few minor changes necessary to conform the use-protected provisions with other portions of the regulation were made.

### B. Deletion of High Quality 2 Designation

In accordance with new section 25-8-209 of the Act, section 3.1.8 of the Basic Standards regulation has been revised to delete the high quality 2 waters designation. This revision does not change which waters will be subject to antidegradation review. Barring new information indicating that a use-protected or outstanding waters designation is appropriate, all waters previously designated high quality 2 will be undesignated but still subject to antidegradation review once these revisions are fully implemented in the basin-specific hearings. Until specifically revised in the triennial review process or in hearings held pursuant to section 25-8-207 of the act, all existing high quality class 2 designated segments are to be considered reviewable water subject to the antidegradation review provisions of 3.1.8(3).

The Commission is hopeful that the deletion of the high quality 2 designation will eliminate the risk that other agencies might misunderstand and misapply the high quality 2 designation. This designation was intended to denote waters for which an antidegradation review is required prior to approval of activities with new or increased water quality impacts. Concern was expressed by a number of entities that this label was likely to be used by other agencies for purposes broader than requiring antidegradation reviews, and in a manner that may unduly restrict beneficial economic activities. The Commission believes that the revisions being adopted to conform with the provisions of H.B. 92-1200 will still result in protection of the quality of Colorado's water resources in a manner fully consistent with the state and federal acts, while eliminating this risk of misuse of the high quality 2 designation. To further safeguard against misuse, the Commission included the statutory language prohibiting misinterpretation in 3.1.8(1)(D).

**C. Outstanding Water Criteria**

Section 25-8-209 essentially changes the label for those waters for which no degradation is allowed from “high quality 1” waters to “outstanding waters” . To date, the Commission has designated only seven specific surface water segments high quality 1. Each of these segments automatically become outstanding waters, pursuant to section 25-8-209(3)(b).

The Commission is also directed to promulgate criteria governing these designations. In addition, this section now sets forth certain determinations that must be made by the Commission before an outstanding waters designation is applied to specific waters. The provisions adopted by the Commission with respect to each of these determinations are addressed below.

In addition to the criteria for the three determinations, the Commission has adopted a proviso that no outstanding waters designation shall be adopted for specific waters if the Commission determines that such designation would be inconsistent with the provisions of section 25-8-102 or 25-8-104, C.R.S. This proviso is consistent with the requirements of new section 25-8-209(2). The application of an outstanding waters designation is a powerful tool. It can help assure protection of some of our state's outstanding natural resources, the preservation of which will be beneficial to Colorado's future environmental and economic health. At the same time, the restrictions associated with this designation are extreme, and it is essential that it be applied with discretion so as to not unduly restrict future development in Colorado. Application of this proviso will require case-by-case judgment, balancing considerations such as those listed above. The Commission does not believe that it is possible to enumerate in advance all of the circumstances where this language may be applicable.

**1. Quality Test**

The new statutory language provides that the Commission must determine that the quality of any waters designated “outstanding waters” is better than “fishable, swimmable” , based upon indicator parameters identified by the Commission. The Commission has selected 12 indicator parameters for this test. This list of parameters is the same as used in the previous high quality 2 water quality test, except that iron and mercury have been deleted and un-ionized ammonia and nitrate have been added.

Based on the professional judgment of the Water Quality Control Division staff, iron has not been as good an indicator of water quality as other metals, due to questions regarding its toxicity to aquatic life. Mercury has been deleted because questions regarding appropriate detection limits have unduly complicated its use as an indicator parameter. Moreover, it is the judgment of the Division and the Commission that the remaining metals parameters provide an adequate indication of water quality with respect to this category of inorganics. Un-ionized ammonia and nitrate have been added based upon recommendations that the types of indicator parameters used be broadened, particularly to include nutrients, and in the case of nitrate to indicate the suitability of the water for domestic water use.

The Commission has again considered the issue of whether minimum data requirements for this test ought to be included in the regulation. The Commission has chosen as a matter of policy to require that water quality determinations be based on “adequate representative data” , without attempting to quantify

that requirement. The Commission continues to believe that case-by-case judgment considering all of the available information regarding a particular segment (e.g. upstream and downstream quality, surrounding land use, presence or absence of point sources) must be considered to determine what is adequate data in a particular circumstance. However, the Commission has added a new requirement that there be at least some data for each of the 12 indicator parameters from samples taken within the segment in question. This does not mean, e.g. that data is required from all tributaries within a segment, but some data from within the segment must be available for all 12 parameters. The one exception provided is where the remote location of a segment makes it impractical to collect and analyze fecal coliform data within the required holding time.

The City of Colorado Springs, a party to the hearing, requested that all data used to determine designations be “scientifically reliable.” The Commission rejected that request citing concern over likely confusion in interpreting such a requirement and noting that it always has and will continue to expect all data used to support standards or designation proposals to be scientifically reliable.

**2. Outstanding Natural Resource**

The second determination to be made by the Commission is that the waters in question constitute an outstanding natural resource. The Commission has established two bases for making this determination. First, this test will be considered to be met whenever waters are a significant attribute of certain categories of outstanding state fishing waters (Gold Medal Waters) or federal lands that have been given one of the types of protected status listed. The Commission believes that the presence of these federal designations is evidence that the waters are part of an outstanding natural resource. The inclusion in the regulation of the list of these federally designated lands is not intended to indicate that waters in other areas, such as lands with special state designations, do not warrant the outstanding waters designation. The application of the designation to other areas is addressed in subsection 3.1.8(2)(a)(ii)(B) of the regulation, and discussed in the following paragraph.

The second basis established for this determination is where the Commission finds that the waters in question have exceptional recreational or ecological significance, and that they have not been modified by human activities in a manner that substantially detracts from their value as a natural resource. The Commission believes that there are outstanding natural resources in Colorado that have not received one of the federal land use designations referenced above. Application of this provision will require case-by-case judgment, based upon all of the available facts. From a review of the available information, including the approaches taken in other states, the Commission has been unable to come up with a more concrete or specific formulation of this concept. However, the Commission intends that for this test to apply the waters in question should have the same type and degree of attributes that in other circumstances have led to adoption of one of the federal land use categories listed.

The language in the last half of the first sentence of subparagraph (B) is intended to assure that the outstanding waters designation is not applied to waters in an area whose natural resources values have already been significantly degraded by human impacts. The Commission believes as a matter of policy that this designation should be reserved for substantially unimpacted areas.

A number of parties requested that the Commission insert language in subsection B to help assure that outstanding waters designations are not applied in a manner inconsistent with Section 25-8-104. Particular language proposed would have required approval from the owner and operator before waters in a reservoir could be designated “outstanding.” Disapproval could only be based upon evidence that the additional water quality protection provided by the outstanding waters designation would have caused or resulted in material injury to an existing water right. The Commission declined to add the proposed language because it believes it is inappropriate and potentially confusing to single out one particular type of water right for what may appear to be special protection. The Commission understands the mandate of Section 25-8-104 to apply to all water rights. It also believes the protection afforded by Section 25-8-104 does not need to be placed in regulation to be applicable. Whenever any state water is proposed to be designated outstanding, persons with water rights associated with such water may bring evidence to the Commission of how the proposed designation will affect their water rights. Any information the

commission receives will be considered in determining the appropriate designation, consistent with the requirements of Section 25-8-104.

**3. Additional Protection**

The third determination required by section 25-8-209 for the application of an outstanding waters designation is that protection over and above (1) classifications and standards and (2) antidegradation review is required. The Commission believes that this determination essentially requires a policy judgment that protection of the waters in question is important enough to prohibit any degradation. The Commission recognizes that this determination can have major consequences for potential future development in the area in question, due to the “no degradation” restriction associated with the outstanding waters designation. Therefore, this determination should be made only after full consideration of the appropriateness of this result in the area in question.

Some have suggested that this provision means that the outstanding waters designation can not be applied to waters that already have some other form of protection, such as wilderness designation—i.e., that in such circumstances the Commission designation is not “required” to assure protection of the water quality. The Commission disagrees with this interpretation of the statutory language. Such an interpretation would prevent application of the outstanding waters designation to waters that may be among those most deserving of protection, as already indicated by other formal designations. The Commission understands the statutory language to mean that the Commission must determine that the “no degradation” result is required to achieve appropriate protection of the water resources in question. The Commission does not understand this language to require a judgment on its part regarding the adequacy of controls resulting from, e.g., federal land use designations to achieve this goal. Moreover, the Commission believes that the contrary interpretation described above would be directly inconsistent with the fact that the Legislature “grandfathered” all existing high quality 1 designations—each of which are for waters located in wilderness areas or Rocky Mountain National Park—as outstanding waters designations.

**Other Issues:**

The Commission considered whether to include in the regulation further provisions addressing the appropriate implementation of the “no degradation” restriction associated with the outstanding waters designation. The Commission has decided not to do so, in large part because there appears to be no practical need to do so at this time. To date, the high quality 1/outstanding waters designation has been applied only in areas where there are no activities likely to result in measurable impacts to the waters in question. The Commission does not believe that this situation is likely to change substantially in the near future.

At the same time, the Commission notes that even EPA has recognized some flexibility in the application of this highest category of protection. For example, EPA's Water Quality Standards Handbook provides that “States may allow some limited activities which result in temporary and short-term changes in the water quality of ONRW [EPA's parallel to “ outstanding waters “ ]” . EPA Handbook at 2-14. The Commission believes that similar flexibility is appropriate in Colorado should future implementation issues arise.

Two parties to the hearing asked that other portions of the regulation not specifically provided for in statute be eliminated or significantly revised in this rulemaking. The Commission declined to make such changes to the antidegradation portion of the regulation primarily because this proposal was a direct result of HB 92-1200 which was limited in scope, and the hearing record to support modifications to rule beyond those necessitated by the statute was not extensive.

Finally, the Commission decided not to repeat the statutory limitations on Section 401 certifications of 404 permits (25-8-302) in the section of this regulation addressing applicability (3.1.8(3)(a)) because such repetition is unnecessary and can cause confusion.

PARTIES TO THE RULEMAKING HEARING

1. Climax Molybdenum Co.
2. Environmental Defense Fund
3. Colorado Mining Association
4. City of Golden
5. Cherry Creek Basin Water Quality Authority
6. City of Colorado Springs
7. City of Westminster
8. The Board of Water Works of Pueblo
9. Plum Creek Wastewater Authority
10. City of Arvada
11. Littleton-Englewood Bi-City Wastewater Treatment Plant
12. Colorado Division of Wildlife
13. City & County of Denver Board of Water Commissioners
14. Northwest Colorado Council Governments
15. Northern Colorado Water Conservancy District & the Municipal Subdistrict of Northern Colorado Water Conservancy District
16. North Front Range Water Quality Planning Assc.

## 31.29 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; OCTOBER 4, 1993, HEARING:

The provisions of C.R.S. 25-8-202(1)(a), (b); provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

**BASIS AND PURPOSE**

The Commission held this rulemaking to allow for the insertion of several pages that were inadvertently left out of the regulation in previous publications. These pages were promulgated by the commission with the regulation at the time of adoption.

## 31.30 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1993 REVISIONS—DIMP STANDARD)

The provisions of Colorado Revised Statutes (C.R.S.) Sections 25-8-202(1)(b), (2), and 25-8-204 provide the specific statutory authority for adoption of the attached regulatory amendment regarding a statewide surface water standard for diisopropylmethylphosphonate. In support of the regulatory amendment and in accordance with 24-4-103(4) C.R.S., the following statement of basis and purpose is provided.

### I. Overview

### a. Diisopropylmethylphosphonate (DIMP)

The purpose of this hearing was to consider the adoption of statewide water quality standards for diisopropylmethylphosphonate (DIMP). DIMP is a liquid chemical, a by-product from the manufacture and detoxification of a nerve agent, Sarin or GB (isopropylmethanefluorophosphonate), produced by the U.S. Army (Army) at the Rocky Mountain Arsenal in the 1950s. This is an area on the Front Range of the Rocky Mountains, just north of Denver. The Army disposed of DIMP, along with other chemicals, primarily in surface impoundments at the Rocky Mountain Arsenal where it leached into the underlying soils and ground water. The Water Quality Control Commission has heard testimony indicating that DIMP contamination has been detected in the surface and ground water within and outside the boundaries of the Rocky Mountain Arsenal, although ground water contamination exists in the greatest concentrations and is the most prevalent.

The Commission has heard evidence demonstrating that a significant quantity of ground water in the vicinity of the Rocky Mountain Arsenal is contaminated with DIMP. DIMP has been detected in certain drinking water wells located up to 5 miles downgradient of the Rocky Mountain Arsenal. In addition, the evidence indicates that DIMP-contaminated ground water near the Rocky Mountain Arsenal discharges to certain irrigation ditches and affects First Creek, a tributary to the South Platte River. For approximately the last three years, the State has been providing bottled water for consumption and cooking to residents and businesses whose wells were found to contain DIMP, although it is uncertain how long funds will be available to continue this program.

**b. Scope of Evidence and Information**

The Commission was presented with, and considered, a voluminous amount of evidence in this rulemaking. The majority of the evidence addressed the risk associated with exposure to DIMP and the toxicity of the chemical. The Commission heard approximately twenty-five hours of oral testimony from more than twenty witnesses for the Colorado Department of Health, the Army, the Shell Oil Company (Shell), the Arsenal Action Alliance, and the Environmental Protection Agency (EPA), as well as comments by members of the public and commentary by an expert advisory panel of toxicologists. The Commission received and considered literally thousands of pages of written testimony and exhibits from parties and the expert advisory panel. A Regulatory Analysis was prepared by Water Quality Control Division staff in response to a request by one of the parties. The Commission devoted a significantly greater amount of time in hearing testimony and considering written submissions, compared to the majority of water quality standard-setting proceedings it undertakes. Moreover, this hearing addressed the adoption of a water quality standard for a single contaminant, whereas most hearings address multiple pollutants and multiple segments.

Because of the importance of this proceeding, prior to the hearing the Commission took the unprecedented step of requesting that the parties and the Department of Health fund an independent expert advisory panel to provide testimony to the Commission on toxicology issues relating to DIMP. The expert advisory panel, which consisted of three toxicologists who were qualified to discuss risk assessment, assisted the Commission in objectively understanding the large volume of evidence regarding the toxicity of DIMP. The expert advisory panel provided a background educational briefing to the Commission, reviewed the written record, prepared a report for the Commission generally discussing the toxicity information and the different positions of the parties, attended the hearing and asked questions of witnesses, made an oral presentation to the Commission, and responded to questions from the Commission. The Commission found the explanation and clarification of the large amount of evidence by the expert advisory panel very helpful. In accordance with an agreement between the Department of Health, Shell and the Army, and upon advice by the Attorney General's Office, the panel did not advocate or offer a recommendation as to whether a water quality standard for DIMP should be adopted, or, if so, at what level.

Prior to these proceedings, there were no enforceable federal or state standards for DIMP. In 1989, the EPA's Office of Drinking Water issued a lifetime Health Advisory, which is not an enforceable standard, of 600 ug/l (micrograms per liter, also expressed as parts per billion) for DIMP. The EPA Health Advisory is based on a 1980 study of beagle dogs exposed to DIMP over a period of ninety days. [1]

The Department of Health initiated these water quality proceedings by requesting that the Commission adopt a statewide standard for DIMP of 8 ug/l, based on its evaluation of the relevant toxicology studies and selection of the 1979 Aulerich mink study [2] as the critical study upon which to base the water quality standard. In the Aulerich study, a significant number of female mink died over the course of their one year exposure to DIMP. Based on this and a more recent study with mink [3] , the Department of Health is concerned about the public health threat associated with DIMP exposure, particularly long-term or lifetime exposure, and derived its proposed standard to protect against these possible effects. In deriving its proposed standard of 8 ug/l for DIMP, the Department of Health followed EPA risk assessment methodology published in EPA's Integrated Risk Information System (IRIS) guidance. The Department of Health presented witnesses and exhibits supporting its recommended standard for DIMP of 8 ug/l. The State's consultant, Dr. Edward Calabrese, recommended a more stringent standard of 0.36 ug/l based on

the Aulerich study, but employed certain factors in deriving that recommendation which the Department of Health, based on its professional judgment and the IRIS guidance, chose not to incorporate in its derivation of the recommended standard.

The EPA provided a witness who explained the toxicological basis for that agency's DIMP Health Advisory, and also discussed other issues related to the toxicity of DIMP. The Army and Shell offered witnesses and exhibits supporting the EPA Health Advisory of 600 ug/l on a site-specific basis, although one witness for Shell supported a standard of 500 ug/l later in the proceedings.

The Arsenal Action Alliance provided testimony and exhibits supporting its recommendation that a DIMP standard of 0 ug/l be adopted by the Commission. This position was based largely on that entity's general policy concerns regarding toxins and pollutants in the environment, although it referenced as support Dr. Calabrese's 1990 report regarding DIMP toxicity. The Commission also heard considerable testimony from the public regarding the significant health concerns raised by the presence of DIMP in domestic water supplies.

Accordingly, the toxicological testimony supporting the various recommended standards primarily involved three studies, the 1980 Hart dog study lasting ninety days, the 1992 Bucci study with mink lasting ninety days, and the 1979 Aulerich mink study lasting one year. As the expert advisory panel acknowledged, interpreting the toxicological data from these and the other relevant DIMP studies in the risk assessment context involves professional judgment, and there were differing opinions among the various experts on behalf of the parties regarding the results of these studies.

One question that arose near the conclusion of this process was whether a transcript of the Commission's deliberations regarding the issues raised in this rulemaking proceeding should be made a part of the hearing record. The Commission has decided not to include the deliberations transcript in the record, because it believes that to do so may result in confusion regarding the basis for the Commission's ultimate determination. During deliberations it is typical for many perspectives to be offered and many options advanced and “tested” by individual Commission members. However, it is ultimately only this Statement of Basis, Specific Statutory Authority, and Purpose that accurately reflects the final views of the full Commission. It is this document that sets forth the basis for the Commission's decision, not some or all of the individual comments made during the deliberative process.

**c. Summary of Basis for Decision**

Following consideration of the extensive information briefly summarized above, the Commission has decided to establish a statewide interim surface water quality standard for DIMP at 8.0 ug/l, with an accompanying practical quantitation limit (PQL) of 1.0 ug/l. The ultimate basis for this decision is a policy judgment regarding what level of DIMP is protective of public health and the beneficial uses of water, in the face of credible but differing scientific interpretation of the information regarding the toxicity of DIMP.

The Commission has experienced considerable frustration in coming to the realization that the extensive information and data presented in the record does not lead to the identification of one scientifically “correct” value for the toxicity of DIMP upon which all experts can agree. EPA, which issued a lifetime Health Advisory for DIMP, has indicated that it has “low confidence” in the standard it recommends. Based upon the information provided by the parties, the public, and the Department of Health staff, and the explanations and clarifications of this scientific evidence provided by the expert advisory panel, it is the Commission's judgment that it is ultimately faced with a range of scientifically supportable interpretations of the evidence regarding the toxicity of DIMP. The Commission acknowledges that each of these interpretations carries with it a degree of uncertainty. In the face of this uncertainty, the Commission must exercise its policy judgment. Even a decision to adopt no standard for DIMP would entail substantial uncertainty — uncertainty as to whether public health and the beneficial uses of water would be adequately protected until better information might become available in the future.

Fully cognizant of the existing scientific uncertainty, the Commission has determined that there is a need for the adoption of a statewide surface water quality standard for DIMP at the level of 8 ug/l, in view of the

evidence submitted regarding the presence of DIMP in some waters of the State as described above and the evidence regarding the toxicological risk posed by DIMP (as discussed briefly above, and further discussed in section II of this Statement of Basis and Purpose). This standard is derived from the results of the 1979 Aulerich study. The Commission is concerned by the death of female mink observed at each dose level in that study, and cannot ignore these results. The Commission believes that the statewide standard of 8 ug/l is necessary to protect public health and the beneficial uses of waters of the State at this time, and that the standard is based on sound scientific and technical evidence in the record.

The Army and Shell have stated their belief that the Commission's selection of an 8 ug/l standard is based upon a public policy choice that “was not supported by the weight of the scientific evidence.” This assertion is a misleading characterization of the basis for the Commission's action. The Commission finds that there is substantial and sufficient scientific and technical evidence in the record to support this standard. The fact that other standards could also be defended from a scientific and technical standpoint based upon the information submitted does not mean that there is no such basis for the standard selected.

This Statement of Basis, Specific Statutory Authority, and Purpose does set forth “an evaluation of the scientific or technological rationale justifying the rule,” as required by the State Administrative Procedure Act. §24-4-103(4)(c). Indeed, in view of the importance of and controversy surrounding this determination, the Commission has taken pains to assure that this evaluation is substantially more extensive than that typically provided for the adoption of water quality standards. However, the Commission rejects the interpretation of the Administrative Procedure Act and Water Quality Control Act requirements implicit in the position advocated by the Army and Shell, which would appear to lead to the conclusion that whenever there is scientific disagreement or any remaining level of uncertainty regarding the appropriate standard to be adopted, the Commission is required to adopt the least stringent scientifically defensible standard. The Commission does not believe that this interpretation is mandated by law, and in fact believes that it would be contrary to the Commission's mission as set forth in the Water Quality Control Act.

The Commission previously considered the adoption of water quality standards for DIMP in January, 1991. The Commission eventually decided not to adopt any standards for DIMP as a result of that proceeding, in part based upon the representations of the Army that new DIMP toxicity studies then being conducted and scheduled for completion in 1992 would provide additional information that might address some of the uncertainty surrounding the interpretations of the studies completed prior to that time. It had been the Commission's hope that a new mink study of at least one year's duration, including at least one reproductive cycle for female mink, would be completed to essentially reassess the results of the 1979 Aulerich mink study, which was the focus of substantial debate in 1991 and again in this 1993 rulemaking hearing. Unfortunately, the additional studies conducted were not of a design or duration to provide this reassessment. Moreover, based upon the information presented in these proceedings it now appears unlikely that a new study of this scope, design and duration is likely to be completed in the foreseeable future. Therefore, the Commission believes that further delay or inaction on its part would be inappropriate. Accordingly, the Commission believes it must exercise its judgment based upon the information available now as presented in the 1993 rulemaking hearing, and adopt a standard to protect against the potential adverse health effects associated with DIMP exposure and to help ensure that DIMP does not become a more widespread threat to human health and the waters of the State.

This decision does not mean that the Commission is not open to reconsidering appropriate water quality standards for DIMP should additional relevant information become available in the future. Consistent with the Commission's practice for statewide standards for other organic chemicals, the DIMP standard is being adopted as an interim statewide standard. This standard is fully effective and enforceable once promulgated. However, the “interim” label recognizes the potential for future modifications should additional relevant information become available. In this regard, the Commission's statement concerning the adoption of interim statewide organic pollutant standards in 1989 applies here:

As new information becomes available and potential conflicts among the various numerical levels are resolved, it may be appropriate in specific instances in the future to adopt permanent standards either

more or less stringent than the interim standards being established at this time. However, given the importance of controlling toxic pollutants in the environment, the Commission believes that it is necessary to move forward with the adoption of interim statewide standards at this time, and that the interim standards adopted are reasonable based on the best currently available information.

**II. Selection of Numerical Level for Standard**

**a. Toxicological Basis**

As briefly described above, the Water Quality Control Commission has heard and considered substantial testimony and scientific evidence regarding the toxicity of DIMP and the risk associated with DIMP exposure. The Commission believes that a statewide interim standard for DIMP of 8 ug/l is necessary and appropriate to protect the citizens of Colorado and the waters of the State, and is based on sound scientific evidence as presented by the Department of Health and the parties to the hearing. The Commission's determination follows EPA risk assessment methodology, as applied to the available information regarding DIMP toxicity. In summary form, the Commission's substantive basis for adopting the 8 ug/l statewide standard for DIMP in surface water is described below.

There are no studies of human exposure to DIMP that can be used in deriving a health-based drinking water standard. Of the most relevant animal studies regarding DIMP toxicity, the Commission has identified the 12 month mink study undertaken by Aulerich, as the critical animal study from which to derive a water quality standard. The Commission believes this is the critical study because none of the other species of animal used in other DIMP studies are proven to be of superior extrapolative relevance to humans; the 12 month mink study had the longest duration of all the animal studies; the 12 month study used a relatively large number of animals; and, the mink in the 12 month study proved to be the most sensitive of all the animals exposed to DIMP (exhibiting an increasing linear mortality relationship to their exposure to DIMP). This selection of the critical study comports with accepted risk assessment principles, including EPA's IRIS guidance.

The Commission recognizes the disagreement among scientific experts regarding the cause of death of mink in the 1979 Aulerich study and the issues surrounding background mortality for mink. However, the Commission agrees with the expert advisory panel's conclusion that the possibility that the mink deaths resulted from administration of DIMP could not be ruled out. The Aulerich 12 month mink study is the only study lasting one full year. Although experts debate over the significance of the results of the Aulerich study, the Commission recognizes that a dose-response relationship was exhibited during the study. This fact is troubling and cannot be ignored from a public health perspective, particularly because the end-point was mortality. No other studies to date have addressed female mink exposed before, during and through the reproductive cycle. The Commission also recognizes that adverse blood effects, among others, were observed in mink in the 90 day Bucci study, and that these effects were still increasing in severity when the study was completed at 90 days.

Given the Aulerich study's statistically significant mortality rate at the highest dose level, the statistically significant linear dose-response relationship across all doses, and the highly biologically significant end-point, the Commission believes it is an appropriate scientific and policy decision to base the DIMP standard of 8 ug/l on the information available currently to the Commission regarding mortality in female mink. The Commission recognizes that there was a difference of opinion among experts in the hearing regarding the relevance of the linear regression (trend) analysis of mortality across the different dose levels to select a Lowest Observed Adverse Effect Level. One member of the expert advisory panel commented that such trend analysis could result in more false positive conclusions compared to other relevant statistical tests. Recognizing this concern as well as the advantages of trend analysis, the difference of opinion among experts, and that the end-point was mortality in female mink, the Commission has chosen to use this potentially more conservative approach as part of its analysis.

The Commission recognizes there was considerable debate in the testimony regarding whether to incorporate in the statistical analysis of the 1979 Aulerich DIMP study the female mink deaths observed in the control group of a parallel 1979 study with dicyclopentadiene (DCPD). The expert advisory panel

discussed the results of the DCPD study and noted that, because of atypical circumstances, they "should be factored in the overall analysis" of the results of the Aulerich DIMP study. The Commission has considered this information, as well as countervailing evidence presented that it is unorthodox to use data from a different study to statistically evaluate the results of the primary study that is being considered, and that statistical comparison using the concurrent control group from the primary study is the norm. There was evidence both supporting and challenging the notion that the two studies were sufficiently similar to allow their respective results to be commingled. There is considerable professional judgment involved in evaluating the available data in risk assessment, and the Commission is concerned by the direct linear increase in female mink mortality observed between the control group and the successive treatment groups in the 1979 Aulerich DIMP study. Considering the above, the Commission has decided to follow scientific convention and use only the data from the 1979 Aulerich DIMP study to evaluate the death of female mink in that study.

With the selection of the Aulerich study as the critical study, following accepted risk assessment guidance, the Commission derives the recommended standard as follows:

(1) The Lowest Observable Adverse Effect Level (LOAEL) [4] in the 12 month mink study was at the 11 mg/kg/day dose level (the lowest dose) because at this dose level the end-point of concern (female mink mortality) was both statistically and biologically significant. [5]

(2) In accordance with EPA methodology for risk assessment, the relevant Uncertainty Factors to be applied to the LOAEL of 11 mg/kg/day in the Aulerich study are: (i) interspecies variation, (10), (ii) intra-species variation (10), (iii) less than lifetime exposure (10), and (iv) conversion from LOAEL to NOAEL (10), for a total Uncertainty Factor of 10,000.

(3) The Commission recognizes that the LOAEL identified in the critical study was for death in female mink. This critical effect level, therefore, is actually a Frank Effect level [6] . Given that the endpoint was a Frank Effect Level and not a subtle, reversible toxic effect, and that the critical study has not been replicated to verify the results or better characterize the biological response in that study, it is appropriate to consider the application of a Modifying Factor [7] . The Commission chooses to follow the professional judgment of the Department of Health that in this instance the appropriate Modifying Factor is 1 because of the overall protection provided by the four Uncertainty Factors adopted by the Commission, although it appears that the evidence could also support a larger Modifying Factor. Therefore, the total Uncertainty Factor of 10,000 will not change based on the Modifying Factor.

(4) Deriving a safe human dose, commonly referred to as the Reference Dose (or RfD), the LOAEL is divided by the final total Uncertainty Factor of 10,000.

$$\frac{11 \text{ mg/kg/day}}{10{,}000} = 0.0011 \text{ mg/kg/day}$$

(5) The water quality standard is derived using standard EPA methodology - multiplying the Reference Dose by (i) the average adult body weight of 70 kg and (ii) the relative source contribution from water of 20% (0.2), and then dividing this figure by (iii) the average drinking water consumption of 2 liters/day.

$$\frac{0.0011 \text{ mg/kg/day} \times 70 \text{ kg} \times 0.2}{2 \text{ l/day}} = 0.0077 \text{ mg/l.}$$

0.0077 mg/l = 7.7 ug/l, which is rounded to <u>8 ug/l</u>.

Based on the information available and evidence presented during these rulemaking proceedings, the Commission believes the statewide surface water standard for DIMP of 8 ug/l is necessary, scientifically justified and supported by the record. Also, as described above, the Commission has fully considered the

relevant evidence regarding the risk associated with the pollutant, and the extent of such pollution to be tolerated as a goal, in deciding to adopt the standard for DIMP of 8 ug/l.

**b. Technological Basis**

Based on evidence presented to the Commission in these proceedings, the Commission believes it is technically and economically feasible and practical to treat water contaminated with DIMP with granular activated carbon to achieve a DIMP effluent concentration in water of 8 ug/l or less. There is evidence in the record that other treatment technologies might also be practical and technically and economically feasible to achieve the adopted standard.

The Commission recognizes that the Army and Shell are currently undertaking ground water remediation at and near the Rocky Mountain Arsenal employing granular activated carbon; that their existing ground water treatment systems are treating ground water for DIMP prior to discharge and are capable of achieving the adopted DIMP standard of 8 ug/l; that the existing ground water treatment systems may have to be reconfigured or costs associated with those systems may be increased; and that, if adopted as an applicable or relevant and appropriate requirement under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remediation process or applied as a standard pursuant to any other law, new or additional ground water treatment systems may be required of the Army and Shell in order to meet the adopted statewide surface water standard for DIMP, due to the hydrological connection between ground and surface water. The Commission recognizes that costs may be associated with meeting the adopted standard if DIMP is discovered in surface water elsewhere in the State. [8] It is the hope of the Commission that public health and the waters of the State can be protected in a cost-effective manner when the standards it adopts are applied in any regulatory or remedial context. However, the Commission finds that in general the costs associated with compliance with the adopted DIMP standard, wherever compliance may be required, will be counter-balanced by the public health and water quality benefits achieved.

**c. Consideration of Statutory Requirements**

As described in part above, in promulgating the statewide ground and surface water quality standards for DIMP, the Commission has considered the factors enumerated in Section 25-8-204(4), C.R.S. The Commission has considered evidence regarding the extent of DIMP contamination and the risk associated with DIMP exposure. The Commission is aware that DIMP is a non-naturally occurring pollutant and it is also a “continuous” pollutant in the ground water (versus “intermittent” or “seasonal”) in the currently known affected area, which has resulted in detection of some impact on surface waters in the area. The Commission has also considered the technical evidence regarding treatment, and has concluded that treatment techniques to achieve the statewide standard of 8 ug/l are available, practical, and technically and economically feasible. As discussed above, the Commission recognizes the potential economic impacts associated with the adopted standard for DIMP, but believes these potential impacts will be counter-balanced by the public health and water quality benefits achieved. No evidence was submitted indicating that treatment for DIMP would have a significant impact on water quantity. Based on all the evidence presented, as summarized above, the Commission believes that there is a strong need for a statewide standard for DIMP of 8 ug/l at this time to support the beneficial uses of State waters, including drinking water, and that the standard adopted is appropriate and scientifically supported by the record.

**d. Senate Bill 181 Requirements**

Colorado Senate Bill 181, adopted in the 1989 legislative session and codified in part in Section 25-8-202(8)(a), C.R.S., includes provisions that apply when the Commission adopts “rules more stringent than corresponding enforceable federal requirements.” In the 1989 revision to the Basic Standards and Methodologies for Surface Water 3.1.0 (5 CCR 1002-8), the Commission interpreted these provisions to be inapplicable to the rulemaking since there were no “corresponding enforceable federal requirements” that establish ambient surface water quality standards. Likewise, the provisions of C.R.S. Section 25-8-202(8)(a) are inapplicable to the proposed rulemaking on DIMP because, as stated above, there are no

enforceable federal requirements for DIMP. Even if Section 25-8-202(8)(a) were applicable, the Commission finds that the standard adopted is based on sound scientific and technical evidence in the record.

**III. Decision to Adopt a Statewide Standard**

In establishing a statewide standard for DIMP the Commission has determined that DIMP should be controlled on a statewide basis, wherever it is found in the waters of the State, within or outside the Rocky Mountain Arsenal. While the present known contaminated area is limited, the Commission recognizes that the ultimate clean-up and remediation actions for the Rocky Mountain Arsenal may not be finally determined, or may not be put in place, for many years. In establishing a statewide standard, the Commission also intends to ensure that future disposal and handling practices associated with the clean-up and remediation do not adversely affect surface or ground water resources anywhere in the State, and that new contamination problems associated with DIMP do not arise elsewhere in the future.

Much of the rationale for the Commission's 1989 adoption of statewide standards for organic chemicals applies with respect to DIMP (see, Section 3.1.22; revised in 1991, Section 3.1.23). The Commission believes that as a matter of policy all potential beneficial uses of water should be protected on a statewide basis from potential contamination from non-naturally occurring organic chemicals. This policy was reflected in the Commission's 1989 adoption of statewide standards for surface and ground water for approximately 55 organic chemicals. The current adoption of the DIMP standard is a consistent extension of this policy. As with the other organic chemicals, DIMP is a non-naturally occurring pollutant for which a statewide standard is appropriate. Unlike certain other potential pollutants, there is no need to take natural background levels for DIMP into account on a site-specific basis in adopting standards. DIMP is a “continuous” pollutant in the ground water at and near the Rocky Mountain Arsenal, with an estimated half-life of over 500 years, and this ground water is hydrologically connected to area surface water so the adoption of a statewide standard that applies at all times, and that protects future water supplies, is appropriate. As Water Quality Control Division staff testified, there are other statewide standards for chemicals that exist in limited areas of the State, such as chlorobenzene, for example.

The Commission also intends to set a statewide standard in order to protect any state waters that are not yet known to have DIMP contamination, if any are found to exist. The Commission intends that the standard should be applied uniformly wherever DIMP may be a concern in the State, currently or in the future, and that the standard is generally applicable and legally enforceable throughout the State pursuant to statute and associated regulations.

The parties to the hearing have expressed differing opinions regarding the Commission's intent on how its statewide water quality standards will be used as cleanup standards in other statutory programs. In a letter to the Commission, Shell appears to interpret Sections 3.11.5(C)(5)(a) (regarding statewide ground water standards) and 3.1.11(5) (regarding statewide surface water standards), 5 C.C.R. 1002-8, of the Commission's regulations to mean that the Commission “did not intend” for its standards to be applicable or relevant and appropriate requirements (ARARs) under CERCLA (i.e., cleanup standards) or to be enforced as cleanup standards under other statutes. Shell interprets those sections to mean that the Commission believes “it is in the discretion of other agencies” to apply or ignore the statewide standards as cleanup standards, and that the Commission intended to “specifically defer to the discretion of other agencies in setting cleanup levels at Superfund sites.” This is an inaccurate expression of the Commission's intent. Instead, the Commission intends for its standards to be used as cleanup requirements, including at CERCLA sites, except in the limited circumstances where “ <u>a determination</u> is made that such a variation <u>is authorized</u> pursuant to the applicable provisions” of those federal statutes [ § 3.11.5(C)(5)(a); § 3.1.11(5)].

These cited sections were added to the Commission's regulations in 1989 as simple clarifying statements to address potential conflicts between the Commission's statewide standards and other remediation requirements under the federal programs. The Commission is simply stating that it does not attempt to preempt a federal law, such as CERCLA, by mandating the use of its specific water quality standards as cleanup standards in instances where the federal program is <u>authorized</u> to use a different standard, more

or less stringent, and where such programs dictate that the different standard be applied. See e.g., § 3.1.22 (F). The Commission's regulations do not provide that any agency has open-ended discretion to choose to apply or disregard the Commission's standards as cleanup requirements. The Commission intends for its standards to be used as cleanup standards; the Commission understands that in certain federal programs, such as CERCLA, the federal agency can waive a state standard, but only if certain specific statutory requirements have been met. From the Commission's perspective, the standards cannot be waived based on the federal agency's mere discretion whether to use them or not.

**IV. Selection of a Practical Quantitation Limit**

The Commission has heard testimony from the Department of Health's Laboratory on its routine analytical capability and procedure for DIMP analysis, and has determined that the Practical Quantitation Limit (PQL) for DIMP should be set at 1.0 ug/l. The Commission credited the testimony that the Department of Health Laboratory has devised a reliable and effective methodology for analyzing DIMP. The Commission also considered the evidence that the Army has been reporting levels of DIMP above .392 ug/l since 1988, demonstrating that the Department of Health Laboratory's PQL could be reproduced by other laboratories. The basis for this PQL is consistent with that underlying PQLs for other statewide organic chemical standards. Because the adopted standard is higher than the PQL of 1.0 ug/l, this value should have little practical significance.

PARTIES TO THE RULEMAKING HEARING

1. Colorado Department of Health
2. United States Department of the Army
3. South Adams County Water and Sanitation District
4. Shell Oil Company
5. Arsenal Action Alliance

**31.31 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE: JULY 11, 1994 HEARING**

The provisions of C.R.S. 25-8-202(1)(1), (b); provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

**BASIS AND PURPOSE**

**3.1.8 Antidegradation Rule**

Changes were made to several portion of the rule to clarify that the basis for designating waters and making determinations whether significant degradation will occur were the chronic criteria or standards except in those instances where the parameter of concern had only an acute criteria or standard.

One party requested an amendment to §3.1.8(2)(b)(i), asserting that the current language did not comport with C.R.S. §25-8-209(4). However, given the fact that this particular provision was recently adopted in response to a 1992 legislative change, and in view of the fact that the Basic Standard changes under review at this time focus upon numeric criteria, it was decided to defer this particular issue. It may be considered at the next Basic Standards triennial review, or prior to that time if a separate rulemaking addressing antidegradation is noticed by the Commission.

**3.1.11 Basic Standards applicable to Surface Waters of the State**

The Commission updated the organic chemical table to reflect new chemicals and revised numeric standards and criteria contained in revisions to the Federal Drinking Water Standards and/or updates to the 304(a) criteria for pollutants that have occurred since the 1991 Basic Standards rulemaking.

During the hearing, a number of parties raised concerns about the basic standards applicable to the water supply and water plus fish classifications for chloroform, bromoform, bromodichloromethane and dibromochloromethane. These substances are collectively known as total trihalomethanes (THMs) and are found in most treated drinking water supplies. The substances are contained in drinking water as a result of chlorination of raw water supplies in water treatment facilities. As a result of the discharge of treated drinking water, after use, into wastewater treatment systems, untreated and treated wastewater may contain the substances, particularly chloroform, in excess of the established basic standards levels.

The rationale for limiting trihalomethanes in waters of the State is to protect human health from adverse effects when water is ingested. The existing standards for the four substances were based on calculations from the EPA's Integrated Risk Information System (“IRIS”). The Safe Drinking Water Act and the implementing regulations set a maximum contaminant level (MCL) in finished potable water for total THMs at 100 ug/l, which is significantly higher than the current basic standard of 6 ug/l for chloroform. No maximum contaminant levels have been established for the four individual substances. The Commission recognizes that continued chlorination of drinking water supplies is necessary to control water-borne bacteria and to provide a safe drinking water supply. The Commission also recognizes that to meet the established standards for the four chemicals wastewater treatment works could be required to treat their wastewater at very significant costs to levels below that allowed in drinking water. In general, the Commission's policy has been to limit the occurrence of pollutants in state waters to the lowest feasible levels, consistent with the latest available information regarding full protection of public health. In this instance, in view of the fact that these pollutants may be present due to necessary water supply chlorination, and in view of the potential treatment costs and the existence of the total THM drinking water standard, the Commission has decided to replace the water supply and water plus fish standards for chloroform, bromoform, bromodichloromethane and dibromochloromethane with a total trihalomethane standard of 100 ug/l. This change is being made due to the unique circumstances pertaining to these chemicals, and should not be interpreted as a precedent for other instances where health-protective standards are more stringent than adopted MCLs. The Commission also anticipates that the standard now being adopted may be tightened in the future if, as currently expected, EPA revises the current total THM MCL to make it more stringent. The aquatic life standards for bromodichloromethane and chloroform have not been changed.

A determination was made that the practical quantitation limits (PQL's) were more appropriately addressed in the Regulations for the State Discharge Permit System in order to allow more flexibility in their application in permits and the PQL column and all footnotes referencing them were removed from the table.

Other changes to the table were to expand upon the footnote concerning the application of the water and fish ingestion standards to class 2 aquatic life segments and to correct typographical errors in the spelling of several chemicals.

### 3.1.16 Tables

Changes to this section included revising and updating the references, and adjusting the water supply criterion for asbestos in Table II and cadmium, nickel, selenium, and thallium in Table III to reflect updated standards in the National Primary Drinking Water Regulations. No revisions to the aquatic life table values for selenium were made as a result of this hearing. A separate rulemaking hearing to consider these issues has been scheduled for October, 1994.

A new class of criteria for metals which address water + fish ingestion was also added to Table III. Water + fish criteria were adopted for antimony and thallium that were equivalent to their respective drinking water supply criteria since their human health based water + fish values were slightly higher. The specific drinking water criteria used are the current “maximum contaminant level goals” for these two metals. As a result of issues raised during this hearing, the Commission intends to review the policy issues related to selecting the basis for human health-based table values and water quality standards. Should the Commission adopt an approach to such table values and standards in the future that differs from that applied in this hearing, the Commission may adjust these antimony and thallium table values at a future

hearing. Footnotes concerning application of these criteria as standards to segments were adopted verbatim from the organic chemical table in 3.1.11.

The Commission considered the proposal of various parties to delete the chronic and chronic (trout) table values for silver. The evidence demonstrated that ionic silver causes chronic toxicity to fish at levels below that established by the acute table values. It was undisputed that silver is present in Colorado streams and in the effluent of municipal and industrial dischargers in Colorado. The evidence also demonstrated that the removal of silver from wastewater can be costly. However, there was strongly conflicting scientific evidence regarding the degree to which silver does, or could in the absence of chronic standards, result in actual toxicity to aquatic life in Colorado surface waters. In particular, there was conflicting evidence regarding the degree to which the toxic effects of free silver are mitigated by reaction with soluble ligands to form less toxic compounds and by adsorption to particulates and sediments.

The Commission believes strongly that there is a need for additional analysis of the potential chronic toxicity of silver in streams in Colorado. The Commission encourages the participants in this hearing, and any other interested parties, to work together to develop additional information that will help resolve the differences in scientific opinions that were presented in this hearing. The Commission believes that it should be possible to develop such information within the next three years.

In the meantime, the Commission has decided as a matter of policy to take two actions. First, the chronic and chronic (trout) table values for silver are repealed for the next three years. The Commission intends to implement this action by also repealing for the next three years, in a separate rulemaking hearing to be held later this year, all current chronic table value standards for silver previously established on surface waters in Colorado. Any acute silver standards and any site-specific silver standards not based on the chronic table values would remain in effect. The Commission intends that any discharge permits issued or renewed during this period will not include effluent limitations based on chronic table value standards, since such standards would not currently be in effect. In addition, at the request of any discharger, any such effluent limitations currently in permits should be deleted.

The second action being taken by the Commission is the readoption of the chronic and chronic (trout) table values for silver, with a delayed effective date of three years from the effective date of this final action. The Commission also intends to implement this action by readopting chronic silver standards with a corresponding delayed effective date at the same time that such standards are deleted from the individual basins as described above. The Commission has determined that this is an appropriate policy choice to encourage efforts to reduce or eliminate the current scientific uncertainty regarding in-stream silver toxicity, and to assure that Colorado aquatic life are protected from chronic silver toxicity if additional scientific information is not developed. If the current scientific uncertainty persists after three years, the Commission believes that it should be resolved by assuring protection of aquatic life.

In summary, in balancing the policy considerations resulting from the facts presented in this hearing, the Commission has chosen to provide relief for dischargers from the potential cost of treatment to meet chronic silver standards during the next three years, while also providing that such standards will again become effective after three years if additional scientific information does not shed further light on the need, or lack of need, for such standards.

The Commission also has revised the drinking water supply table value for silver, to reflect the current secondary drinking water standard, since EPA has deleted the previous maximum contaminant level for silver.

At the hearing, Coors requested that the Commission consider adopting language stating that the Division should not use secondary drinking water standards as the basis for discharge permit limits if the background levels exceed those standards and if there are no site-specific numeric standards based upon ambient data adopted for the constituents in questions. Coors and the Division have discussed the issue and have resolved it for the time being without the need for Commission action on the request at this time. Coors agreed not to pursue this issue in the current rulemaking, but anticipates that its concerns

will be addressed in a subsequent hearing that will consider the adoption of site-specific standards on Clear Creek.

**Other**

Changes were made to section 3.1.7(b)(ii) which specify procedures appropriate in the development of site-specific standards and to section 3.1.14(7) to allow the adjustment of effluent limits for metals if a site-specific relationship can be shown for instream dissolved and total recoverable metals. Both these changes are being made in response to recent EPA policy concerning the development and application and of metals standards.

The definition of created wetlands was changed to clarify that compensatory wetlands were not included in this class of wetlands.

PARTIES TO THE JULY 11, 1994 HEARING

1. Sierra Club and Colorado Environmental Coalition
2. City of Colorado Springs
3. Conoco, Inc.
4. Shell Oil Co.
5. Metro Wastewater Reclamation District, the City of Fort Collins, the Silver Coalition, and the Cyprus Climax Metals Company
6. Coors Brewing Company
7. City of Pueblo
8. ASARCO, Inc.

## 31.32 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: OCTOBER, 1995 HEARING

The provisions of C.R.S. 25-8-202(1)(b) and (2); 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

**BASIS AND PURPOSE**

**A. Aquatic Life Table Values for Selenium**

The aquatic life table value criteria for selenium are being changed from 135 ug/l acute and 17 ug/l chronic to 20 ug/l acute and 5 ug/l chronic respectively. These values, which are measurements of waterborne selenium, will serve as interim guidance for the Commission in establishing numeric standards for specific basins and individual stream segments. The new interim numeric criteria are based upon EPA's 1987 Selenium Criteria Document. The EPA selenium criteria values of 5 ug/l chronic and 20 ug/l acute are not expected to be the appropriate standards for each and every waterbody within Colorado. Appropriate site-specific standards may be different than these table value numbers. These numbers may no longer represent the latest scientific evidence for all cases. Bioaccumulation may occur at higher or lower water column concentrations of selenium depending upon a variety of factors. Nutrient enrichment, productivity of primary producers, selenium speciation, pond residence time and other factors influence bioaccumulation. Several parties argued that the EPA criteria are unnecessarily stringent to protect aquatic life in many Colorado streams, while the U.S. Fish and Wildlife Service urged the adoption of a chronic table value of 2 ug/l to assure adequate protection.

Information was presented at the rulemaking hearing that the field studies which support the EPA criteria may not be directly transferrable to Colorado streams and reservoirs. Certain Colorado segments currently have elevated selenium levels, yet there is no apparent evidence of adverse impacts upon aquatic life or wildlife. Selenium in the aquatic environment exhibits a strong association with particulate organic matter and, as a result, measurements of waterborne concentration can be an unreliable

predictor of bioaccumulation and the subsequent potential for adverse biological effects. Some research indicates that particulate selenium (i.e. selenium associated with detritus sediment or suspended particulate matter) is a more reliable predictor of these effects. Pending further study, the table values are used as an interim guideline.

In accordance with Section 3.1.7 of the Basic Standards and Methodologies for Surface Waters, the selenium table values are intended to guide the Commission and others at site-specific standard-setting hearings. These values are generally considered to protect the beneficial use classifications, but are not presumptively applicable to site-specific stream segments prior to or during the course of subsequent triennial review or segment specific rulemakings. The site-specific standard-setting process is a more appropriate vehicle for identifying and weighing the many variables influencing selenium toxicity.

Given the potential for significant site-specific differences in bioavailability and subsequent effects, the naturally high concentrations of selenium in some Colorado water bodies, the lack of evidence of adverse impacts to Colorado ecosystems despite such elevated levels, and the difficulty in remediating selenium contributions from natural and nonpoint sources, the Commission has added a footnote to the TVS which explicitly states: “Selenium is a bioaccumulative metal and subject to a range of toxicity values depending upon numerous site-specific variables.” This footnote recognizes the opportunity to develop ambient or site-specific water quality standards on a basin-by-basin or specific segment basis. This can be accomplished in a number of ways, including the adoption of ambient or site-specific standards under Section 3.1.7(1)(b), or pursuant to other scientifically defensible methods. No single appropriate site-specific method has been identified to date.

The Commission will reconsider this interim standard and the availability of site-specific standard setting methods in subsequent reviews of this regulation. In the meantime, the Commission strongly encourages statewide cooperative efforts to (i) define potential biological thresholds, (ii) consolidate fish population data bases, and (iii) provide specific Colorado guidance for the development of methodologies for derivation of site-specific standards. The Commission urges all participants in this hearing, including the U.S. Fish and Wildlife Service, to assist in this effort. It is apparent that the determination of appropriate water quality standards for selenium is an extremely complex technical issue that warrants a broad-based effort if an appropriate long-term resolution is to be achieved. The absence of guidance and/or methods for the development of site-specific standards shall be considered by the Commission during subsequent reviews in determining whether to retain this interim standard. The next triennial review informational hearing for this regulation is currently scheduled for July, 1996, with any subsequent rulemaking hearing likely to be scheduled 6 to 12 months later.

Site-specific standards may be based upon considerations of site-specific factors including, but not limited to, ambient selenium concentrations, selenium speciation, sulfate antagonism, sediment and water column interaction, food web structure, stream gradient and temperature, seasonal stream flows, geohydrology, hydrologic residence time and evaporation rates, selenium sensitivity of the aquatic life present or to be protected, the diversity and density of the aquatic life present, conditions conducive or not to bioaccumulation, presence of toxic effects, risk of sublethal effects taking into consideration habitat limitations or other water quality factors, and the availability, practicality, technical and economic feasibility of point and nonpoint source treatment techniques, as well as other factors enumerated in C.R.S. 25-8-204(4).

During the hearing, one party urged the Commission not to apply the new selenium table values to cold water aquatic life streams above 7,000 feet in Colorado but rather to retain the existing table value criteria for these waters. The Commission has decided as a matter of policy that these issues are better addressed in site-specific standard-setting hearings, rather than addressing them in a hearing on table value criteria. As indicated in the preceding paragraph, site-specific factors such as geology, stream gradient and temperature, ambient selenium levels and other conditions conducive to bioaccumulation can be considered in standard-setting hearings.

Extensive testimony was received concerning the natural, as well as nonpoint source nature of selenium loading of streams. These sources will necessitate long-term water quality planning processes. Testimony

was presented on the need for Total Maximum Daily Load determinations and allocation of mass loading among point and nonpoint sources. This implementation process is separate from the setting of the standard and may require additional planning processes and efforts by the Commission and Division once standards are set.

Finally, the Commission notes that a selenium standard need not be adopted during the course of triennial review or segment specific rulemakings unless it is determined that the discharge or presence of selenium in the affected waters reasonably could be expected to interfere with the classified uses adopted for the affected waters. Where it is determined that the presence of selenium reasonably could be expected to interfere with classified uses, appropriate action shall be taken in conjunction with a site-specific or a basin-wide rulemaking hearing.

**B. Agriculture Table Value for Selenium**

The notice for this rulemaking also proposed that the current agriculture table value for selenium be changed from 20 ug/l to 50 ug/l based on levels needed for protection of livestock. However, in this hearing the Commission was not presented with substantial scientific information demonstrating that 50 ug/l of selenium would be protective of agriculture uses. Therefore, the Commission has declined to modify the current agriculture table value at this time.

PARTIES TO THE OCTOBER 11, 1995 HEARING

1. Northern Colorado Water Conservancy District and Municipal Subdistrict
2. Metro Wastewater Reclamation District
3. Climax Metals Company
4. Conoco, Inc.
5. City of Colorado Springs
6. City of Pueblo
7. The Board of Water Works of Pueblo
8. Total Petroleum, Inc.
9. United States Department of the Interior, Fish and Wildlife Service
10. Colorado Division of Wildlife
11. The Southern Ute Indian Tribe
12. The Southwestern Water Conservation District
13. Southeastern Colorado Water Conservancy District
14. High Country Citizens' Alliance
15. Tri-Lakes Wastewater Treatment Facility Joint Use Committee
16. Northwest Colorado Council of Governments
17. U.S. Environmental Protection Agency's Region VIII
18. Colorado River Water Conservation District
19. Western Slope Environmental Resource Council

## 31.33 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: DECEMBER, 1996 HEARING

The provisions of C.R.S. 25-8-202(1)(b) and (2); 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

**BASIS AND PURPOSE**

**1. Summary**

In this rulemaking proceeding, the Commission adopted a revised basic standard for surface water for plutonium (Pu) and established an additional basic standard for surface water for americium (Am).

2. **Background**

The Commission previously adopted a basic standard for plutonium of 15 pCi/L and had no basic standard for americium. A basic standard was considered in this hearing for americium because it is closely associated with plutonium and these two radionuclides generally occur together. The current basic standard of 15 pCi/L plutonium was calculated using methodologies in the 1976 National Interim Primary Drinking Water Regulations and was consistent with a goal of keeping exposures below 4 millirems per year. The Basis and Purpose indicated that it was necessary and important to restrict levels because of the difficulty of removing this radionuclide by conventional treatment procedures and because the potential adverse effect on human health suggests that extreme caution be exercised in its release to State waters. Since plutonium is predominantly an alpha emitter, the basic standard was made consistent with the 15 pCi/L alpha standard. (A site-specific standard, based on ambient conditions, was set in 1990. Note that this hearing also addressed site-specific standards, which are further discussed in section 3.8.48 of this Statement of Basis and Purpose.)

3. Basis for **Commission** Decision

Since the previous basic standard was set, several changes have occurred: 1) a new methodology for assessing carcinogens has become the standard practice, 2) new data have resulted in periodic updates to the slope factors used in this methodology, and 3) a more refined Commission policy on appropriate levels of protection for carcinogens has been developed. This latter risk-based policy also parallels a national trend towards risk-based approach to environmental cleanup standards.

The 15 pCi/L dose-based approach was calculated using a “reference-man” and considered exposure during his working life. It was an approach designed to address questions related to occupational exposure. It did not consider sex, age and organ-specific factors over a lifetime. In contrast, the new slope factor methodology, used in EPA's 1989 Risk Assessment Guidance for Superfund Sites, is more complete, more applicable to a general population and has become the standard practice for calculating risk.

The Commission adopted a basic standard of 0.15 pCi/L for plutonium and americium, calculated using a 1 ×t;10 $^{-6}$ risk level, based on residential use. This risk level is consistent with the Commission's policy for human health protection.

PARTIES TO THE RULEMAKING

1. State of Colorado Division of Wildlife
2. U.S. Department of Energy
3. Kaiser-Hill Company, LLC
4. City of Broomfield
5. City of Westminster
6. U.S. EPA Region VIII
7. City of Thornton
8. City of Arvada
9. City of Northglenn

## 31.34 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JULY, 1997 RULEMAKING

The provisions of sections 25-8-202 and 25-8-401, C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE**

The Commission has adopted a revised numbering system for this regulation, as a part of an overall renumbering of all Water Quality Control Commission rules and regulations. The goals of the renumbering are: (1) to achieve a more logical organization and numbering of the regulations, with a system that provides flexibility for future modifications, and (2) to make the Commission's internal numbering system and that of the Colorado Code of Regulations (CCR) consistent. The CCR references for the regulations will also be revised as a result of this hearing.

## 31.35 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; NOVEMBER, 1997 RULEMAKING

The provisions of sections 25-8-202(1)(b). 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

### BASIS AND PURPOSE

### 1. Manganese Table Vales

The current Colorado aquatic life table value for manganese of 1,000 µg/l is based on limited laboratory toxicity test data generated by the Colorado Division of Wildlife (CDOW) in the 1970's (Davies and Goettl 1976). The revised table values adopted in this hearing are based on more recent data obtained from several sources (i.e., CDOW, ENSR, et al.) providing greater insight into the toxicological properties of manganese to aquatic organisms. The database, upon which the new table values are based, contains more than 25 acute and chronic toxicity data points representing approximately eight freshwater quality species. The USEPA has not developed national ambient water quality criteria for manganese. The new state table value criteria are based on the USEPA's guidance for deriving ambient water quality criteria, i.e., Guidelines for Developing Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses (USEPA 1985).

Laboratory test results indicate that manganese toxicity is affected by water hardness — an observation consistent with many metals included on Table III of the Basic Standards. The proposed acute and chronic revisions to the table values are water hardness-based equations rather than the current single value, reflecting the mitigating effect of water hardness on manganese toxicity and the differences in toxic effects resulting from acute (short-term) and chronic (long-term) exposures.

### 2. Correction of Typographical Errors

The listings of standards for the following organical chemicals were revised in this hearing, to correct previous typographical errors: Chlorethyl ether (BIS-2) [c] ; Chloroisopropyl ether (BIS-2); 4-Chloro-3-methylphenol; Chlorophenol 2; Di-n-butyl phthalate; Dinitrotoluene 2,6; Nitrosodiphenylamine N [2] ; and Trichlorobenzene 1,2,4.

### 3. Silver Table Values

As the result of a 1994 rulemaking hearing, the Commission repealed the aquatic life chronic and chronic (trout) table values for silver that had been contained in Table III of this regulation, but also readopted these same table values, with a delayed effective date of March 2, 1998. The Statement of Basis and Purpose for that rulemaking action stated in part: “The Commission has determined that this is an appropriate policy choice to encourage efforts to reduce or eliminate the current scientific uncertainty regarding in-stream silver toxicity, and to assure that Colorado aquatic life are protected from chronic silver toxicity if additional scientific information is not developed.”

In the present rulemaking proceeding, the Silver Council, the City of Colorado Springs, the City of Fort Collins, Climax Molybdenum Company, and Kodak Colorado Division proposed that the Commission should delete the chronic and chronic (trout) silver table values from Table III, arguing (among other

things) that there is no need for these table values. As an alternative proposal in this rulemaking, the Division of Wildlife proposed that the Commission should replace the existing chronic and chronic (trout) table values for silver with a single new chronic table value (in the form of a new hardness-based equation) that in general would be more restrictive than the previous table values. The Water Quality Control Division proposed that the Commission should take no further action regarding aquatic life chronic table values for silver at this time, thereby allowing the previous table values to go back into effect.

After consideration of the extensive information presented in this hearing on this issue, the Commission has decided to take no action regarding aquatic life chronic table values for silver at this time, with the result that the previously adopted chronic and chronic (trout) table values will go back into effect on March 2, 1998. The Commission finds that the record of this rulemaking proceeding, taken as a whole, demonstrates the need for chronic silver table values (and, correspondingly, chronic water quality standards) to protect aquatic life. The evidence submitted does not demonstrate that Colorado aquatic life would be protected from silver toxicity in the absence of chronic standards, or that the adoption of more restrictive standards is appropriate at this time.

The Commission rejects the Silver Council's argument that the presence of low levels of silver in ambient waters in Colorado is grounds for the deletion of the chronic and chronic (trout) table values. Table values (and corresponding segment-specific standards) are established to protect beneficial uses from the adverse effects of pollutants that are currently or may in the future be discharged to Colorado streams. It is undisputed that silver is present in current point source discharges to Colorado waters. Therefore, it is appropriate to establish table values that will assure that such discharges do not in the future cause elevated levels of in-stream silver that would cause toxicity to aquatic life, even if in most instances current ambient concentrations are not at a level anticipated to cause impacts. The evidence in this hearing does not demonstrate that silver is removed or bound by either inorganic or organic complexing material (ligands) and/or sediments to the extent necessary to eliminate chronic toxicity to aquatic life.

The Commission has considered the factors enumerated in section 25-8-204(4), C.R.S., and believes that they support the decision not to delete chronic table values for silver.

The evidence demonstrated that cities such as Golden, Colorado Springs and Fort Collins have successfully established pretreatment programs that achieve compliance with silver effluent limits in their discharge permits. Moreover, if ambient standards resulting from these table values would result in a substantial economic impact to a particular discharger on a site-specific basis, a number of options may be available in establishing appropriate site-specific standards, as provided in section 31.7(1)(b)(iii) of this regulation. As a policy matter, the Commission believes that it is appropriate to consider any such site-specific economic impacts in a site-specific hearing, rather than by deleting a table value that has been shown to be necessary to avoid chronic toxicity. Based on these considerations, the Commission believes that the decision not to delete the previously adopted chronic table values for silver also meets the “economic reasonableness” goal set forth in section 25-8-102(5), C.R.S.

Contrary to the assertion of the Silver Council, and in accordance with its established interpretation of this legislative provision, the Commission does not believe that the provisions of section 25-8-202(8)(a), C.R.S. are applicable to the issue of whether to retain previously adopted table values for silver. This provision applies only in the situation where there are “corresponding enforceable federal requirements” in place. There are no federal requirements establishing enforceable silver standards in Colorado. Moreover, even if section 25-8-202(8)(a) were applicable to this proceeding, the Commission finds that the evidence in the record of this hearing includes sound scientific and technical evidence that chronic table values for silver are necessary to protect beneficial aquatic life uses of Colorado waters.

Although the Division of Wildlife presented evidence in this hearing which suggests that more stringent chronic table values than those previously adopted for silver may be necessary to protect aquatic life, the Commission believes that it would be premature to adopt more stringent table values at this time. Testimony presented indicated that there are issues regarding the derivation of the specific equation recommended by DOW that warrant further review before revising the table values. The Commission

encourages the parties to this hearing to work with the Water Quality Control Division and any other interested persons in a collaborative effort to determine whether the existing chronic table values for silver should be modified to more accurately reflect potential toxicity effects. The Commission also encourages future collaborative efforts to further assess the potential economic and environmental costs and benefits of chronic silver table values, including consideration of how such table values may influence effluent limits in discharge permits.

PARTIES TO THE RULEMAKING HEARING

1. Climax Molybdenum Company
2. Silver Council, City of Colorado Springs, City of Fort Collins, & Kodak Colorado Division
3. Colorado Division of Wildlife
4. Chatfield Watershed Authority
5. Lockheed Martin Astronautics
6. Coors Brewing Company
7. US EPA Region VIII
8. Northwest Colorado Council Of Governments
9. City of Westminster

## 31.36 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JANUARY, 1999 RULEMAKING

The provisions of sections 25-8-202; 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE**

This revisions is to reconfirm the previous action taken by the Commission to include correct publication in the Colorado Code of Regulations Statement of Basis, Specific Statutory Authority. and Purpose for the December, 1996 rulemaking hearing.

## 31.37 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JULY, 2000 RULEMAKING HEARING

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-209 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

**Basis and Purpose:**

**I. Climax Molybdenum Company Proposal**

The current Colorado manganese table value was adopted in 1997. It was based on data available at that time that demonstrated the mitigating effect of water hardness on manganese toxicity to a variety of aquatic species, including brook and brown trout. Subsequent to the adoption of the hardness-based table value by the Commission, additional acute and chronic toxicity tests were conducted by the Division of Wildlife (DOW) on rainbow trout. Inclusion of the rainbow trout data results in a more accurate aquatic life manganese table value for Colorado.

The Climax Molybdenum Company (CMC) proposal was developed using EPA's *Guidelines for the Derivation of Ambient Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses.* EPA recommends the use of regression analysis in evaluating concentration-effect relationships for toxicity

data to be used in criteria derivation. In EPA's most recent ambient water quality criteria (1999 revision for ammonia) it recommends the use of a 20 percent effect concentration (EC 20) as the appropriate endpoint for evaluating chronic toxicity. This was the approach originally proposed by CMC. The DOW expressed concern that the result of this methodology would not be protective enough for Colorado. The DOW recommended that a more restrictive 10 percent effect concentration be used. CMC agreed to revise its proposal to accommodate this concern but noted that this may require the consideration of site-specific manganese standards in one case. The Commission adopted the modified proposal.

**II. Farmers Reservoir and Irrigation Company Proposal**

The Farmers Reservoir and Irrigation Company (FRICO) advanced two alternative proposals for consideration in this rulemaking hearing. The first alternative would have added a footnote to section 31.16(1), addressing the relationship of table value criteria to site-specific standards. The second alternative would have added new table value criteria for the agriculture classification for fecal coliform, nitrate and phosphorus. In its prehearing statement, FRICO withdrew the proposal for the adoption of nitrogen and phosphorus standards to protect agricultural canals and reservoirs from eutrophication, in view of EPA's current effort to develop nutrient criteria.

Based upon the evidence submitted in this rulemaking, the Commission has decided not to adopt either proposal advanced by FRICO.

With respect to the proposed footnote for section 31.16(1), the proposed first sentence appears to be a restatement of language in section 31.7 of the regulation, while the second sentence appears to be inconsistent with language in section 31.7. The Commission has determined that the proposed footnote is not necessary or appropriate at this time.

The Commission also has determined that the addition of table values for the agriculture use is not necessary or appropriate at this time, particularly where the function of such table values would be only to protect a limited subclass of that use. The Commission does not believe that the evidence regarding potential impacts on crops from nitrate levels above 5.0 mg/l is strong enough to warrant inclusion of a new table value. Moreover, the existing provisions of the Basic Standards, including section 31.13(3) and section 31.7, provide authority for the Commission to adopt site-specific standards to protect sensitive crops should that be determined necessary and appropriate in particular circumstances.

The Commission also considered the potential risk to agricultural workers of fecal coliform in irrigation water. The Commission has concluded that the evidence available at this time does not indicate that agricultural workers are faced with a risk greater than that associated with a recreation class 2 classification. Since all surface waters are classified either class 1 or class 2 recreation, the Commission has determined that the effect of such classifications serves to protect agricultural workers and that consequently there is no need for a separate fecal coliform table value for the agriculture.

The Commission received conflicting evidence in this rulemaking regarding the potential economic costs and benefits of compliance with water quality standards that might result from the implementation of the proposed new Basic Standards provisions. In view of the lack of an adequate demonstration that the proposed changes are necessary or appropriate to protect agricultural uses, as described above, the Commission has concluded that the benefits of adopting such changes would not bear a reasonable relationship to the potential costs of compliance with resulting requirements.

**III. City of Thornton Proposal**

The City of Thornton proposed that the Commission adopt a new “wastewater treatment plant effluent-dominated” sub-classification under the water supply classification. Thornton also proposed that the Commission adopt numerical table values for fecal coliform, nitrate, phosphorus and total organic carbon (TOC) that would apply to this new sub-classification. Thornton's prehearing statement dropped the proposal for a fecal coliform table value.

Based upon the evidence submitted in this rulemaking, the Commission has decided not to adopt the Thornton proposal.

The Commission does not believe that the evidence submitted demonstrated the need for a separate water supply sub-classification at this time. From the available information, it does not appear that the conditions proposed by Thornton in which the new sub-classification would apply occur frequently enough to warrant the creation of an entire sub-classification and associated table values. Moreover, the existing provisions of the Basic Standards, including section 31.13(3) and section 31.7, provide authority for the Commission to adopt site-specific standards to provide additional protection for specific water supplies, should that be determined necessary and appropriate in particular circumstances.

The Commission also does not believe that the evidence submitted supports the adoption of the table values proposed by Thornton. With respect to nitrate, Thornton provided no convincing evidence that water with nitrate levels between 5 mg/l (Thornton's proposed table value) and 10 mg/l (the existing water supply table value) poses a significant public health risk. Moreover, there was no evidence provided that a population being served by a water source that is “wastewater treatment plant effluent-dominated” is more susceptible to nitrate than the general public. With respect to phosphorus, the table value proposed by Thornton is based on limited site-specific experience and does not warrant the adoption of a statewide table value.

The Commission believes that the potential public health issues associated with TOC should be investigated further. However, the evidence submitted in this hearing does not warrant the adoption of the proposed TOC table value at this time. The evidence does not demonstrate that TOC present in effluent poses a greater risk than TOC from other sources. Moreover, Thornton has not demonstrated that its proposed TOC limit of 2 mg/l above background is necessary to avoid interference with its treatment processes. The potential usefulness of TOC as an indicator for the presence of organic pollutants is worthy of further examination; however, the Commission has concluded that the existing science does not support Thornton's position on this issue.

The Commission received conflicting evidence in this rulemaking regarding the potential economic costs and benefits of compliance with water quality standards that might result from the implementation of the proposed new Basic Standards provisions. In view of the lack of an adequate demonstration that the proposed changes are necessary or appropriate to protect water supply uses, as described above, the Commission has concluded that the benefits of adopting such changes would not bear a reasonable relationship to the potential costs of compliance with resulting requirements.

## IV. Water Quality Control Division Proposals

### A. Overview

This rulemaking hearing addressed a number of potential revisions to this regulation that were identified in a January, 2000 triennial review informational hearing. Many of the revisions proposed for this rulemaking and ultimately adopted by the Commission grew out of the efforts of the Colorado Water Quality Forum's Basic Standards Work Group, which provided important input to the Water Quality Control Division as it developed its proposals for this rulemaking. Each of the major revisions adopted by the Commission is addressed below.

### B. Site-specific Narrative Standard Option (section 31.7(1))

Over the last several years, the Commission has had several discussions regarding how best to use the water quality standards system to encourage improvement - or not discourage such improvement - for waters impacted by historical mining activities. The Commission has felt that neither of the primary options set forth in the Basic Standards - table value standards or ambient quality-based standards - are the best possible fit for many of these situations. To provide additional options, the Commission adopted language in a new subsection (c)(ii) of section 31.7(1). This new subsection explicitly provides that a site-

specific narrative standard may be adopted on a site-specific basis to address waters impacted by historical mining activities where improvement is believed to be attainable. The new provision would include numerical temporary modifications based on existing ambient quality.

This approach could be applied where a use attainability analysis has not yet been conducted, but the Division or other interested parties intend to conduct such an analysis. It would provide that the underlying standards for a segment would be either the results of such an analysis if completed and approved by the Commission, or - if a use attainability analysis is not completed by a specified date - table value standards. This option would provide an incentive for timely completion of a use attainability analysis, while assuring that protective standards will be in place if such an analysis is not completed. An appropriate date will be identified when a narrative standard is adopted for a particular segment, based upon the amount of time needed to complete a site-specific use attainability analysis.

The Commission is aware of the fact that situations may exist where a use attainability analysis for such impacted waters has been completed, and though feasible improvement measures have been identified, uncertainty remains regarding the chemical, biological, and/or physical conditions that will be achieved once those measures have been implemented. Though the Commission considered the adoption of a narrative standard option which would have equated the standard with that concentration or condition realized after the improvement measures were complete, it decided that this concept was adequately addressed within the state's temporary modification provisions, with specific reference to the newly adopted language found in section 31.7(3)(a)(iii). That section addresses situations where significant uncertainty exists. In other words, a temporary modification could be utilized until such time as the results achieved from the implementation of the improvement measures provide a clear indication of the appropriate long-term standard.

The Commission believes that this site-specific narrative standard option should make the water quality standards system more consistent with efforts to remediate state waters degraded by historical mining activities. The new language is specific to waters impacted by historical mining activities because this is the type of situation that has presented a concern regarding the restrictions of the previous options for water quality standards. Other instances where current impaired water quality exists, such as the segments listed on the section 303(d) list, may bring into play a variety of considerations that differ from the unique circumstances associated with waters impacted by historical mining activities that the Commission has determined warrant the new site-specific narrative standard option. If it is determined that other categories of circumstances warrant a similar site-specific narrative standard option, revised or additional provisions can be considered in future reviews of this regulation.

In addition to the language in new subsection 31.7(c)(ii) regarding historical mining sites, the Commission has added language in a new subsection 31.7(c)(i), clarifying the Commission's more general authority to adopt site-specific narrative standards in appropriate circumstances. A variety of site-specific narrative standards have previously been adopted by the Commission where warranted by specific circumstances. It is appropriate for the Basic Standards to recognize this option.

### C. Temporary Modifications (section 31.7(3))

The traditional situation for adopting a temporary modification has been where an underlying numerical water quality standard currently is not being met, but it is believed that the conditions causing the exceedance can be corrected within a 20-year period so that the underlying standard that is protective of the use will be attained. However, over time the Commission has used temporary modifications as a helpful regulatory tool in circumstances that go somewhat beyond this original specific situation. In particular, temporary modifications have been adopted in certain circumstances where there is uncertainty as to whether existing water quality is caused by natural or irreversible conditions, or where there is uncertainty about the level of water quality needed to protect the classified uses of a water segment. In this rulemaking, the Commission adopted revisions to section 31.7(3) to explicitly provide that “significant uncertainty regarding the appropriate long-term underlying standard” is a basis for establishing a temporary modification.

Previous language in section 31.7(3)(b) and section 31.14(3) provided that, whenever a temporary modification has been adopted, discharge permits and other applicable control requirements should include provisions aimed at eliminating the need for the temporary modification. In this rulemaking, the Commission adopted revisions to these provisions to recognize that in instances where a temporary modification is adopted based on uncertainty as to the appropriate underlying standard, it may not be appropriate to expect control actions aimed at achieving the underlying standard until the uncertainty is resolved.

**D. Antidegradation Provisions (section 31.8(3))**

In this rulemaking, the Commission adopted a number of revisions to the Antidegradation Review Process provisions of section 31.8(3). Several changes have been adopted in the “Significance Determination” provisions in subsection 31.8(3)(c). This subsection has provided that an activity will not be considered to result in “significant degradation” if any of four tests are met. If it is determined that an activity would not result in significant degradation, then no further antidegradation review is required. The Commission restructured these significance tests. The test based on 10 percent of the existing load has been revised to apply specifically to bioaccumulative toxic pollutants, since this is the major category of pollutants for which “load”, rather than merely “concentration” , plays a key role. The Commission has selected a bioaccumulation factor (BAF) of 1000 as the threshold above which this test would apply. By placing an “and” at the end of this revised subsection, this loading test is required to be met whenever bioaccumulative toxic pollutants are present in order to determine that a new or increased loading is not significant.

The remaining significance tests would now apply in the case of new or increased loadings of all pollutants. In order to assure that successive new loadings to a segment do not result in an impact that is cumulatively significant without an antidegradation review occurring, the concentration-based “15 percent of the available increment” test has been modified. The revised language provides that where the cumulative impact of discharges would increase the low flow pollutant concentration by more than 15 percent, any new or increased loading would not be considered insignificant based on this test.

The Commission has added language to the regulation specifying that the load and concentration-based significance tests apply to “the portion of the segment impacted by the discharge”. The Commission recognizes a need to further define this term as utilized in the new regulatory language. It has been included, in part, to address concerns over future loading to those segments which currently include in their description “all tributaries thereto”. The Commission directs the Division to work with the regulated community in an effort to further define this concept as a part of the work group process established to develop a new antidegradation guidance document.

The Commission believes that these significance tests warrant additional consideration in the future. In particular, a question has been raised whether the presence of “100 to 1” dilution alone should result in a conclusion that a new or increased loading is not significant, if the concentration-based increment is exceeded. Secondly, additional consideration should be given to whether there are pollutants other than bioaccumulative toxics for which cumulative loads are an important consideration, even when concentration thresholds are not exceeded. The Commission requests that the Division and other interested persons explore these issues further prior to the next triennial review and bring a recommendation back to the Commission at that time as to what, if any, additional revisions to the regulation should be considered to address these concerns.

The Commission also adopted additional language with respect to the “temporary or short term changes” significance test, to assure that this “off-ramp” is not applied where the long-term operation of a regulated activity will result in an adverse change in water quality. Any such impacts should not be considered temporary or short term.

The Commission added a new subsection 31.8(3)(g), entitled “Protection of Existing Uses” . This new subsection merely places in the regulation a provision previously contained in Commission Policy 88-1, providing that a rulemaking hearing will be held to consider adoption of an additional water quality

classification for a water segment if it is determined during an antidegradation review that an existing use of the segment has not been classified. This policy was originally adopted in response to a concern raised by EPA regarding the antidegradation provisions adopted by the Commission in 1988. The Commission determined that it would reduce the confusion that has existed regarding the scope of this policy to incorporate this provision into the regulation, eliminating the need for a separate policy. Therefore, by this action the Commission also is repealing Policy 88-1 as a separate policy document.

The Commission revised the references to “activity” throughout this section to refer to “regulated activity” , for consistency with the terminology used in subsection 31.8(3)(a). In addition, a reference in this subsection to “control regulations existing as of April 30, 1993” was deleted since it appears that this language is no longer necessary.

**E. Statewide Organic Chemical Standards (section 31.11(3) Table)**

An extensive list of statewide numerical standards are established in the table entitled “Basic Standards for Organic Chemicals”, which is contained in section 31.11(3) of the regulation. Two specific issues regarding these standards were addressed in this rulemaking. First, many of the standards are based upon EPA-established drinking water standards, under the federal Safe Drinking Water Act, or water quality criteria developed pursuant to section 304(a) of the federal Clean Water Act. Since these standards and criteria are modified from time to time, it is necessary to review the existing Colorado standards in comparison to the latest available information. As a result of this review, the Commission adopted several revisions to the standards to conform with the latest available information as to protective levels for the various chemicals.

Second, the Commission modified the human health-based criteria set forth in this table to refine how these criteria apply to individual water segments. Specifically, the Commission has established three human health-based standards columns (water supply only, fish consumption only, and water + fish consumption) in the table. The standards in these three columns will apply to individual water segments based on whether (a) a water supply classification, (b) a class 1 aquatic life or class 2 with recurring fishing, or (c) both of these classifications/circumstances is present, respectively. A similar change has been made to Table III. The Commission believes that these revisions result in a system that provides more appropriate human health-based water quality standards for individual circumstances, minimizing the potential for under-protection or over-protection.

In comments submitted for this rulemaking, EPA expressed concern that Colorado's proposed standards for certain “Group C Chemicals” are not adequately protective since they are not based on the potential carcinogenicity of these chemicals. The chemicals in Group C have been identified by EPA as “possible human carcinogens” due to the limited nature of the data regarding carcinogenicity. The Commission's Policy 96-2, regarding Human Health-based Water Quality Criteria and Standards, sets forth a policy approach not to base standards for Group C chemicals on carcinogenicity. The Commission has chosen to continue to apply its established policy approach in this hearing. EPA has recognized that it is the prerogative of states to choose an appropriate level of risk in setting water quality standards. This action by the Commission is a determination that the risks of carcinogenicity of Group C chemicals do not warrant standards based on carcinogenicity at this time. If EPA decides that the evidence of carcinogenicity for the chemicals in question warrants re-classifying them as Group B “probable human carcinogens” , then Colorado's standards will be revised accordingly. Until then, or until the Commission should decide to modify its current standard-setting policy for this category of chemicals, the action taken here is an appropriate state consideration of risk levels in adopting water quality standards.

**F. Recreation Classifications and Standards (section 31.13(1)(a) and Table I)**

In this rulemaking the Commission adopted revisions to the provisions in subsection 31.13(1)(a) regarding recreation use classifications and to the Table I water quality criteria for recreation uses. Several revisions were adopted to the provisions regarding recreation classifications. First, the Commission subdivided the class 1 classification into “class 1a” for waters with existing primary contact uses and “class 1b” for potential primary contact uses. As reflected in the associated numerical criteria in

Table I, the Commission believes that it is appropriate to provide a higher level of protection for those water segments where primary contact uses are actually occurring.

Reflecting the federal requirement that water quality be protected at a level adequate for “recreation in and on the waters” unless it is demonstrated that such uses are not attainable, the revised regulation provides that the Commission shall assign a class 1a or class 1b classification to all surface waters unless a use attainability analysis demonstrates that there is not a reasonable potential for primary contact uses to occur in the waters in question within the next 20-year period. The Commission is requesting that the Division develop a Recreation Use Attainability Analysis Guidance Document that could be used by any person wishing to conduct such a use attainability analysis. This guidance document should be developed with public input, including a public briefing to the Commission that provides an opportunity for public comment to the Division.

The revised regulation also provides that where no use attainability analysis supporting a class 2 classification has been completed, the new class 1a will be the default classification, unless a reasonable level of inquiry has failed to identify any existing class 1 uses of the water segment. Where such an inquiry fails to identify existing recreation uses, a class 1b classification will be appropriate. This approach should help assure that primary contact uses are protected. The Commission intends that what constitutes a “reasonable level of inquiry” will be a case-specific determination, which will depend on factors such as the size and location of the segment in question and what is known about the presence or absence of primary contact uses for other, similar water segments. It generally will be appropriate to direct inquiries to a variety of persons in the area with potential knowledge regarding uses of the water segment, such as to land owners, land management agencies, local governments, recreational user groups, and/or Riverwatch coordinators or other school contacts.

The Commission intends that any revisions of existing recreation classifications and standards to apply the new classifications described above would occur through the normal rulemaking process, which would provide an opportunity for public review of and comment on information supporting any new site-specific classifications and standards. Proposed changes generally are identified in attachments to the rulemaking hearing notice, with any alternative proposals to be considered identified in parties' prehearing statements.

The discussions that led up to this rulemaking hearing included consideration of options that would have included additional subcategories of the recreation use classifications. Although additional subcategories are not being adopted at this time, such options may be considered further in subsequent triennial reviews. The Commission requests that the Division and other interested persons develop additional information regarding the usefulness or appropriateness of such subcategories for consideration in subsequent reviews.

The primary change adopted with respect to the Table I water quality criteria for recreation uses is the addition of Escherichia coli (E. coli) as a pathogen indicator. Available studies indicate that E. coli, which is a subset of fecal coliform, is a better predictor of potential human health impacts from waterborne pathogens. For now, the Commission also has retained fecal coliform table values. The Commission intends that during the next triennium alternative fecal coliform and E. coli numerical standards will be adopted for water segments in the individual basins. The Commission wants the public to be aware that it currently anticipates moving to E. coli as the sole pathogen indicator in the next triennial review of this regulation. Dual standards are being established in the interim as a transitional step. One reason for adopting this transitional approach is that at present there is uncertainty regarding the acceptability and comparability of several alternative E. coli monitoring methods. The Commission is hopeful that much of this uncertainty may be resolved prior to the next triennial review.

As stated in the revised footnote 6 to Table I, so long as dual standards are in place for a water segment, the Commission intends that dischargers will have the option of either parameter being used in establishing effluent limitations in discharge permits. This footnote further clarifies that for the evaluation of ambient water quality data, such as in making section 303(d) listing decisions, in the event of a conflict

between fecal coliform and E. coli data, the E. coli data will govern. The Commission believes that these provisions will help ease the transition from fecal coliform to E. coli standards.

The E. coli criterion adopted for new recreation class 1a is 126 per 100 milliliters. This level is based on EPA criteria recommendations, which are derived from an anticipated risk level of 8 swimmer illnesses per 1000 swimmers. The class 1b criterion of 205 per 100 ml is based on a policy decision to accept a higher risk level - 10 illnesses per 1000 swimmers - for this classification, based on the assumption that primary contact uses are not currently likely to be occurring for these water segments, although such uses may be a potential in the future. The E. coli criterion for class 2 waters is set at 630 per 100 ml, based on an EPA policy recommendation that the criteria for secondary recreation uses not be set higher than five times the primary use standard.

During this transition period, the previous class 2 fecal coliform criterion of 2000 per 100 ml is retained. The previous class 1 fecal coliform criterion of 200 per 100 ml is adopted as the value for the new class 1a. Finally, a fecal coliform level of 325 per 100 ml has been established for the new class 1b, based upon interpolation between the 200 and 2000 values, to be consistent with the new E. coli value for class 1b.

The revised footnote 6 to Table I clarifies that compliance with fecal coliform and/or E. coli standards is to be based upon the geometric mean of representative samples. EPA has recommended that states consider the adoption of single sample maxima for bacteriological indicators, in addition to standards based on geometric means, to provide additional protection of recreation uses. The Commission has declined to adopt such criteria at this time, due in part to uncertainty regarding the significance of and the appropriate response to elevated single sample test results. An important aspect of this concern is the substantial variability that can be common in individual bacteriological samples, because bacteria are not uniformly distributed in water samples, since they behave more like suspended particles, rather than dissolved constituents. Repeat testing on such samples can yield results which vary substantially.

However, the Commission may consider the adoption of single sample maxima or other short-term indicators in the next triennial review. Another approach to short-term indicators that has been suggested would be to provide that no more than “x” percent of samples could exceed a specified level. The Commission requests that the Division and other interested persons develop additional information regarding the usefulness or appropriateness of such short-term bacteriological criteria prior to the next triennial review, including identifying potential criteria values.

The issue of whether and how to account for animal waste in setting recreation standards is a challenging one. Relatively little information is available at present regarding the risks posed by animal sources. Moreover, the range of natural sources - such as waterfowl and terrestrial wildlife - and anthropogenic sources - both urban (pets) and rural (livestock) - present a variety of management challenges with respect to potential options for controlling or mitigating water quality impacts. Therefore, the Commission anticipates that this issue will need to be closely monitored and revisited over the next several years. As a matter of policy, the Commission chose at this time not to include any language in the standard itself - or the accompanying footnote - regarding non-human sources of coliform bacteria.

With respect to non-human sources, the Commission intends that the fecal coliform and E. coli standards will be applied in a manner consistent with EPA's current official guidance, which is contained in the Water Quality Standards Handbook, Second Edition, August, 1994, page 2–3.

In adopting these provisions, the Commission recognizes that the state of knowledge regarding the potential risks posed by non-human sources of coliform bacteria is evolving. The EPA criteria generally were developed based upon evidence of risks posed by human sources. However, there have been recent examples of human health impacts resulting from water contamination by at least some non-human sources, and EPA currently is considering substantial changes to its guidance regarding the use of bacterial water quality criteria for the protection of recreational uses. The Commission believes that the approach adopted here is a reasonable policy choice based on current information. However, the issue of

non-human sources will need to be reevaluated in subsequent triennial reviews as additional information becomes available.

Finally, the Commission wishes to emphasize that ingesting water from streams and other surface waterbodies has inherent risks and is not encouraged, but rather should be avoided to the extent possible during all forms of recreation. While the Commission believes that the criteria adopted here provide a reasonable and appropriate level of protection of human health, avoidance of ingestion is always preferable.

**G. Ammonia Table Values (Table II)**

In December of last year, EPA published its 1999 Update of Ambient Water Quality Criteria for Ammonia. This update is a modification of the 1998 Update of Ambient Water Quality Criteria for Ammonia. Colorado's current table value criteria for ammonia in the Basic Standards were adopted in the late 1980's, following an extensive review of EPA's then-current criteria by a Colorado panel of scientific experts. The recommendations of this panel were set forth in a draft final report entitled Proposed Nitrogenous Water Quality Standards for the State of Colorado, dated March 12, 1986, prepared for the Water Quality Control Commission by the Nitrogen Cycle Committee of the Basic Standards Review Task Force.

In view of the complex set of issues relating to ammonia criteria and standards, and the need to assess the appropriateness of EPA's revised criteria for conditions in Colorado, the Commission decided not to consider changes to the current Colorado ammonia criteria in this rulemaking hearing. Rather, the Commission believes that it will be important for the Division to work with the regulated community and other interested persons to examine the new EPA criteria and develop recommendations for any revisions to the current Colorado criteria and standards that may be appropriate. In order to provide a meaningful opportunity for such an informal process to occur, the Commission anticipates revisiting the ammonia criteria issue in the next triennial review of the Basic Standards and Methodologies for Surface Water.

**H. Standards Based on Secondary Drinking Water Standards (Tables II and III)**

Tables II and III of this regulation include table value criteria for a “water supply” use for four parameters (chloride, sulfate, iron and manganese) that are based on “secondary” drinking water standards developed pursuant to the federal Safe Drinking Water Act. These secondary standards are not health-based, but rather are based upon “welfare” impacts such as taste, odor and discoloration of laundry or fixtures. They are established by EPA as goals for public water supplies and are not required to be enforced by states.

Prior to this rulemaking, the Commission generally applied these four table values as numerical standards for all water segments classified for water supply use, except where site-specific information justified a different standard, e.g. based upon higher naturally occurring levels of the parameter in question. For some time, dischargers have expressed concern about the cost of meeting effluent limitations resulting from the sulfate, iron and manganese secondary drinking water standard-based stream standards, since the secondary standards are not enforceable against water suppliers and are not health-based, and since treatment of wastewater to remove these constituents is generally expensive and difficult. (Similar practical concerns do not seem to have arisen with respect to chloride standards.) On the other hand, although the secondary standards are not enforceable against water suppliers and are not health-based, water suppliers have indicated that due to the needs of their customers it is important to them to minimize these constituents in their source water, and there is a cost to the water suppliers if they need to treat to remove these constituents. Several water suppliers have experienced problems with ambient manganese levels in the past, and have had to add additional treatment steps to remove manganese.

In an effort to balance these considerations, as a result of this rulemaking the Commission is adopting a change to its approach to establishing numerical standards for sulfate, iron and manganese. (No change is being adopted with respect to chloride standards, since it does not appear that there are practical concerns with the current approach to chloride standards.) There are several components to this action:

- Existing numerical standards for all surface water segments that are based on the water supply table values for sulfate, iron and manganese will be deleted in a rulemaking hearing addressing water quality standards for all river basins;

- Existing segment-specific numerical standards for sulfate, iron and manganese that are based on previous site-specific analysis (e.g., identifying higher naturally occurring levels of a constituent) will be retained;

- For segments with a water supply classification that have an actual water supply use (as opposed to a potential use), the Commission is adopting numerical standards based on the less restrictive of (a) existing quality as of January 1, 2000, or (b) the water supply table value criteria for iron, manganese, and sulfate;

- For segments with a water supply classification that do not have an actual water supply use, no numerical standards for sulfate, iron and manganese will be established unless determined to be necessary and appropriate in accordance with section 31.7 as the result of a future site-specific rulemaking;

- For purposes of implementing water supply-based numerical standards for iron, manganese and sulfate into discharge permits, a new provision is added to section 31.14 to direct the Division to give credit in establishing effluent limitations for potentially elevated levels of these constituents in the water entering the wastewater treatment plant or other discharging facility, where the source is ambient surface or ground water tributary to the receiving waters that is no worse than existing quality as of January 1, 2000.

The Commission believes that this set of actions provides the most efficient and reasonable starting point for water supply-based sulfate, iron and manganese standards to provide appropriate protection of actual water supplies against the introduction of new or increased sources of these constituents while also minimizing the risk of costly, unnecessary treatment by point source dischargers. The Commission has essentially “grandfathered” existing levels of these constituents (where they exceed table values) as the numerical standards for segments with an actual water supply use. A proviso has been included to assure that existing contamination levels are not grandfathered if they result from an unauthorized discharge with respect to which the Division has undertaken an enforcement action or if they conflict with remedial action requirements for these constituents established pursuant to any response action under the Comprehensive Environmental Response Compensation and Liability Act. Of course, the numerical standards being established by these revisions to the Basic Standards could be revised to be more or less stringent in a subsequent site-specific standard-setting hearing if determined appropriate based on the site-specific evidence. In some cases, where iron and manganese levels are elevated due to historic mining activities, use of the new site-specific narrative standard option discussed above may be appropriate.

The Commission intends that, consistent with established practice, the “existing quality” of particular segments for the parameters in question will be determined based upon the 85 $^{th}$ percentile of available representative data.

At the same time, the Commission has determined that there is no need for statewide water supply-based sulfate, iron and manganese standards for segments with a water supply classification but no actual water supply use - i.e., those segments classified as water supply based on a potential future use. Where there is no actual use in place that could be impacted by a discharge, the Commission does not believe

that dischargers should need to treat for these secondary drinking water standard-based stream standards. If an actual use for a water supply-classified segment begins in the future, then the numerical standards being adopted as a result of this rulemaking would apply - i.e., existing quality as of January 1, 2000, or table values, whichever is less restrictive. In such circumstances, the Commission expects that the Division would allow a reasonable compliance schedule in issuing or renewing discharge permits.

The Commission has provided that an “actual use” will be determined based on use of the surface waters from the segment in question or use of hydrologically connected ground water. The Commission intends that an actual use of ground water would receive protection where its quality could be impacted by the quality of the surface water in question. Any situation for which it is determined that there is no reasonable potential for the surface water quality to affect the quality of ground water used as water supply should not be considered to involve “hydrologically connected ground water” .

The Commission recognizes that today's action could result in numerical standards for sulfate, iron and manganese applying in a segment with a water supply use classification that has an actual water supply use, but where the only water supply intake(s) are located upstream from any point source discharge(s) to that segment. In these circumstances, if it appears that there are no downstream actual water supply uses potentially impacted by the discharge(s), it would be appropriate for the Commission to re-segment the stream in question so that the numerical standards now being established through the Basic Standards apply only upstream of the water supply intake.

The Commission recognizes that it is not possible to anticipate and account for all potential site-specific factual situations in a statewide rulemaking action such as this. Therefore, the Commission has retained the option of adopting site-specific water supply-based numerical standards for sulfate, iron and manganese that may be more or less stringent than those being adopted here wherever determined appropriate in a site-specific rulemaking proceeding. Moreover, the Commission intends to revisit this action in subsequent triennial reviews of the Basic Standards, to determine whether it is working effectively as intended or may need future refinement. If it is determined that this action results in significantly increased costs for water suppliers, especially in light of significant new Safe Drinking Water Act requirements for additional treatment of public water supplies, the Commission believes that more protective standards should be re-established.

**I. Metals Table Values and Standards Issues (Table III)**

Two sets of changes are adopted with respect to the metals table values set forth in Table III. First, the Commission has adopted language to clarify use of the hardness-based equations in calculating standards, to provide consistency between current practice, this regulation and EPA guidance. The Commission added language to footnote 3 to Table III to explicitly state the limitations on using the hardness-based metals equations in that table. These equations are to be used with hardness values no greater than 400 mg/l, as calcium carbonate, even if the ambient conditions are greater than this range. The data that were used to derive these equations were generally based on toxicity tests in waters with hardness ranging from 50 mg/l to 200 mg/l. The cap at 400 mg/l hardness limits the extent that the equations are extrapolated beyond the original data where the slope of the LC50's flattens out. The previous practice of using a lower limit of 25 mg/l is inappropriate, since there is no evidence that the toxicity does not continue to increase as hardness decreases below 25 mg/l (i.e., the slope remains constant at low hardness).

Adding this clarification in the Basic Standards does not preclude the use of site-specific studies, such as developing a “water effects ratio” to demonstrate that lower toxicity occurs at higher hardness levels in specific circumstances. The Commission is concerned with the current uncertainty regarding toxicity at higher hardness levels that results from available EPA criteria. The Commission encourages EPA to undertake additional studies of the metals in question at higher hardness levels, to reduce this uncertainty and improve the accuracy of the criteria in the future.

Second, the Commission modified the hardness-based table value criteria for several metals to incorporate appropriate “conversion factors” . The need for these conversion factors results from the fact

that the table value criteria originally were developed based on “total recoverable” metals levels, but are now applied as “dissolved” metals standards. Because the dissolved fraction of a metals sample is a subset of total recoverable metals, application of the conversion factors is necessary to assure that metals standards are not under-protective. The revised criteria should more accurately reflect potential toxicity to aquatic life.

Concern was expressed in the hearing regarding application of the revised selenium table values that result from application of the conversion factors. Where selenium data is available only reported to the nearest whole number, the Commission intends that this be taken into account in assessing compliance with the revised table values.

The Commission also added a new Table IV to the regulation, identifying metals levels associated with a range of hardness values, for those metals with table value criteria in the form of hardness-based equations. The Commission has included language in the introductory portion of section 31.16 to clarify that where the hardness-based equations in Table III are applied as “table value” water quality standards for individual water segments, those equations - rather than the values set forth in Table IV - define the applicable numerical standards. The illustrative examples of approximate metals values associated with a range of hardness levels in Table IV are intended solely as an aid to persons using this regulation, for informational purposes only.

**J. Housekeeping Issues**

The Commission corrected a number of clerical errors that had been identified in this regulation.
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3. Centennial Water and Sanitation District
4. Kodak Colorado Division
5. Metro Wastewater Reclamation District
6. The City of Fort Collins
7. The Farmers Reservoir and Irrigation Company
8. The City of Thornton
9. The City of Westminster
10. The Board of Water Works of Pueblo, CO
11. The Chatfield Watershed Authority
12. Plum Creek Wastewater Authority
13. The City of Pueblo
14. Colorado Division of Wildlife
15. The City and County of Denver, Board of Water Commissioners
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17. North Front Range Water Quality Planning Association
18. The Colorado Wastewater Utilities Council
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33. The City of Golden
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44. Viacom International Inc.
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47. The United States Department of Energy, Rocky Flats Field Office
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49. The Town of Lochbuie
50. Denver Regional Council of Governments
51. The City & County of Denver
55. The City of Glendale
56. The City of Boulder
57. Trout Unlimited
58. Bromley Park Metropolitan District 1
59. U.S. Environmental Protection Agency, Region VIII
60. The Board of County Commissioners of the County of Gunnison, CO
61. Arapahoe County Water & Wastewater Authority
62. U.S. Fish & Wildlife Service, Colorado Field Office
63. Battle Mountain Resources, Inc.
64. Colorado Livestock Association

## 31.38 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: OCTOBER, 2000 CONTINUATION OF JULY, 2000 RULEMAKING

The provisions of 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; 25-8-209 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose.

**Basis and Purpose:**

This statement of basis and purpose addresses the revised mixing zone provisions in section 31.10, adopted by the Commission as the result of the October, 2000 continuation of the July, 2000 Basic Standards rulemaking.

Permit limits for point sources of discharge have been determined in Colorado based on the assumption that mixture of the discharge with the receiving water is instantaneous. While this assumption simplifies the preparation of permits, studies conducted by the Division and others have shown that the mixture of a point source discharge with a receiving water occurs over a period of time and therefore occupies a space within which full mixing has not occurred. This space, which is called the “physical mixing zone,” may show concentrations of regulated substances that exceed the acute or chronic water quality standards applicable to the receiving water. The area within a physical mixing zone where a water quality

standard for a given constituent is exceeded is referred to in the regulation as the “exceedence zone” for that constituent. To be fully protective of the designated uses of Waters of the State, the permit limits for point sources of discharge need to take into account not only the numeric standards that apply to the fully mixed condition, but also the appropriate maximum size for exceedence zones.

The Commission recognizes the need to limit the size of exceedence zones associated with point sources of discharge. The allowable size of the exceedence zone for a chronic water quality standard in the vicinity of a particular discharge is referred to as the “chronic regulatory mixing zone” for that particular parameter. The allowable size of the exceedence zone for an acute water quality standard for the same point source of discharge is the “acute regulatory mixing zone.”

The Commission has chosen to treat mixing zones in streams differently from such zones in lakes - the rationale being that mixing in lakes is significantly more complex than mixing in streams- by limiting the use of exclusions to discharges to streams. However, a common approach, allowing the exceedence zone to occupy a limited plan view area of the water body, will be used in both cases.

The sizes of both chronic and acute regulatory mixing zones for streams in Colorado are based on an area that is a function of the “bankfull” stream width, rather than a distance from the discharge. In this way, zones of exceedence for acute and chronic standards in streams are limited to a proportionally small area of the aquatic environment in the vicinity of a discharge. The size of the mixing zone for lakes has been limited to three percent of the surface area of the lake, or a geographically identifiable aspect of the lake, so that, as with streams, the exceedence of water quality standards is limited to a relatively small area of the aquatic environment. Furthermore, the mixing zone regulation limits the cumulative area of exceedence zones resulting from multiple discharges along a reach of stream or in a lake. Finally, the regulation allows for further limitation or denial of a regulatory mixing zone where the use of such a zone, even though small, could create an unacceptable risk of impairment to beneficial uses or damage aquatic habitat of special value.

The Commission has determined antidegradation analyses conducted pursuant to subsection 31.8 are not to be conducted within mixing zones established in a CDPS permit. In addition, for purposes of determining impairment of a waterbody, the Commission will not consider ambient lake or stream data that has been collected within a mixing zone where such mixing zone has been established in a permit using site-specific in-stream measurements. Finally, the Commission has decided not to apply these mixing zone regulations to the determination of whole effluent toxicity (WET) requirements in permits as this issue is appropriately addressed in the Division's WET guidance. The Commission expects the Division to consider the application of mixing zone requirements to the determination of WET permit limits in revisions to the WET guidance that will be made as soon a practicable in conjunction with other necessary revisions to the WET guidance.

The Commission recognizes that adoption of this mixing zone regulation will add complexity to the preparation of permits and to the evaluation of future treatment requirements by dischargers. As a means of minimizing costs and delays associated with this additional complexity, the Commission has included a number of exclusions in the mixing zone regulation that it deems to be consistent with the protection of beneficial uses. As previously mentioned, the exclusions do not apply to discharges to lakes, as the simplifying assumptions that can be applied to mixing of discharges to streams are not relevant to discharges to lakes. Consequently, a mixing zone in the vicinity of a discharge to a lake must be established based on a site-specific mixing zone analysis. Exclusions will be determined based on combinations of physical characteristics of streams (discharge flow rate, stream slope, channel width, etc.) under which the rate of mixing of discharge and receiving stream is so rapid that the application of the mixing zone regulation would be highly unlikely to result in any significant modification of permit limits. For minor discharges, exclusions from the regulatory requirements for mixing zones and avoidance of costs associated with such requirements are allowed where the ratio of effluent discharged to the flow of the receiving water is low as the likelihood of a relatively large exceedence zone is small.

During the rulemaking proceeding, the Commission received testimony upon how the mixing zone provisions could prove problematic for a limited category of man-made water storage facilities utilized as urban recreation and aesthetic amenities and filled primarily with chlorinated potable water. Subsection 31.10(3)(b)(iv) has been added to the rule in order to address this situation and accommodate the needs of the entities that manage these water bodies, on a case-by-case basis, such that they can continue to be filled with potable water and used as they have been historically.

The Commission expects the Division, in cooperation with a stakeholder group, to prepare guidance for the implementation of this regulation. The guidance should include detailed descriptions of procedures that are to be used to collect measurements (e.g. bankfull width) that can be used to determine the applicability of mixing zone requirements to the discharge. The guidance will be noticed for an informational hearing before the Commission. The Commission recognizes that the procedures developed to determine the applicability of exclusions may be somewhat conservative initially. As the Division and dischargers collect more data on mixing zones and the understanding of mixing in streams improves, the Commission expects the guidance to be adjusted where methodologies for determining the applicability of exclusions can be refined.

The Commission also has incorporated directly into the regulation certain assumptions and simplifications, to the extent that these are consistent with protection of beneficial uses. Most importantly, the regulation allows a single value for the size of the physical mixing zone to be used for all low-flow conditions, and directs the Division to include procedures by which this value can be estimated in the aforementioned guidance. Once the size of the physical mixing zone has been determined, it will be used, in the first instance, to determine if the size of the exceedence zone for the relevant chronic standard must be reduced. Where the size of the physical mixing zone is smaller than the chronic regulatory mixing zone, then mixing is implied to be fairly rapid, further analysis of both the chronic and acute mixing zone parameters will not be required, and the full low flow of the receiving stream will be used to calculate water quality standards based permit limits.

While use of exclusions and assumptions reduce the total burden of the mixing zone regulation on the Division and on permittees, some permits will require a full, site-specific, evaluation. A site-specific evaluation may show that a permit will not be affected by the mixing zone regulation, or may show that certain permit limits will be reduced through application of the regulation. The regulation emphasizes the importance of field data for site-specific evaluations. The guidance will allow for the direct use of field data, without the necessity for complex water quality modeling, in site-specific evaluations. Dischargers wishing to use modeling may do so, but models should be calibrated for site-specific conditions from field data. Modelling without calibration with field data will not be considered a sufficient basis for a site-specific evaluation.

The requirements prepared by the Division for site-specific evaluations will be as simple as possible and will not require a high degree of precision, but must constitute a valid estimate of true conditions upon which the adjustment of permits can be based. Although the technical and financial burden of carrying out site-specific evaluations will fall on dischargers, site-specific studies need not be repeated at every permit cycle unless there is a significant change in volume of discharge, a physical change in the receiving water, or evidence of error in the original analysis.

The mixing zone regulation for Colorado acknowledges the existence of incomplete mixing near point sources of discharge and properly limits the extent of any exceedence of standards that might occur within the mixing zone. The regulation is a means by which protection of beneficial uses of water and aquatic habitat in close proximity to point sources of discharge can be achieved without unnecessarily restricting permit limits to maintain standards in a relatively small area of the receiving water in the vicinity of the discharge.

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## 31.39 FINDINGS IN SUPPORT OFADOPTION OF EMERGENCY REVISIONS TO REGULATION NO. 31, THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER (5 CCR 1002-31) AND REGULATION NO. 21, PROCEDURAL RULES (5 CCR 1002-21)

The Commission adopted revisions to Regulation No. 31, *The Basic Standards and Methodologies for Surface Water* , on August 15, 2000.

The Commission submitted the entire regulation to the Secretary of State for republication and to the Office of Legislative Legal Services for review in accordance with section 24-4-103(8)(d), C.R.S. The Legislative Legal Services staff raised a concern that section 31.6(3)(b) of the Basic Standards, concerning “Section 25-8-207 Reviews,” did not incorporate all provisions of section 25-8-207, C.R.S. That statutory section includes water quality designations among the matters subject to review, while the regulation did not. The Commission agrees that Regulation 31 should include appropriate references to water quality designations. In addition, the Commission concludes that conforming changes to the Procedural Rules will be necessary.

If the Commission does not adopt revisions to Regulation 31 and the Procedural Rules on an emergency basis, the General Assembly Committee on Legal Services will need to address this issue. In view of the Commission's conclusion that its regulations should be modified to address this provision of section 25-8-207, C.R.S., the public interest will be best served by a prompt resolution with minimum expenditure of resources. Compliance with the procedures and notice requirements in section 24-4-103, C.R.S., would engender unnecessary delay in achieving conformance of the Commission regulations to Colorado statute. The Commission finds that immediate adoption of these revisions to Regulation 31 and the Procedural Rules is imperatively necessary to comply with state law and that compliance with the requirements of section 24-4-103, C.R.S., would be contrary to the public interest.

## 31.40 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; FEBRUARY, 2001 RULEMAKING

The provisions of 25-8-202, 25-8-203, 25-8-204 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose:

**Basis and Purpose:**

In October, 2000, the Office of Legislative Legal Services identified a deficiency in section 31.6(3)(b) of the Basic Standards and Methodologies for Surface Water, Regulation #31, which addresses “Section 25-8-207 Reviews” . The language in section 31.6(3)(b) at that time did not fully track the provisions of section 25-8-207 of the Colorado Water Quality Control Act. The Commission corrected this deficiency in an emergency rulemaking hearing on November 7, 2000, by adding language including “water quality designations” among the matters subject to review under section 25-8-207, C.R.S. At the same time, the

Commission adopted on an emergency basis corresponding revisions to the corresponding provisions of the Procedural Rules, Regulation #21, regarding section 25-8-207 hearings. The action taken in this rulemaking adopts these same revisions to both sets of regulations on a permanent, non-emergency basis.

## 31.41 FINDINGS IN SUPPORT OF ADOPTION OF EMERGENCY REVISIONS TO REGULATION NO. 31, THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER [5 CCR 1002-31]

The Commission adopted revisions to Regulation No. 31, *The Basic Standards and Methodologies for Surface Water*, on August 15, 2000.

The published version of Regulation No. 31 contains a number of typographical errors. The Water Quality Control Division uses the water quality standards in this regulation to calculate Colorado Discharge Permit System permit effluent limits. Where the Division must use the standards containing typographical errors, the permit limitations would be calculated incorrectly. Depending on the individual circumstances, this could lead to discharge of pollutants that might adversely impact public health. In other circumstances, a discharger might be forced to expend additional funds to meet an effluent limitation based on a published standard that contains typographical errors.

If the Commission does not adopt revisions to Regulation 31 on an emergency basis, discharge permits may be issued incorrectly; that would result in an unnecessary adverse impact on the public. The Commission finds that immediate adoption of these revisions to Regulation 31 is imperatively necessary to preserve public health and welfare and that compliance with the requirements of section 24-4-103, C.R.S., would be contrary to the public interest.

## 31.42 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; SEPTEMBER, 2001 RULEMAKING

The provisions of 25-8-202, 25-8-203, 25-8-204 and 25-8-402 C.R.S. provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with 24-4-103(4), C.R.S., the following statement of basis and purpose:

**Basis and Purpose:**

As the result of a July, 2000 rulemaking hearing, the Commission adopted numerous changes to this regulation. Subsequent to final adoption and publication of those changes, several errors in the revised regulation were identified. These errors, including errors in the equations in Table III, certain calculated standards in Table IV, and several of the entries in the Organic Chemical standards table, were originally corrected in an emergency rulemaking hearing on May 14, 2001. In this rulemaking the Commission has re-adopted these corrections to make the emergency rule changes permanent.

## 31.43 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; SEPTEMBER 2004 RULEMAKING HEARING

The provisions of sections 25-8-202; 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

This hearing was held to consider changes to the Basic Standards for Organic Chemicals found at section 31.11(3). In an effort to keep ground water and surface water standards consistent, the changes to this regulation were considered at the same time as changes to the statewide Ground Water Organic Chemical Standards in Regulation No. 41 (Basic Standards for Ground Water). The Commission

continued to follow past policy decisions and precedence as recorded in Commission policy 96-2, except as regards Group C carcinogens and standards for parameters with MCLs as described below.

**A. Group C Carcinogens**

In November 2000, EPA disapproved the standards for several Group C organic chemicals because the proposed standards were not based on carcinogenic risk. Group C carcinogens are typically classified, based on limited evidence, as possible human carcinogens. Historically, due to the lack of substantive carcinogenic evidence, the Commission has not established carcinogenic-based standards for Group C chemicals, but rather adopted standards based on toxicity.

Based on published human-health risk data there are three classes of Group C compounds, which include:

1) Those compounds with published toxicity (RfD) values,
2) Those compounds with published cancer slope factors (q1*), and
3) Those compounds with published RfD and q1* values.

Previously, the Commission has promulgated standards for the Group C compounds in the first and third class based on toxicity and for the second class based on carcinogenicity. However, this treatment of the class 3 Group C chemicals resulted in EPA disapproving the standards.

As an alternative, the Commission adopted a standard for these Group C chemicals based on toxicity, but with an additional margin of safety to account for any unknown carcinogenic effects. Using this method the standards for Group C compounds, with both RfD and q1* values, are based on toxicological data, and then adjusted downward using an uncertainty factor of 10. The Commission believes that this methodology is consistent with SDWA practices and will be protective of human health.

**B. Update Calculations to Incorporate New Fish Consumption Data**

New information has been published, and adopted by US EPA, that characterizes the per capita fish consumption in the United States. This information relies upon the US Dept of Agriculture's 1994 to 1996 Continuing Survey of Food Intakes by Individuals. The new fish intake rate is 17.5 grams/day. "Fish ingestion" and "water+fish" ingestion standards have been revised to incorporate this new assumption.

**C. Other Updates to Existing Standards**

The existing standards for several organic chemicals were changed. These standards were changed based on either updated human health risk information, or were a Group C compound that the methodology for deriving the standard incorporated the above described uncertainty factor.

**D. Addition or Removal of Compounds**

Five compounds were removed from the table because EPA has removed them from the 304(a) criteria list and there was no independent risk information available. The Commission also added numeric standards for twenty-one additional organic chemicals that are classified as either Group A, known human carcinogens, or Group B, probable human carcinogens where published risk information is available.

One of the new standards that was the subject of extensive written and oral testimony in this hearing is a standard for 1,4-dioxane. Based upon the current status of the scientific evidence as disclosed at the hearing, with specific reference to the number for 1,4-dioxane found in EPA's IRIS database, the Commission adopted a standard of 6.1 ug/l to apply for a period of five years, with a standard of 3.2 µg/l becoming effective at the end of the five-year period. The Commission is aware of the fact that EPA is re-examining its criteria for 1,4-dioxane. However, that effort likely will take a number of years and the result

is uncertain, and there is a current need to address this chemical in the water quality standards context. Because 6.1 ug/l is the value typically used to date for 1,4-dioxane remedial activities in Colorado, the adoption of this value as a water quality standard will provide a basic level of protection of human health while essentially preserving the status quo regarding clean-up requirements for the next five years. This standard provides protection within the same order of magnitude as the 3.2 ug/l standard that results from application of the Commission's generally accepted methodology for establishing health-based standards. The Commission sees no reason in this matter to deviate from its policy regarding the order of magnitude of risk used for the protection of human health.

If no further action is taken by the Commission, the 3.2 ug/l standard will go into effect after five years. If EPA's pending review of 1,4-dioxane results in a revision of the current IRIS value, the Commission can consider a corresponding revision of its water quality standards at that time.

The Commission notes that the adopted standards are consistent with the Department of Public Health and Environment's policy on the use of IRIS in setting standards. The Commission understands that remediation action levels applied by implementing agencies at currently contaminated sites may be set at a different, higher number based on a site-specific risk analysis as referenced in the CDPHE policy. The Commission also notes that it may adopt site-specific standards for 1,4-dioxane if warranted by a site-specific risk assessment. The Commission has adopted numerous site-specific standards for other chemicals where it was determined that such standards appropriately account for site-specific circumstances.

Further, to clarify the use of this standard in a regulatory context, the Commission requests that the Division promptly develop a practical quantitation limit (PQL) for 1,4-dioxane. Consistent with other provisions of this regulation, the PQL will be used as the compliance threshold for implementation of these standards. The Commission notes that it may be appropriate to establish a site-specific PQL for individual discharges, if warranted by the unique characteristics of a particular discharge.

In adopting standards for 1,4-dioxane, the Commission has considered the factors listed in section 25-8-204, C.R.S., as follows:

(a) <u>The need for standards which regulate specified pollutants</u>

1,4-dioxane is a Group B2, probable human carcinogen and has been found as a ground water contaminant in the State of Colorado. In addition, following treatment ground water contaminated with 1,4-dioxane is discharged to Colorado surface waters.

(b) <u>Such information as may be available to the commission as to the degree to which any particular type of pollutant is subject to treatment; the availability, practicality, and technical and economic feasibility of treatment techniques; the impact of treatment requirements upon water quantity; and the extent to which the discharge to be controlled is significant</u>

1,4-dioxane is most commonly treated with a combination of advanced oxidation processes (AOP) in combination with ultraviolet light (UV). This remediation technology, though relatively new, is rapidly becoming a more common technique. The AOP/UV treatment techniques will have minimal impact on water quantity. Evidence was submitted indicating that 1,4-dioxane treatment costs could be substantial in some circumstances, although there was conflicting evidence regarding treatment costs. Because the standard that will be in effect for the next five years is set at the level already most commonly used as a 1,4-dioxane remediation goal, the adopted standard will not have a major impact on treatment costs during this period. The Commission intends that discharge permits issued while the 6.1 ug/l standard is in effect will include effluent limits based on that standard until the expiration of the existing permit. Renewal permits will be subject to the standard in effect at the time of renewal. Moreover, to the extent that the adopted standards do result in increased treatment costs, the Commission believes that such costs must be weighed against the benefits of the protection of public health, including the preventative benefits of reducing the likelihood of future exposure to 1,4-dioxane.

As to the extent to which this pollutant is significant, since 1,4-dioxane is primarily used as a solvent stabilizer, it will most likely be found in areas with known chlorinate solvent contamination. Chlorinated solvents have been in use since the 1960s, with more widespread use occurring in the late 1970s and early 1980s due to the increasing production of electronic circuits.

(c) The continuous, intermittent, or seasonal nature of the pollutant to be controlled

1,4-dioxane is characterized by a high solubility (infinitely soluble/miscible), moderate vapor pressure, and low Henry's Law Constant, all of which indicate that this chemical will be persistent within the aquatic environment. Additionally, the available data indicate that 1,4-dioxane will not readily degrade in the environment.

(d) The existing extent of pollution or the maximum extent of pollution to be tolerated as a goal

The Hazardous Materials and Waste Management Division reports that 1,4-dioxane has been found at 9 sites and is suspected at 19 others. The standards adopted by the Commission establish the maximum extent of 1,4-dioxane to be tolerated as a human health goal, for the reasons set forth in this Statement of Basis and Purpose.

(e) Whether the pollutant arises from natural sources

1,4-dioxane contamination does not arise from natural sources.

(f) Beneficial uses of water

The 1,4-dioxane standards are adopted to protect domestic water supply uses.

(g) Such information as may be available to the Commission regarding the risk associated with the pollutants including its persistence, degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affected organisms, and the nature and extent of the effect of the pollutant on such organisms

1,4-dioxane is a highly persistent contaminant. Very little degradation is observed in the ambient environment. The standards are being adopted to protect human health, so humans are the affected "organisms" . 1,4-Dioxane is classified by EPA as a probable human carcinogen (Group B2). Conflicting evidence was submitted regarding the level at which 1,4 dioxane poses a human health risk. Some parties argued that a different toxicity model than that used to develop the current IRIS value for 1,4-dioxane should be used to characterize its toxicity. Some parties also argued that a 1,4-dioxane standard should be established based on a PQL for this chemical, but the Commission believes that the standard should be health-based. The Commission acknowledges that there are conflicting scientific interpretations of the available information and that further review and analysis of the toxicity of 1,4-dioxane is warranted. However, the outcome of that further review is uncertain and the Commission does not believe that there is sufficient evidence to invalidate the current EPA IRIS value at this time. The Commission believes that the record supports the scientific and technical validity of the standards that it is adopting. Moreover, in the face of conflicting scientific information, as a matter of policy the Commission has decided to err in the direction of protection of public health in approving the 6.1 ug/l and 3.2 ug/l standards for 1,4 dioxane.

## E. Hybrid MCLG/MCL Standards

Since the 1989 hearing, there has been debate about whether standards for parameters with MCLs should be based on the MCLs or purely health-based numbers. The arguments for MCLs focused on whether it is reasonable to require in-stream standards (and potentially wastewater treatment) to a level cleaner than allowed for drinking water. The arguments for health-based standards focused on

maximizing human health protection, putting the clean-up burden on pollution sources, and the fact that wherever dilution is available end-of-pipe effluent limits would be less restrictive than the standard.

In this hearing, the Commission adopted a hybrid MCLG/MCL proposal that provides much of the benefits advocated for each of the above options. The adoption of this proposal assures that the in-stream water quality goal will be as close to purely health-based numbers as feasible, while assuring that no discharger will be required to meet effluent limits for these parameters that are more stringent than MCLs. Additionally, the hybrid MCLG/MCL proposal was concurrently considered for Regulation 41, The Basic Standards for Ground Water, and the adoption of this rule for ground water provides a consistent approach to addressing water quality for all waters of the State.

PARTIES TO THE RULEMAKING HEARING

1. Schlage Lock Company
2. Teck Cominco Limited
3. Raytheon Aircraft Company
4. City and County of Denver
5. Waste Management of Colorado
6. Lockheed Martin Space Systems Company
7. Barrick Gold Corporation
8. Shell Oil Company
9 . Colorado Wastewater Utility Council
10. The City of Boulder
11. Emerson Electric Company
12. Colorado Association of Commerce and Industry
13. Metro Wastewater Reclamation District
14. Dover Industries, Inc.
15. Colorado Mining Association
16. The Board of County Commissioners of El Paso County
17. The JRW Family Limited Partnership
18. The South Adams County Water and Sanitation District
19. Colorado Department of Transportation
20. U.S. Environmental Protection Agency
21. Stephen A. Bain
22. U.S. Department of Energy, Rocky Flats Project Office
23. John D. Fognani & Suzanna K. Moran
24. Alliant Techsystems Inc.

## 31.44 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; June 2005 Rulemaking Hearing; Final Action August 8, 2005; Revisions Effective December 31, 2005 and December 31, 2007

The provisions of sections 25-8-202; 25-8-203; 23-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

### I. Water Quality Control Division Proposals

### A. Overview

This rulemaking hearing addressed a number of potential revisions to this regulation that were identified in the November 2004 issues formulation hearing. Many of the revisions proposed for this rulemaking and ultimately adopted by the Commission grew out of the efforts of the Colorado Water Quality Forum's Basic Standards Work Group, which provided important input to the Water Quality Control Division as it

developed its proposals for this rulemaking. Each of the major revisions adopted by the Commission is addressed below.

**B. Definitions (section 31.5)**

The Commission added definitions for *E.coli*, effluent-dependent stream, effluent-dominated stream, ephemeral stream, existing quality and primary contact recreation. These definitions are discussed more below.

The Commission has revised section 31.5 by adding a subsection (18), which defines "ephemeral streams." Ephemeral streams are characterized by surface water and groundwater hydrology. To determine whether a stream is ephemeral, visual observation or a rain gage should be used to determine whether water is present for only a short duration following precipitation or snowmelt. If water is present for more than just a short duration, then the depth of the groundwater should be monitored. If the groundwater and flow are not connected, then the system is ephemeral.

**C. Ambient Quality Based Standards (section 31.7(1)(b))**

There has been confusion regarding how acute standards are to be set where natural or man-induced conditions justify ambient standards. This section was clarified to state that acute site-specific ambient quality-based standards should be set at a level equal to the 95 th percentile of the available representative data. This approach avoids debate over "outliers" yet characterizes the high levels that have been recorded.

**D. Temporary Modifications (sections 31.7(3), 31.7(4) and 31.14))**

The Commission revised sections 31.7(3) and (4) that address the conditions for granting a temporary modification, the duration of temporary modifications and the procedures for granting, removing or extending temporary modifications. The Commission also revised section 31.14 that addresses implementation of temporary modifications in discharge permits.

1. <u>Remove the distinction between types of temporary modifications</u> : The Commission deleted the second half of subsection 31.7(3)(b) so that, regardless of the conditions upon which the temporary modification is based, the impact of the temporary modification upon regulated entities is the same. The Commission felt that all three conditions in subsection 31.7(3)(a) should warrant the same focused attention. In cases where the sources of pollution are correctable, it is important to determine the level of water quality that can be achieved so that appropriate control actions can be undertaken, whether for point or non-point sources.

It is anticipated that this approach to temporary modifications will ensure that a more thorough consideration is given to the causes and sources of non-attainment before temporary modifications are proposed. In many cases, the appropriate way to address non-attainment of underlying standards will be through the TMDL program, not through adoption of temporary modifications. This may be particularly true where there are no point-source discharges.

Where the Commission determines that the TMDL program is the vehicle to address "the need for additional information regarding the extent to which existing quality is the result of natural or irreversible human-induced conditions or regarding the level of water quality necessary to protect current and/or future uses" , no temporary modification shall be assigned. Non-attainment of underlying standards shall be addressed through Listing and prioritization of TMDLs.

In cases where there are point source discharges on such segments, decisions on temporary modifications will be made on a case-by-case basis and may include consideration of the parameter of concern, whether that parameter is present in the discharge, what are the other sources of the parameter,

and what are the plans to either return the water to full attainment or determine what are the appropriate underlying standards.

2. Clarifying the duration of temporary modifications: The Commission modified subsection 31.7(3)(c) and removed the explicit statement that permitting status was to be taken into account when determining the duration of the temporary modification. Current language makes it clear that the intent is to attain the underlying standard as soon as possible. The duration of temporary modifications would also be decided based upon the complexity of the issues to be resolved, the data that needs to be collected, and other site-specific considerations. The duration of temporary modifications should be limited to the amount of time reasonably necessary to resolve the uncertainty as to what action is necessary to achieve attainment (if the basis is (i)) or what the appropriate underlying standard should be (if the basis is (iii)). Compliance time would generally not be considered in establishing the duration of temporary modifications because compliance schedules would be prepared upon the resolution of the underlying standard and re-opening of the permits to reflect the resolution. An exception could be made based on a situation where, due to the requirement that compliance schedules may not extend past the duration of the permit. In these cases, the permittee would not have a reasonable amount of time in the period between the expiration of the temporary modification and the projected expiration date of the next issued permit to meet new limits based on the underlying standard.

3. Instituting annual review of temporary modifications (section 31.7(4)) : The Commission restructured section 31.7(4) and has established an annual rulemaking hearing to review temporary modifications (regardless of the basis) that are due to expire in the two years following the rulemaking hearing. The Commission will consider evidence as discussed in subsections 31.7(3) (b) and (c) to determine whether the temporary modification should be modified, eliminated or extended.

4. Implementation of Temporary Modifications in Discharge Permits (subsection 31.14) : The Commission revised subsection 31.14(3) and added subsections 31.14(15) and (16) to more clearly define the relationship between temporary modifications and CDPS permit limits. The second sentence of subsection 31.14(3) was struck and the detail provided in subsections (15) and (16).

The Commission has clarified its intent for the use of temporary modifications, including their duration. In establishing the duration of a temporary modification, the Commission will be focusing on the length of time required to determine the appropriate underlying standard.

Given this priority, the Commission adopted new subsection 31.14(15)(a). The Commission has provided latitude in this section for the Division to consider circumstances under which the permittee may not be able to comply with limits based on the underlying standard during the term of the permit (e.g. where a renewal permit would expire shortly after the underlying standard takes effect).

The Commission adopted subsection 31.14(15)(b) to allow permittees, discharging to segments where temporary modifications have been adopted pursuant to subsection 31.7(3)(a)(iii), to focus their available resources on addressing uncertainty with respect to appropriate water quality standards. The Commission finds this to be appropriate and has determined that schedules of compliance directing permittees to identify and implement facility improvements are not required until the appropriate underlying standard is adopted. That way, permittees will be able to develop proposals for meeting underlying standards knowing the underlying standard that will have to be attained. In order to ensure that the underlying standard is attained in a timely manner, the Commission is requiring that the Division reopen permits within a reasonable period after its adoption. In this regard, permits should normally be reopened within six to nine months of the adoption of the underlying standard. However, the Commission intends that the Division have flexibility in its interpretation of this provision so that situations, such as where a permit will expire in twelve months, can be taken into account.

Also, consistent with the Commissions expectation that progress be made to develop information to resolve temporary modifications, it added subsection 31.14(15)(b)(ii). This subsection provides explicit authority for the Division to require permit compliance schedules that include milestones and dates to ensure that information necessary to determine appropriate underlying standards is developed.

The Commission adopted subsection 31.14(16) in order to provide direction that, while temporary modifications are in place, water quality should be maintained at the best level that is practicably achievable. This provision allows the Division to exercise its discretion in determining the level of treatment that a facility can provide without significantly increasing costs such that water quality would be maintained or even improved. An example would be where the existing quality of the facility discharge is better than the level of the temporary modification or where relatively minor actions, such as adopting local pretreatment limits or low cost facility improvements, could be taken to improve the quality of the discharge.

Concern was expressed in the hearing that this provision could have a ratcheting down effect on permit effluent limits. In other words, there was concern that a reissued permit could be based on the actual performance of a discharger that has achieved effluent quality better than required by its permit limits. If effluent limits were tightened to reflect this better effluent quality, the discharger could then be required to improve its discharge quality even further in order to consistently stay in compliance with the new limitations. This is not the Commission's intent. Rather, the Commission intends that best professional judgment-based effluent limits would be set at a level intended to maintain existing effluent quality, not at a level to further improve effluent quality.

For new or expanding facilities, the Commission is requiring the Division to establish limits that will be protective of downstream uses. The Commission does not expect the Division or other party to conduct a use attainability-like analysis in these situations. However, a sensitivity analysis or other appropriate approach should be used to establish the magnitude of downstream pollutant concentrations to evaluate potential impacts to uses. The Commission recognizes that, in some situations, allowing an increase in loading to the stream may be appropriate or even beneficial.

The Commission recognizes that portions of the temporary modification provisions adopted in this rulemaking may be inconsistent with current provisions in Regulation No. 93. The Commission intends that the provisions adopted in this rulemaking will govern and that appropriate revisions will be adopted in Regulation No. 93 in the next rulemaking hearing reviewing that regulation.

**E. Antidegradation Provisions (section 31.8)**

1. Use Protected Designation (section 31.8(2)(b)) . The purpose of these provisions is to identify waters whose quality is not better than the federal "fishable, swimmable" goal, and which therefore are appropriately not subject to the antidegradation review process. The regulatory provisions in effect since 1988 establish several alternative criteria for applying a use-protected designation to specific water segments. Based on experience since that time, the Commission determined that revisions to some of these criteria are appropriate.

One previously automatic basis for a use-protected designation was the existence of a class 2 aquatic life classification for the water segment. The record demonstrates that in fact there are segments with a class 2 aquatic life classification that have water quality better than the aquatic life and recreation use table value criteria. The revisions adopted eliminate the presence of a cold-water aquatic life classification as a basis for a use-protected designation. The Commission determined that there is no substantial evidence of a correlation between cold water class 2 aquatic life classifications and poor water quality.

For warm water class 2 streams, the Commission modified the provision regarding application of a use-protected designation. The presence of a warm water class 2 classification will still be a presumptive basis for applying a use-protected designation; however, that presumption can be overcome based on the provisions of new subsection 31.8(2)(b)(iii) if the water quality test in that subsection is met. That is, if there is data showing better-than-table-value water quality for at least 10 of 12 indicator water quality

parameters and the segment is not listed, and does not qualify for listing, for two or more pollutants for exceedance of chronic or 30-day standards, the aquatic life class 2 classification will not be a basis for a use-protected designation.

The Commission also revised the provisions of subsection 31.8(2)(b)(i)(C). This subsection provided that a segment would not be designated use-protected if its quality was maintained better than standards solely because a point source discharger was achieving treatment levels better than required by law. This provision was never utilized to apply a use-protected designation and discussions with interested parties indicated confusion regarding how the previous language was intended to be interpreted. The Commission revised this subsection to provide that “effluent-dependent” and “effluent-dominated” water segments generally will be designated use-protected. Because such waters are, by definition, those where the majority of the flow consists of treated wastewater for the majority of the time, the Commission has determined as a matter of policy that it is reasonable to assume that in most instances such waters will not maintain water quality significantly better than table value standards for the majority of pollutants. Of course, the quality of these waters will continue to be protected for their designated uses. The Commission added definitions of the flow regimes “effluent dependent stream” , “effluent dominated stream”, and “ephemeral stream” in section 31.5.

The Commission anticipates that the revised 31.8(2)(b)(i)(C) generally will result in use protected designations for most effluent dominated and effluent dependent water bodies. Parties advocating that a segment should be use-protected because it is effluent dependent or effluent dominated will need to provide flow data that documents that one of these definitions is met. However, the Commission cannot conclude, based on the limited evidence presented in this rulemaking, that use protected designations are necessarily appropriate for all effluent-dependent and effluent-dominated waters. Instead, the Commission has determined that it is appropriate to allow flexibility to make decisions for effluent dependent and effluent dominated waters based on the water body's public resource value and ecological significance. The Commission expects to apply this provision considering factors such as representative existing water quality data, information regarding the effects of nonpoint sources on water quality, the extent to which existing point source loads are less than allowed under current discharge permits, existing uses of the water by the public, the location of the water body, and ecological attributes. The purpose of allowing this flexibility is to recognize that: (1) numeric standards have been established for a large number of parameters, (2) in all effluent dependent and effluent dominated waters, assimilative capacity exists for some of those parameters, and (3) maintenance and protection of that assimilative capacity may be appropriate and desirable.

Finally, the Commission revised subsection 31.8(2)(b)(ii). This subsection was created to provide for the possibility of a use-protected designation where a segment may have poor water quality for parameters other than those considered in the 12-parameter test in subsection 31.8(2)(b)(i)(B). The Commission has revised this provision to clarify that if there is poor water quality for one or more of those 12 parameters <u>in addition to</u> poor water quality for other parameters, the cumulative water quality conditions can be considered in determining whether to apply a use-protected designation. The Commission also notes that a portion of the existing language in subsection 31.8(2)(b)(ii), which is not being changed in this rulemaking, provides that “substantial natural or irreversible human-induced pollution” may be a basis for a Commission determination that a use-protected designation is appropriate. The term “pollution” is defined in the Colorado Water Quality Control Act more broadly than the term “pollutant” and can include any “alteration of the physical, chemical, biological, and radiological integrity of water” . Therefore, the Commission intends this provision to allow non-chemical water quality conditions to be taken into account in a site-specific determination that the quality of particular waters does not “exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water” and therefore does not warrant the extra protection provided by the antidegradation review process.

The Commission considered alternative proposals for revisions to the use-protected provisions submitted by the Littleton-Englewood Wastewater Treatment Plant. In view of uncertainties regarding application of the revisions proposed by Littleton-Englewood, and because the Commission believes that the provisions adopted provide appropriate flexibility in applying use-protected designations, the Commission declined to adopt the Littleton-Englewood proposals.

2. Regarding Adjusting the Baseline Where Water Quality is Improving (section 31.8(3)(ii)(B)) : The September 30, 2000 date for determining baseline water quality was established as the result of a July 2000 rulemaking hearing. In that hearing, the primary assumption was that increasing human development over time would result in increasing water quality impacts and that the September 30, 2000 date would establish the minimum water quality used as a baseline against which to gauge future impacts. In establishing that date for determining baseline water quality, the Commission did not consider the possibility that water quality might improve after September 30, 2000.

There is currently substantial interest in remediation efforts to reduce the water quality impacts from past contaminant releases in Colorado, e.g. from past mining operations. Where remediation is legally mandated and such efforts are successful, the Commission believes that it is appropriate to help assure continuing benefits from the completed remediation by using the resulting improved water quality as the baseline for future antidegradation reviews. Otherwise, the opportunity for any new discharger to fully consume any increased assimilative capacity resulting from remediation activities could effectively undermine the benefits of clean-up efforts. Note that by referring to “unpermitted” past contaminant releases the Commission intends that the term “remediation” in this provision not apply to improved treatment of ongoing, permitted releases, e.g. from a municipal wastewater treatment plant.

The Commission also recognizes that some remediation, including that associated with pollutant trading, is not legally mandated. This brings additional considerations into play. In such circumstances, the Commission intends that in determining whether to establish an alternative baseline to be used for antidegradation purposes, it will consider the site-specific circumstances, including but not limited to (1) the benefit of protecting improved water quality that results from remediation and (2) the benefit of encouraging voluntary clean-up efforts. In no event would the alternative baseline be water quality worse than that as of September 30, 2000. The Commission recognizes that in some circumstances it may be appropriate to use the water quality resulting from voluntary remediation as the new baseline, to help assure that the actions of one entity do not undo, without adequate review, the benefits of remediation performed by another entity. However, in other circumstances, entities could be discouraged from conducting voluntary remediation if the improved water quality could result in stricter requirements on future modifications to their own discharge. Any individual or entity, including those involved in the remediation efforts, may petition the Commission, at any time, to establish an alternative baseline, including prior to proceeding with a remediation project. Nothing in this rule revision is intended to in any manner interfere with or adversely affect either existing or future water pollutant trades that are consummated in a manner consistent with state policies or regulations regarding trades, including the use of pollutant credits or offsets generated.

When the Division becomes aware of waterbodies where remediation of impacts from past unpermitted releases has or will result in improved water quality after the September 30, 2000 baseline date, the Division will provide documentation of this in the Basin Rationale at the time of the next basinwide or site-specific rulemaking hearing encompassing the segment. In such circumstances, the Commission will also include a note in the Designation column in the basin tables to indicate that the September 30, 2000 default baseline date does not apply to the specific segment. For such waterbodies, the appropriate baseline date will be determined at the time that a new activity triggers an antidegradation review. It is anticipated that in most cases this will be the date upon which the antidegradation review commences. However, where the remediation is not yet complete or the water quality benefits of remediation have not yet been fully realized in-stream, verifiable evidence of future pollutant loading reductions may be utilized to establish a baseline date that extends into the future.

**F. Statewide Standards (section 31.11):**

A footnote was added to the statewide radionuclide Standards that clarifies which parameters should be analyzed in the unfiltered fraction.

Aquatic-life based criteria for Tributyltin (TBT) were added to the Basic Standards for Organic Chemicals Table based on information from EPA's National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

**G. Recreation Classification (section 31.13) and Table Values (section 31.16 Table I)**

In this rulemaking the Commission adopted revisions to the provisions in subsection 31.13(1)(a) regarding recreation use classifications, and to section 31.16 Table I water quality criteria for recreation uses.

The revised regulation moves the definition of primary contact recreation to the definition section at 31.5 and establishes two subsets of primary contact recreation and one undetermined recreational use category and a "Not Primary Contact" use category.

> **Existing Primary Contact Use** : The Commission intends that this classification receive the highest level of protection (with an anticipated risk level of 8 swimmer illnesses per 1000 swimmers). It is to be adopted where evidence has been presented that these waters are used for primary contact recreation or have been used for such activities since November 28, 1975 (per the Federal Regulatory definition of "existing uses"). This use category applies to a subset of waters previously classified recreation 1a.
>
> **Potential Primary Contact Use:** The Commission intends that this classification be used where a reasonable level of inquiry has failed to identify any existing primary contact use, but a full scale Use Attainability Analysis has not been conducted, or such analysis shows that primary contact uses may potentially occur in the future. This classification will receive a slightly elevated numeric value (with an anticipated risk level of 10 swimmer illnesses per 1000 swimmers). This use category replaces the previous recreation class 1b.
>
> **Undetermined Use:** The Commission intends that this classification be used where little or no effort has been undertaken to determine the level of recreational use of a waterbody. This classification will receive the highest level of protection (with an anticipated risk level of 8 swimmer illnesses per 1000 swimmers) and will be the default classification until the Commission has determined that another classification is appropriate.
>
> **Not Primary Contact Use:** The Commission intends that this classification be used only where a Use Attainability Analysis has been conducted that demonstrates that there is not a reasonable likelihood that primary contact uses will occur in the waterbody within the next 20 years. This classification will receive the lowest level of protection (five times the existing primary contact use standard). This use category replaces the previous recreation class 2.

This revised classification system for recreation uses was established to address issues of documentation and inquiry, or lack thereof. A key aspect of this revised classification system is to distinguish different reasons for applying the highest level of bacteriological standards protection to water bodies. The previous "class 1a" designation was applied either because an existing primary contact use had been documented for a segment or as a protective default classification where no significant site-specific investigation of recreation uses had occurred. These different situations are clearly distinguished by the new set of classifications. In addition, the "undetermined use" category provides a useful option in those circumstances where there is good water quality and no objection to applying the more stringent standards, but there is concern about labeling state waters on private lands as "primary contact" recreation waters when landowners intend not to provide public assess to those waters.

These new recreation sub classes necessitated revisions throughout Regulation No. 31 to ensure that references to recreation classifications conformed to the new nomenclature.

The Commission revised the first sentence of subsection 31.7(1)(b)(iii) to delete the words “acute or chronic” . The reason for this change is to assure that site-specific standards can be adopted for classified uses other than aquatic life. For example, site-specific standards may be appropriate for a segment with a Class E recreation classification where it is demonstrated that *E.coli* levels in excess of table values are present as the result of natural or irreversible human-induced sources.

The Commission intends that any revisions of existing recreation classifications and standards to apply the new classifications described above would occur through the normal rulemaking process. This would provide an opportunity for public review and comment on information supporting any new site-specific classifications and standards.

Although Colorado has historically used a fecal coliform standard, *E. coli* levels have been shown to be a better indicator organism of the risk of human illness. *E. Coli* standards were added to the Basic Standards in 2000 and the Commission proposes to complete the transition to *E. coli* by removing the fecal coliform table values. The Commission intends to implement this change by deleting fecal coliform standards from individual segment standards in the next round of basin reviews.

The Commission also added the definition of “*E.coli*” to section 31.5.

**H. Temperature Table Values (section 31.16 Table I)**

Having considered the evidence submitted in this rulemaking the Commission believes that it is appropriate to move forward toward revised temperature table values. However, since this is a very complex issue and there is still much controversy, the Commission adopted revised temperature criteria with an effective date of December 31, 2007. The intention of the Commission is to retain the current standards until that date. During the interim, the Commission encourages establishment of an expert panel to review the available data and provide input on technical and policy issues regarding appropriate temperature standards for Colorado. The Commission anticipates that a further rulemaking hearing will be held prior to December 31, 2007, to consider further revisions to the temperature table values.

The Commission recognizes that many participants in this rulemaking hearing are likely to disagree with various specific aspects of the temperature criteria now being adopted with a delayed effective date. The Commission acknowledges this disagreement and intends that the overall package of criteria now adopted help create an incentive for further analysis of appropriate temperature criteria.

The Commission also recognizes that, because proposals evolved throughout this rulemaking process, for several specific aspects of the criteria now being adopted there is limited information in the hearing record beyond the statements contained in the original proposed statement of basis and purpose. In particular, because the Division’s proposal evolved, several aspects of the original proposal did not receive a full dialogue from all interested parties. Nonetheless, the Commission concluded that the reasoning expressed in the original proposed statement of basis and purpose provides the best explanation regarding the rationale for the specific criteria adopted in this rulemaking.

The Commission adopted revised temperature standards, as proposed by the Division in February 2005, in Table 1 and Section 31.14(14). This proposal was developed based on a literature review of temperature effect data for fish species present in Colorado. The temperature standards adopted provide protection for the aquatic community from lethal and sublethal effects, and provide protection against abrupt changes in water temperatures that may lead to thermal shock.

The original Colorado temperature standards were first adopted by the Commission in 1978. Over the years, the basis for the original standards has become unclear, the standards have been inconsistently applied in permits, and there have been disagreements about how the attainment of these standards should be assessed.

In this rulemaking, the Commission adopted new temperature standards based on warm and cold-water use classifications and adopted two new qualifiers of cold water use classifications, “cutthroat trout” and “cool water”. These new qualifiers were developed in recognition that the cold water classification covers a wide range of temperature regimes and aquatic life communities.

The cutthroat trout (“ct”) qualifier was developed to provide protection for cutthroat trout, a Colorado threatened species. Cutthroat trout require somewhat lower temperatures than other trout species. The Commission intends that the “ct” qualifier will be adopted on a site-specific basis where evidence has been presented that cutthroat trout are present or are expected to be present in a water body.

The cool water (“cw”) qualifier was developed to acknowledge that temperature regimes are a continuum and the transition between cold and warm is not abrupt. The Commission intends that the “cw” qualifier will be adopted on a site-specific basis where the downstream end of the segment adjoins a warm water segment and where there is either free passage for cold water fish to move upstream or adequate refugia within the segment. These decisions will be made on a case-by case basis and are not intended to prejudge or predetermine the work of the Aquatic Life work group that is working on refined aquatic life classifications.

Two types of criteria were adopted: Maximum Weekly Average Temperature (“MWAT”) and Daily Maximum (“DM”). The MWAT provides protection against sublethal effects on metabolism, growth, and reproduction. The MWAT is defined as the mean of multiple, equally spaced, daily temperatures over a 7-day consecutive period. The DM provides protection against lethal effects that elevated temperature can cause. The DM the maximum temperature attained in any one day. The MWAT is calculated from the optimum and upper temperatures tolerated by a species:

$$MWAT = \begin{pmatrix} upper\ optimum \\ temperature \end{pmatrix} + 1/3 \left( \begin{bmatrix} ultimate\ upper\ incipient \\ lethal\ temperature \end{bmatrix} - \begin{bmatrix} upper\ optimum \\ temperature \end{bmatrix} \right)$$

The rationale for using the MWAT as a temperature standard is based on studies that show moderate temperature fluctuations can be tolerated as long as the upper incipient lethal temperature is not exceeded for extended periods of time. The basic assumption of this method is that optimum temperatures are not necessary or realistically attainable at all times to maintain healthy fish populations.

The temperature criteria (both MWAT and DM) were developed for warm, cold and cool temperature regimes based on review of the temperature toxicity data in the literature. Where multiple studies were conducted for each species, the average for each value above was calculated before entering them into the MWAT equation (e.g., an average upper optimum temperature was calculated from multiple studies). Species MWATs were ranked and the value was selected that protects 95 percent of the species. The DM was developed by calculating an average ultimate incipient lethal temperature for each species, ranking the species and selecting the value that protected 95 percent of the species.

The Commission determined that special consideration should be provided for cold water fish during spawning seasons when they are more sensitive to increased temperature. The temperatures during these periods must be protective of the offspring (eggs, and early life stages). The spawning criteria are to be applied on a seasonal basis in segments where habitat is suitable and spawning is expected to occur. This standard is to be implemented as the MWAT in CDPS permits just as the DO spawning is applied.

Due to the complexity of a temperature standard and the potential for natural systems to have temperatures exceeding the numeric standards, the Commission adopted a series of excursions. The following excursions will not be considered an exceedance of the temperature standards:

> Air temperature excursion : ambient water temperature may exceed the criteria in Table 1 or the applicable site-specific standard when the daily maximum air temperature exceeds the 90 th

percentile value of the annual maximum air temperatures calculated using at least 10 years of air temperature data.

Low-flow excursion : ambient water temperature may exceed the criteria in Table 1 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 : When a lake or reservoir is stratified, the surface layer may exceed the Table 1 value as long as the lower levels meet the temperature and dissolved oxygen standards.

Natural hot springs: ambient water temperature in a water body may exceed the criteria in Table 1 or the applicable site-specific standard, when the temperature in that water body is influenced by a natural hot springs.

The Commission acknowledges that there may be a need to adopt site-specific temperature standards that differ from current temperature standards to provide adequate protection for specific segments during the interim period prior to the delayed effective date of the revisions approved today.

**Thermal Shock** : Thermal shock has lethal and sublethal effects that result from an abrupt change in stream temperatures. The Commission adopted the provision in 31.14 (14) that effluent shall not cause an abrupt change in temperature of a magnitude, rate and duration deemed deleterious to the resident aquatic life This is quantified as no more than a 1°C change over one hour not to exceed 12°C in 24 hours. Because the effects of thermal shock are dependent on many factors (acclimation and thermal history, fish body size, other stressors) a single thermal shock criteria is a simplification. However, the Commission believes that it is important to protect fish from anthropogenic thermal shock.

The rate of change of 1°C per hour was selected since experimental evidence suggests that most fish can tolerate temperature shifts of 15 to 18°C if exposure falls within the tolerance range of individual species. Further, daily temperature fluctuations (within 10 to 12 hours) in this range have been measured in small streams of low volume without apparent high mortality. This equates to 1.25 to 1.8°C per hour.

Other parties have suggested a rate of change based on the research approach called Critical Thermal Method (CTM) wherein fish are warmed at a constant rate to either a lethal temperature or a loss of equilibrium. The key in this approach is to select a rate of change that is rapid enough that fish do not acclimate while they are being tested but slow enough that the internal temperature does not lag significantly behind the water temperature. Many rates have been recommended for CTM experiments ranging from 18°C per hour (in studies by Beitinger and by Becker and Galaway) to 1.2°C per hour (in studies by Elliot and Elliot). The Commission decided that the upper range was inappropriate since at 15°C, heat shock proteins have been shown to form in the tissues of rainbow trout. A rate rounded to 1°C per hour was selected.

**Natural Conditions:** In adopting new numeric temperature criteria so as to ensure the continued protection of classified uses, the Commission became aware of the fact that there may be a significant number of segments where the numeric temperature criteria are being consistently exceeded, at least on a seasonal basis, in the absence of impacts from point source discharges or controllable nonpoint sources, yet the aquatic life use continues to be attained. In these cases of natural or irreversible human-induced exceedances of the numeric criteria, the Commission desired to identify an option to retain and protect the existing uses, but avoid the need for inappropriate section 303(d) listings. Thus, it adopted a footnote providing that a narrative table value criterion for temperature that can be applied in such situations to site-specific waters, where there is a demonstration that exceedance of numerical criteria results from natural or irreversible human-induced impacts. Implementation of this provision will be further addressed in the temperature standards guidance to be developed by the Division.

Implementation in Discharge Permits

Modifications were made to section 31.14 to record the Commission's intentions regarding how the Colorado temperature standards will be implemented in discharge permits.

The DM standard is to be applied so that there is attainment of the DM at the edge of acute regulatory mixing zone. The MWAT is to be applied so that there is attainment of the MWAT at the edge of the chronic regulatory mixing zone.

Spawning criteria are to be applied on a seasonal basis where the Division determines that the habitat that will be affected by the physical mixing zone is suitable for spawning by fish species that are expected to be present.

The Commission also determined that temperature effluent limits would not be required for discharges to dry streams that only have flowing water in response to precipitation (effluent dependent streams). This provision is only valid if there is no evidence that the aquatic life use may be negatively affected by the discharge. A definition of effluent dependent streams was added to section 31.5.

Determination of Attainment

The Commission intends that the temperature standard be evaluated against representative instream data. Temperature varies within a reach both spatially and temporally. Data should be taken from a location in the stream that is representative of the reach, not in locations that may be substantially warmer or cooler than the rest of the segment – e.g. backwater habitats, eddies, deep pools, or refugia. Temperature also varies throughout the day. Attainment of the DM standard is based on temperature readings taken from the warmest part of the day – typically in the afternoon. Attainment of the MWAT standard is based on equally spaced data throughout the day including the warmest part of the day.

## I. Ammonia Table Values (section 31.16 Table II)

The Commission adopted revised ammonia aquatic life criteria, based on EPA's 1999 Update of Ambient Water Quality Criteria for Ammonia. Colorado's previous table value criteria for ammonia were adopted in the late 1980's and have not been revised since. The new criteria are in the form of total ammonia rather than unionized ammonia and generally represent a less stringent criterion in cold-water segments but a more stringent criterion in warm-water segments.

After lengthy discussions between the Division and Colorado Water Quality Forum's Basic Standards Work Group of EPA's 1999 criteria and alternative approaches, the Division determined that the 1999 criteria would be appropriate for Colorado. Based on the evidence submitted in this hearing, the Commission agreed.

**Acute Criteria** - Salmonids Present (sp) or Absent (sa): The Commission intends that, generally, the acute criteria be applied along cold or warm water classification lines. On a case-by-case basis, where evidence has been presented, the Commission may decide that salmonids (trout) are present in warm water segments or absent in cold water segments.

**Chronic Criteria –** Early Life Stage Present (Elsp) or Absent (Elsa): The early life stages include the pre-hatch embryonic period, the post hatch free embryo or yolk-sac fry, and the larval period, during which the organism feeds. Juvenile fish, which are anatomically rather similar to adults, are not considered early life stages. Since ammonia is less toxic to juvenile and adult fish than at earlier life stages, a somewhat relaxed criterion is available for use when early life stages are expected to be absent from the aquatic ecosystem.

The Commission found that for cold water streams, early life stages could reasonably be expected in any month, therefore the default assumption will be that the chronic Elsp criterion will apply to cold water streams all year. This assumption can be modified on a site-specific basis where appropriate evidence is submitted.

For warm water streams, early life stages could reasonably be expected in March through August. The default assumption will be that the chronic Elsp criterion will apply from March 1 through August 31, and the Elsa criterion will apply from September 1 through February 29. This assumption can be modified on a site-specific basis where appropriate evidence is submitted.

The Commission acknowledges that there will be a substantial cost of compliance with the new criteria for some entities, once the criteria are adopted as standards in individual basins and implemented in discharge permits. Economic impacts on a per capita basis may be most significant for small communities located on warm water streams and currently using lagoon treatment systems.

Anticipating a potentially significant cost of meeting the EPA criteria, the Division and others have explored whether other scientifically valid approaches to ammonia criteria are available. However, all parties involved have been unable to identify any alternative for statewide criteria that would be less costly and meet the requirements of the federal and state law by assuring protection of aquatic life uses.

The Commission believes that it will be important for all involved to explore options to mitigate the economic burden of meeting the new ammonia criteria. In some instances, consideration of site-specific criteria may be appropriate, so long as any such criteria are consistent with federal and state requirements to protect existing aquatic life uses. It also will be appropriate when applying the new criteria as standards in the individual basins to consider the adoption of temporary modifications that provide a reasonable and adequate amount of time for affected municipalities to address the planning, financing and construction that may be needed for upgrading treatment facilities. We encourage the state legislature to explore the possibility of state grant funds to provide financial assistance, particularly to small communities faced with significant costs to meet the new ammonia criteria.

**J. Metals Table Values and Implementation Issues (section 31.16, Table III)**

Several changes are adopted with respect to the metals table values set forth in Table III. The metals parameters that changed include aluminum, antimony, arsenic, cadmium, uranium and zinc.

Aluminum : A footnote was added to the chronic aluminum value to explain the application of the standard. Application of the 87 µg/l total recoverable aluminum chronic table value is based on toxicity studies with brook trout and striped bass. The studies underlying the 87 µg/l chronic value, however, were conducted at low pH (6.5-6.6) and low hardness (<10 ppm $CaCO_3$), conditions uncommon in Colorado surface waters. A water effect ratio toxicity study in West Virginia indicated that aluminum is substantially less toxic at higher pH and hardness (although the relationship is not well quantified at this time). Further, field data indicate that many high quality waters in the U.S. contain more than 87 µg/l aluminum when either the total recoverable or dissolved aluminum is measured. Based on this information and considering the available toxicological information in EPA's Aluminum Criteria Document (EPA 440/5-86-008), the 87 µg/l chronic table value standard for aluminum will be implemented as follows: where pH is equal to or greater than 7.0 and hardness is equal to or greater than 50 ppm as $CaCO_3$ in the receiving water after mixing, the 87 µg/l standard will not apply, and aluminum will be regulated based on compliance with the 750 µg/l acute standard. In situations where the 87 µg/l chronic standard applies, a discharger may propose a site- specific chronic standard based on a water effect ratio.

Arsenic: Arsenic table values for drinking water supply, W+F and FI were updated to reflect the classification of arsenic as a Class A carcinogen by EPA, in accordance with Policy 96-2. The Commission during the recent adoption of Basic Standards for Organic Chemicals for Regulations 31 and 41 has allowed for two drinking water supply standards. The same approach is being applied in this hearing to metals table standards. The first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level (MCL), established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality

target, provided that no effluent limitation shall require an “end-of-pipe” discharge level more restrictive than the second number in the range. 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. The Drinking Water Supply table values are applicable at the point of intake to a domestic water supply.

Water + Fish (W+F) and Fish Ingestion(FI) Table Values :

Table values for antimony are updated to reflect a revised relative source contribution for both W+F and FI. The antimony W+F standard was updated to reflect the change in increasing the fish consumption rate numbers adopted by the Commission on 9/14/2004 at the hearing regarding organics for Regulation 31.

Table values for copper, nickel, selenium, thallium, and zinc were updated to reflect water quality criteria developed under the CWA section 304(a) and published in EPA National Water Quality Criteria: 2002.

Cadmium: The Commission considered alternative revised acute and chronic aquatic life table values. Using the results from the most recent literature review, it adopted new hardness based equations for cadmium. This review resulted in two separate acute equations: one for waters that have trout and one for waters that do not have trout. The Commission also adopted a revised hardness based chronic equation that resulted from the most recent literature review. Although the revised acute and chronic equations differ slightly from EPA’s national criteria, they more accurately reflect the current science and are protective for Colorado’s waters.

Uranium: A drinking water supply table value for uranium was added, in accordance with Policy 96-2. Since there is no bio-concentration factor (BCF) available, no W+F or FI criteria are proposed. A conversion of pCi/L to mg/L was developed. The conversion factor of 670 pCi/mg natural uranium, which assumes secular equilibrium of U-234 and U-238, will be used to provide for consistent interpretation of data. When uranium activity units are used (e.g. pCi/L), they will be converted to milligrams by dividing by 670. The current uranium standard of 40 pCi/L or 59.7 µg/l (when divided by 670 pCi/mg) is greater than the new MCL (drinking water supply standard). As each individual basin regulation is reviewed, the uranium standard will be changed from 40 pCi/L to 30 µg/L in the basinwide standards at the beginning of each regulation.

Zinc : The Commission adopted alternative revised zinc aquatic life table value hardness-based equations. These differ slightly from EPA’s national criteria. However, they more accurately reflect the current science by inclusion of acute and chronic data for sculpin and are protective for Colorado’s waters. The Commission notes that more protective standards may be adopted on a site-specific basis when appropriate to protect sculpin.

Hardness footnote (footnote 3): The Commission clarified how hardness is to be determined for permit effluent limitations and for determining standards attainment.

**K. House Keeping Issues**

1. Clarifications : The Commission added clarification to a number of items:

Segment descriptions, unless specified by the Commission, are to mean that any boundary location means “immediately above” that reference, except when the boundary location is referred to as “source” .

The Commission clarified the methodology to be utilized in assigning ambient quality based standards.

The Commission added a definition of “existing quality” to section 31.5. This is the same definition that can be found at 31.8(2)(a)(i). It was added to the definitions because it has broader applicability than merely the antidegradation provisions.

The Commission added a footnote to the pH standard, which addresses judging when attainment is achieved, and when the appropriate averaging period can be applied.

The provision at 31.14(9) that addresses PQLs was revised in light of the removal of PQLs from the Regulation for the State Discharge Permit System (Regulation No. 61). Generally applicable PQLs now reside in a Division policy document. In addition, site-specific PQLs can be developed in accordance with Division policy.

2. The Commission corrected minor typographical errors in the regulation.

**II. Paonia Colbran Proposal**

The Commission has modified Section 31.9 to address an issue regarding the methodology used to calculate monthly low flows for streams experiencing large seasonal variability in in-stream flows. That section now provides that, when requested by the discharger, a specific method for calculating low flows during such periods is to be used.

Currently, the Division uses a modified version of a low flow model, commonly referred to as the “DFLOW model,” which was developed by the U.S. Environmental Protection Agency. The DFLOW model was developed by EPA to establish an empirical “biologically based” annual low flow. The model calculates a harmonic mean for each consecutive, forward rolling, 30-day period for the period of record being considered. An excursion procedure is applied to establish an annual low flow which is expected to occur at a frequency of no greater than once every three years (see EPA, 1986. Technical Guidance Manual for Performing Waste Load Allocations, Book VI, Design Conditions: Chapter 1 - Stream Design Flow for Steady-State Modeling, Appendix C - Office of Water Regulations and Standards).

The Division modified the EPA DFLOW model to calculate monthly low flows for use in determining monthly effluent limitations. In calculating monthly low flows, the Division assigns to a month of interest all harmonic means that include one or more days in that month. This procedure can result in the calculated low flow for the month in interest being unduly influenced by the flow data from the preceding or succeeding month.

In order to reduce the influence of flows outside the month of interest during seasons of highly variable flow, the Commission adopted a revised procedure. That procedure uses only those consecutive 30-day harmonic means which contain at least 15 days from the month of interest to determine the low flow for that month. The Commission also determined the 1986 EPA Technical Guidance Manual sets forth the most appropriate excursion procedure and that such procedure should be used by the Division, when requested by the discharger, in calculating the annual 30E3 low flow. Appendix A to Section 31.9 sets forth the excursion procedure and is derived from the 1986 EPA Technical Guidance Manual. The low flow for a month of interest is then set at either the lowest harmonic mean assigned to that month, or the annual low flow value (using the procedure set forth in Appendix A), which ever is greater.

The Commission concluded that the revised methodology will more accurately reflect average in-stream low flow conditions during transitional flow months.

The Division’s current practice is to use the most recent ten years of flow data in establishing low flow conditions. The Commission recognized that, in most instances, the period of record (POR) of available data might be different than ten years. The Commission also recognized that the determination of low flows based on the most recent ten years of flow data could be biased by the predominance of wet or dry cycles within the ten year period, and that such bias could be reduced by the use of a longer period of record. Where the period of available flow data exceeds ten years, the Commission would expect the Division to consider using such POR. In such instances, the Commission would expect the Division to evaluate whether changes (for example, anthropogenic changes such as dams or diversion structures) have occurred in the stream system that would make it inappropriate to use such longer POR. The Commission also determined that, where ten years of data does not exist, the use of a period of record of

less than ten years may be appropriate to establish low flow conditions, particularly where less accurate methodologies such as “similar basin” approaches would otherwise be used. Determination of the appropriate period of record for calculating low flow conditions outside the Division’s normal practice will likely be based on a case-by-case request by the discharger. In these situations, the Commission would expect the Division to work with the discharger to determine the most appropriate period of record for calculating low flow conditions.

## III. Colorado Water Congress Proposal Regarding Mixing Zones

Section 31.10, “Mixing Zones” in the Basic Standards Regulation (Regulation 31) provides the regulatory basis for defining and implementing mixing zones in discharge permits (“mixing zone rule”), Section 31.10 (5) of the mixing zone rule entitled “Additional Constraints on Mixing Zones” includes the following provision:

> (d) The Division may limit or deny regulatory mixing zones on a site-specific basis for specific regulated substances. In doing so, the Division shall consider the following:
>
> > (iii) The special importance of certain habitats such as fish spawning or nursery areas or habitat that supports threatened or endangered species;

In February 2002, the Water Quality Control Division issued the “Colorado Mixing Zone Implementation Guidance” (Water Quality Control Division, February 2002). Appendix IV, entitled “Mixing Zone Guidance for Water for Threatened and Endangered Species,” describes the manner in which the Division will work with the EPA and the Service to provide compliance with the Endangered Species Act for permits to discharge to waters that include threatened or endangered species.

EPA’s approval of the mixing zone rule (May 16, 2002) was subject to compliance with the Endangered Species Act, given that EPA determined that the rule may adversely affect Colorado pikeminnow, humpback chub, bonytail, razorback sucker, and greenback cutthroat trout, and may affect critical habitat of these species. By letter dated September 16, 2002, EPA requested a formal consultation with the U.S. Fish and Wildlife Service regarding approval of the mixing zone rule.

On August 11, 2003, the U.S. Fish and Wildlife Service issued a biological opinion based on its review of EPA’s approval of Colorado’s amended mixing zone rule (Exhibit 2). Seven conservation measures are identified in the August 11, 2003 biological opinion.

Conservation measure No. 2 acknowledges that there may be situations where there are no feasible alternatives that would entirely avoid adverse impacts to listed aquatic species. In these cases, the project applicant will be asked to implement a conservation plan to minimize anticipated impacts. In such cases, the Service provides that it will issue a supplemental biological opinion, acknowledging the unavoidable nature of the issue, acknowledging the implementation of the conservation plan, and authorizing take for that permit. Federal regulations also allow the Service to specify reasonable and prudent measures in a biological opinion to minimize incidental take (50 CFR 402.14).

Conservation measure No. 2 was not included as an option in the revised Mixing Zone Guidance developed by the Division, as the Guidance preceded the biological opinion. In addition, neither the guidance nor the biological opinion recognized other regulatory options that may be available under the federal Endangered Species Act, such as issuing a biological opinion with reasonable and prudent alternatives, or issuing a programmatic biological opinion dealing with more than one permit.

Conservation measure No. 7 also states that site-specific modifications to eliminate or minimize adverse effects can include:

- effluent diffusers,

- application of numeric standards at end of pipe, or
- relocation of the discharge and associated mixing zone.

Conservation measure No. 7 is recognized in the Mixing Zone Guidance document.

The Commission received requests from parties to the hearing to modify the mixing zone rule to address the terms of the biological opinion and other available regulatory options. Prior to the hearing, those parties and the Division agreed that the proposed modifications would be withdrawn and that it is appropriate to modify the Mixing Zone Guidance to incorporate provisions from the biological opinion, and provide for use of other federal regulatory options that may be available under the Endangered Species Act. The Commission supports this approach and recognizes that the Division will need to present it to the US Fish and Wildlife Service and EPA for their comment and make any appropriate changes prior to bringing a revised version of the Mixing Zone Guidance before the Commission for public comment.

PARTIES TO THE RULEMAKING HEARING

1. Town of Paonia
2. Town of Collbran
3. Colorado Water Congress Special Project on Basic Water Quality Standards
4. The Supervisory Committee of the Littleton/Englewood Wastewater
5. The City of Colorado Springs and Colorado Springs Utilities
6. Trout Unlimited
7. The City of Pueblo
8. Chatfield Watershed Authority
9. Bear Creek Watershed Association
10. City of Boulder
11. Town of Hotchkiss
12. Town of Olathe
13. Colorado Wastewater Utility Council
14. Upper Gunnison River Water Conservancy District
15. Colorado River Water Conservation District
16. Atlantic Richfield Company
17. The City of Westminster
18. The Board of Water Works of Pueblo, Colorado
20. Western Slope Water Network
21. High Country Citizens' Alliance
22. The City of Grand Junction
23. City of Black Hawk
24. Colorado Rock Products Association
25. Parker Water and Sanitation
26. Sky Ranch Metropolitan District No. 2
27. Eastern Adams County Metropolitan District
28. City of Loveland
29. The Board of County Commissioners of the County of Gunnison, Colorado
30. City and County of Denver acting by and through its Board of Water Commissioners
31. Gunnison County Stockgrowers Association, Inc.
32. Colorado Division of Wildlife
33. Pioneer Natural Resources USA Inc.
34. The Northern Colorado Water Conservancy District
35. Metro Wastewater Reclamation District
36. Tri-State Generation and Transmission
38. City and County of Denver
39. The Southwestern Water Conservation District
40. The South Adams County Water and Sanitation District
41. North Front Range Water Quality Planning Association

42. Shell Frontier Oil & Gas Inc
44. The Farmer's Reservoir and Irrigation Company
45. Hot Springs Lodge and Pool
46. U.S. Environmental Protection Agency Region VIII
47. The Denver Regional Council of Governments
48. The Northwest Colorado Council of Governments

## 31.45 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: January 2007 Rulemaking Hearing; Final Action February 12, 2007; Revisions effective July 1, 2007

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

In this rulemaking, the Commission adopted new temperature criteria for Colorado's surface waters. The revisions to the regulation and definitions, revised table values and qualifiers, and revised implementation provisions. In this rulemaking, the Commission also adopted revisions to the basinwide temperature standards in Regulation Numbers 32 – 38.

**Overview:** As the Commission indicated in the 2005 Statement of Basis and Purpose, the basis of the original temperature standards had become unclear, the standards had been inconsistently applied in permits and there had been disagreements about how the attainment of these standards should be assessed. In adopting these revisions, the Commission has established criteria that are clear and can be consistently and fairly implemented by the Division. Section 31.14(14) was amended to establish general criteria to be followed by the Division in determining when effluent limits related to temperature are necessary in discharge permits. These criteria are intended to assure that effluent limits are imposed only when thermal discharges can reasonably be expected at a level such that the applicable standards would be threatened or exceeded.

Temperature standards will also be implemented in the context of determining attainment of standards in individual water bodies, for instance in the context of the biennial compilation of the "List of Impaired Water Still Requiring TMDLs" (the Section 303(d) List). Methods and process for determining of attainment of the temperature standards will be consistent with the Section 303(d) Listing Methodology as adopted by the Commission for that particular listing cycle.

**Water Rights:** Concerns have been raised regarding the potential impact of the proposed temperature criteria and standards on the exercise of water rights. The Commission included a reference to section 25-8-104, C.R.S. in the revised table value criteria. Section 25-8-104 states in part that "Nothing in this article [the Colorado Water Quality Control Act] shall be construed, enforced or applied so as to cause or result in material injury to water rights."

In cases where it is determined that the classified aquatic life use is adversely impacted by any pollutant, the Commission believes that it is appropriate to place the impacted segment on the Section 303(d) List. When a segment is placed on the 303(d) List for any reason, the Division (along with any interested parties) then investigates the source of the impairment. If the cause of non-attainment is deemed to be natural or irreversible man-induced, then a site-specific standard is appropriate. See Regulation 31.7(1)(b)(ii), 5 CCR 100-31, section 31.7(1)(b)(ii). In cases where a temperature standard exceedance is determined to be caused by the valid exercise of those water rights and the exceedance cannot be eliminated in a manner consistent with CRS 25-8-104, the Commission would consider that to be an irreversible man-induced condition, and thus would support adoption of a site-specific standard as provided in section 31.7(1)(b)(ii).

Similarly, Colorado's 401 certification regulation (Regulation No. 82.5(6)) provides that 401 Certification shall not be denied where the imposition of conditions or denial would result in material injury to water rights as prohibited under section 25-8-104, C.R.S. In such case, the Division, the project proponents, and any commenters are to examine and implement, where appropriate, any means to prevent, reduce, or mitigate water quality impacts identified during the permitting process and associated with the exercise of valid water rights. Where such means are found they may be included in the Division's certification determination. This process would apply to temperature standards in the same manner as other water quality standards.

**Definitions:** Definitions were added to section 31.5 for terms used in the context of revised temperature standards. Pre-existing definitions were renumbered.

**Low-Flow Exemptions:** Language was added to section 31.9(1) to clarify that for calculation of chronic temperature effluent limits for permits, a 7-day average low flow with an average once in three-year recurrence interval (7E3) will be used. This statistic is appropriate since the chronic temperature criteria (the MWAT) has a seven day averaging period and a once in three-year exceedance frequency.

**New Temperature Table Values:** One result of the 2005 Basic Standards hearing was a focused effort on developing a sound methodology, re-reviewing the laboratory-based temperature effect literature, and developing a new, more robust temperature database. The methodology for developing temperature criteria was the subject of an Administrative Action Hearing in April, 2006, that resulted in adoption of WQCC Policy 2006-1: Temperature Criteria Methodology. The Policy is intended as a general informational guide of the Commission's approach to the adoption of these criteria and standards. As stated in the Policy, it is not intended and should not be interpreted to limit any options that may be considered or adopted by the Commission in future rulemaking proceedings.

The new table values, adopted in this hearing, were developed using the laboratory-based studies of individual fish species' tolerance to elevated water temperatures. For each aquatic community, the tolerances were ranked and the 5th percentile was selected as the operative criterion, except in the case of coldwater aquatic life.

**Cold Water Numeric Criteria:** The cold water criteria were generated using laboratory generated thermal tolerance information for the following cold water species: Arctic grayling, brook trout, brown trout, cutthroat trout, mottled sculpin, longnose sucker, rainbow trout, and sockeye salmon. The lake trout and mountain whitefish are also present in Colorado, but insufficient thermal data were available to consider them in numeric criteria development. The fish species were grouped into two communities "Rivers and Streams" (all the species except lake trout and sockeye salmon) and "Lakes and Reservoirs" (see below). Other groupings, including east and west slope were investigated, however provided no significant difference in criteria. For "Rivers and Streams" the Policy 2006-1 methods, 5th percentile did not fully protect cutthroat trout (the most sensitive species). Since cutthroat trout are an ecologically important species in cold-water communities, and are the only native trout species in Colorado, the cold criteria were lowered to ensure full protection of that species. The Commission anticipates that as the Division and interested parties continue to collect thermal tolerance studies, the database will become more robust and these decisions will be revisited.

A specific large lake and reservoir category was created for lakes and reservoirs equal to or larger than 100 acres in size, which is consistent with CDOW's management regime where lakes and reservoirs are grouped into one of three size classes: < 100 acres, 100-500 acres, or > 500 acres. Lakes and reservoirs larger than 100 acres typically do not contain brook or cutthroat trout. The summertime criteria for this category are based on protection of rainbow trout. Site-specific standards can be applied to the few large lakes and reservoirs that do contain thermally sensitive fish, such as cutthroat trout, brook trout, sockeye or arctic grayling. The Commission believes that having two separate cold-water lakes and reservoirs standards will protect thermally-sensitive fish in their natural habitat and in small lakes and reservoirs where they may be stocked by CDOW while exempting larger lakes and reservoirs from overly restrictive temperature standards.

**Warm water numeric criteria:** The warm water numeric criteria were developed using laboratory-based temperature studies of fish species. As with development of the cold criteria, several community groupings were evaluated. With the current data, it was determined that criteria for four river and stream sub-classes and one lake class would be promulgated. The default “Rivers and Streams” criteria are based on information about the Arkansas darter, bigmouth shiner, black bullhead, bluegill, boneytail, brown bullhead, channel catfish, fathead minnow, golden shiner, green sunfish, hornyhead chub, longnose dace, orangespotted sunfish, plains killifish, plains minnow, plains topminnow, pumpkinseed, red shiner, roundtail chub, sand shiner, smallmouth bass, southern redbelly dace, speckled dace, spottail shiner, western mosquitofish, and yellow bullhead. The following species are also present in Colorado, but insufficient thermal data were available to consider them in numeric criteria development for rivers and streams: bluehead sucker, brassy minnow, Colorado pikeminnow, common carp, flannelmouth sucker, flathead catfish, flathead chub, freshwater drum, Iowa darter, quillback, Rio Grande chub, Rio Grande sucker, river carpsucker, smallmouth buffalo, and stonecat.

Three additional sub-classes (a, b, and c) of sensitive warm water species were created to protect thermally sensitive warm water species with similar thermal requirements or geographic distribution. Existing data for these species indicate that they are sensitive to chronic high temperatures, relative to other warm water fish. If these species were included with the other warm-water river and stream species, following Policy 2006-1, the resulting criteria are over protective for waters without these thermally sensitive species. Since the range of these species are known, the Commission decided that it was more appropriate and will provide flexibility to create a separate subclass rather than have interested parties outside the range of thermally sensitive species to have to go through the recalculation procedure. The Commission directs the Division to rely upon information from the Colorado Division of Wildlife for determining where thermally sensitive species are expected to occur at the site.

Where thermally sensitive species occur, or are expected to occur, the most protective applicable criteria will be used. Warm-water sensitive group a is the most thermally sensitive and includes the common shiner, Johnny darter, and orangethroat darter. The common shiner and Johnny darter specifically occupy the eastern slope transition zone. The orangethroat darter occurs only in the Republican River Basin. Warm-water sensitive group b includes only the razorback sucker that occurs on the west slope. Warm-water sensitive group c includes the brook stickleback, central stoneroller, creek chub, longnose dace, Northern redbelly dace, finescale dace and white sucker. The default warm-water table value will apply in segments that do not have, and are not expected to have, any of these thermally sensitive species.

The “Lakes and Reservoir” criteria are based on information about the bluegill, largemouth bass, northern pike, pumpkinseed, smallmouth bass, spottail shiner, striped bass, tiger muskellunge, walleye, white bass, and yellow perch. The following species are also present in Colorado lakes and reservoirs, but insufficient thermal data were available to consider them in numeric criteria development for lakes: black crappie, common carp, gizzard shad, sauger, wiper, and white crappie.

The Commission acknowledges that all of these fish species do not occur in all warm water locations. For instance, the white bass only occurs in east slope reservoirs, and channel catfish generally occur in warm water lakes, reservoirs, ponds, and moderate to large rivers. Neither of these may be appropriate in some locations on the western slope. However, rather than include all the combinations in Table 1, the Commission adopted table values for five subclasses. The revised regulation allows for refinement of criteria on a site-specific basis using the recalculation procedures in Policy 2006-1 without the burden of a Commission hearing. This provides the Division and interested parties the flexibility to develop site-specific solutions based on the species that are expected to occur at the site.

**Occur at the Site:** The Commission intends that the phrases “occur at the site” and “expected to occur at the site” have the same meaning as in WQCC Policy 2006-1 (see Section XII, Recalculation Procedures), and shall be determined on a site-by-site basis. The Commission requests that the Division consider further appropriate refinement of this concept in the development of implementation guidance, including but not limited to appropriate consideration of fish only temporarily present in transition segments.

**Spawning/Reproductive Seasons:** The Commission revised the provisions to protect spawning in order to broaden the consideration to all the reproductive functions. The consideration of reproductive season is to ensure that the thermal requirements for successful migration, spawning, egg incubation, fry rearing and other reproductive functions are met These particular life stages and behaviors warrant more protective criteria than those required for the young adult and adult life stages; however, there are many site-specific considerations. The Commission decided to provide protection for these life stages in combination with protection of seasonal patterns as discussed below.

**Winter Criteria to Protect Reproductive Functions and Normal Pattern of Seasonal Fluctuation:** The original language of the temperature standard contained the requirement that "temperature shall maintain a normal pattern of seasonal fluctuation." This component is intended to preserve thermal cues necessary for protection of aquatic life cycles. After consideration of alternative means to protect seasonal patterns, the Commission chose an approach that links protection of the seasonal pattern with protection of reproductive functions. To this end the Commission added winter season table value criteria in Table 1. The default winter season for cold water river and streams was established from October to May, November to March for "not sensitive" cold water rivers and streams, and for warm water rivers and streams from December to February. The winter season for lakes and reservoirs for both cold and warm water was established from January to March.

**Normal Pattern of Summertime Diel Fluctuation:** The narrative provision contains the requirement that temperature shall maintain a normal pattern of summertime diel fluctuation. The addition of "summertime" represents a modification of the longstanding language in the Basic Standards. While it is clear that aquatic life need nighttime cooling during the summers, to allow recovery from daily afternoon high temperatures, it is not clear that this recovery period is necessary during the rest of the year. A single value to protect summertime diel fluctuation would not address the myriad site-specific conditions, and so the Commission is relying upon the narrative statement. The Division is directed to impose permit conditions where best professional judgment indicates such protection is necessary to protect the use.

**Normal Pattern of Spatial Diversity:** The narrative standard also contains the requirement that temperature shall maintain a normal pattern of spatial diversity. Spatial diversity is a concept that incorporates the importance of a distribution of conditions along the stream reach. Natural aquatic ecosystems have a range of temperatures available to organisms in microhabitats. This array of microhabitats makes it possible for a broader range of organisms and life-cycles to flourish in the aquatic system. Although spatial diversity is critical to a fully functioning aquatic community, the Commission does not see a way to quantify or define the lower threshold in regulation at this time. The Commission's intent is that the Division use its discretion to implement the narrative requirement for spatial diversity in situations where there is evidence that an activity does or will create spatial uniformity that will threaten or impair the aquatic life use.

**Abrupt Changes / Thermal Shock:** The thermal shock provisions were reviewed and revised. Even though there is a need to provide clear direction for implementation of the narrative prohibition of abrupt changes, the complexity of the phenomenon and the confusion over implementation indicate that Colorado is not yet ready for a numeric thermal shock criterion at this time. The Commission directs the Division to continue to explore means to protect aquatic life from anthropogenic thermal shock, with particular emphasis on an implementation strategy that is straightforward. The Commission expects to see a revised thermal shock proposal in the 2010 Basic Standards rulemaking proceedings. In the meantime, the Division is directed to impose permit conditions where best professional judgment indicates protection is necessary to protect the use from abrupt thermal changes.

**Transition Zones:** In 2005, the Commission adopted the cool water ("cw") qualifier to acknowledge that temperature regimes are a continuum and the transition between cold and warm is not abrupt. The Commission endorses recognition of the transition zone, but decided that rather than having separate criteria for the transition zone, it is more appropriate to wait for the results of the Aquatic Life Work Group's effort to propose refined aquatic life uses. To help assure a reasonable approach in the interim, the Commission believes that the flexibility provided by resegmentation, recalculation of standards at the time of permit renewal, and the tools available at 31.7(1) are adequate. On a case-by-case basis,

appropriate standards can be established at the upper end of warm water segments and the lower end of cold water segments.

**Implementation Overview:** The Commission has identified an approach to the implementation of the temperature standards that attempts to strike a balance between: (1) the goal of having temperature standards in place in Colorado that will protect beneficial uses of our surface waters, particularly for aquatic life; and (2) the goal of minimizing the demands on internal and external resources in implementing temperature standards, in an effort to focus on instances where it is more likely that temperature may present a concern.

The Commission intends that implementation guidance will be developed by the Division to facilitate implementation of the narrative standard. However, the Commission does not intend that implementation of the new standard will be delayed pending finalization of such guidance.

**Role of Numerical Temperature Criteria and Site-Specific Numerical Standards:** The Commission has adopted numerical temperature criteria that have been included in Table I of these Basic Standards. These Table I criteria are established at levels that the record indicates will be generally protective of the beneficial use classifications. The Commission intends that the numerical table values will be used as the starting point for establishing segment-specific numerical standards for individual segments, while providing an opportunity for a demonstration that alternative site-specific standards are appropriate. Unlike pollutants that may occur at significant levels only rarely, such as beryllium or thallium, temperature is a parameter that can impact aquatic life in any waterbody. Therefore, the Commission anticipates that in the next round of triennial reviews, numerical temperature standards generally will be adopted for segments throughout the state.

Although the table value criteria adopted here will be used as the starting point for considering such standards, alternative site-specific standards may be appropriate. As outlined in the Basic Standards at section 31.7(1)(b), Ambient Quality-Based or Site-Specific Criteria-Based Standards may be adopted by the Commission. These situations include:

1. Ambient Quality-Based Standards may be established where evidence has been presented in accordance with subsection 31.7(1)(b)(ii): For state surface waters where evidence has been presented that the natural or irreversible man-induced ambient water quality levels are higher than specific numeric levels contained in tables I, II, and III, but are determined adequate to protect classified uses, the Commission may adopt site-specific chronic standards equal to the 85th percentile of the available representative data. Site-specific acute standards shall be based on the 95th percentile value of the available representative data. For temperature, chronic (MWAT) and acute (DM) standards will be set at a level that would be exceeded once in a three-year frequency.

2. The Recalculation Procedure: One option for determining appropriate site-specific standards is the use of a recalculation procedure, based on changes to the database used to calculate standards, where there is a determination that certain aquatic species do not occur and are not expected to occur at a particular location. The Division has developed an acceptable recalculation procedure, modeled after EPA's recalculation procedures. That procedure is set forth in the Temperature Criteria Methodology, Policy 2006-1.

3. Site-specific Narrative Standards: As provided in section 31.7(1)(c), narrative standards may be adopted on a site-specific basis. The Commission believes that numeric temperature criteria are not required under federal law and that this section provides authority to promulgate narrative temperature standards on a site-specific basis where convincing evidence is presented that the narrative statement will protect the uses. Although numerical standards generally provide more certainty to assure protection of the resource, a narrative standard may be appropriate where robust temperature and aquatic life data exist. Such a narrative standard proposal must include an implementation strategy.

The Commission notes that the adoption of site-specific standard may require resegmentation in some instances, e.g. to appropriately match numerical standards with changes in species compositions. The Commission also notes that in the initial round of basin hearings considering site specific temperature standards, in circumstances where there is concern about whether table value criteria are attainable, but there is inadequate information available – e.g. regarding ambient temperature levels or expected species composition – the adoption of temporary modifications pursuant to section 31.7(3)(a)(iii) may be appropriate.

**Attainment in Lakes and Reservoirs:** The Commission determined that when a lake or reservoir is stratified, the average temperature in the mixed layer may exceed the temperature criteria provided that an adequate refuge exists in a lower level. Adequate refuge exists when the lower levels meet both the temperature and applicable dissolved oxygen standards.

If the temperature criteria is not met in the mixed layer, and there is no adequate refuge, the lake or reservoir may be included on the 303(d) list as impaired for dissolved oxygen rather than temperature. The Commission recognizes that dissolved oxygen standards are intended to apply to the epilimnion and metalimnion, while dissolved oxygen in the hypolimnion may be less than the criteria due to natural conditions, although no reductions in dissolved oxygen levels are allowed due to controllable sources. Reg. #31, § 31.16, Table 1, Footnote 9.

**Implementation in Discharge Permits:** The provisions in section 31.14(14) have been revised to provide clarification regarding how temperature standards are to be implemented in discharge permits. The Commission added language to this section to emphasize that the Division will impose temperature effluent limits in permits only when the thermal energy in the discharge presents a significant threat to the standards.

Two general provisions were added to section 31.14(14) that provide exclusions from the circumstances where the Division will establish effluent limitations for temperature. First, no temperature effluent limitation will be applied if a discharge is to an effluent-dependent stream and there is no evidence that the aquatic life use may be negatively affected by the discharge. The Commission has determined that this provision is appropriate since ephemeral streams have no continuous flow and limited associated aquatic life, such that no adverse impact to aquatic life is anticipated.

Second, no temperature effluent limitation will be applied to a discharge of water from a natural hot spring, provided that the discharge is in the vicinity of the hot spring's natural outflow. The Commission determined that discharges of natural hot springs water do not have reasonable potential to cause significant adverse temperature impacts because the hot springs would flow directly into rivers and streams as natural heat sources if they were not diverted and used. A discharge will be considered to be "in the vicinity" of the natural outflow if it is to the same stream that would have received the hot springs flow under natural conditions and in the same general area that would have been affected by the natural flow of the hot springs.

For discharges that are not excluded by these two general provisions, the Division will conduct a reasonable potential analysis, to identify discharges with a potential to cause significant adverse temperature impacts. If this analysis shows that there is no reasonable potential for such impacts, no temperature effluent limitations will be established.

During the rulemaking hearing, there was consideration of an exclusion from temperature effluent limitations where it is determined that a discharger:

(a) has been in existence for at least 10 years, without a substantial increase in the quantity of its discharge;

(b) would not experience a substantial increase in the temperature of its discharge if a treatment process failure occurred;

(c) discharges effluent that only rarely exceeds the appropriate chronic temperature criterion in Table 1; and

(d) discharges to a receiving water that is not listed on the Section 303(d) List as impaired for aquatic life.

The Commission agrees that it is generally appropriate to exclude this class of dischargers, including, e.g., many municipal wastewater treatment plant discharges, from temperature effluent limitations based on the Commission's conclusion that this group poses a relatively low risk of causing adverse temperature impacts to aquatic life uses. Such an exclusion would not apply to discharges that have not been in place long enough to provide a substantial "track record" , discharges (such as power plants) that cool heated water prior to discharge, discharges that frequently exceed the default values in Table 1, and discharges on segments that have been identified as impaired for aquatic life. Rather than include this exclusion in the Basic Standards Regulation, the Commission has directed that the Division include an exclusion such as this as part of its reasonable potential guidance. In such guidance, the Division would retain the authority to determine, pursuant to a reasonable potential analysis, that individual discharges that meet the criteria of this provision nevertheless pose a risk of thermal impact to aquatic life that warrants the inclusion of effluent limits in a permit.

The Commission decided not to adopt an exemption from temperature limits for discharges covered by general permits as requested by the Colorado Rock Products Association. The Commission found that there was not adequate information to provide a blanket exemption for the several classes of discharges covered by general permits and that the need for temperature limits for these operations is appropriately determined during the permitting process. However, the Commission assumes that there may be several categories of discharges covered under current general permits that pose no threat to temperature standards, particularly those discharges for which there is a fair amount of dilution in the receiving water. Therefore, the Commission expects the Division to identify those classes of activities covered by general permits for which temperature is not a pollutant of concern and/or conduct a "class-wide" reasonable potential analysis to confirm whether temperature limits may be required.

Where a reasonable potential analysis determines that there is a potential to cause significant adverse temperature impacts, several results are possible. Barring information suggesting that an alternative result is appropriate, the Division will establish permit effluent limitations for temperature using the applicable temperature standards (either the basin-wide temperature standards that are listed at the beginning of each basin regulation or site-specific temperature standards that have been adopted). If the Division or a discharger believes that the effluent limitations resulting from such standards do not provide the appropriate level of temperature protection in a particular instance, three options are available.

First, the Division or a discharger may bring forth the results of a site-specific recalculation procedure analysis that supports variation from the applicable standards. As noted above, the recalculation procedure would need to be completed in a manner acceptable to the Division. An acceptable procedure is set forth in the Temperature Criteria Methodology, Policy 2006-1. This demonstration can be made at the time of permit application or for a standards hearing. When conducted as part of the permit renewal, the resulting recalculated standard should then be considered for formal adoption in the next regularly-scheduled basin-wide water quality standards rulemaking hearing or in a separate site-specific rulemaking, as determined appropriate by the Commission.

Second, a discharger could request a "section 316(a) waiver" , in accordance with the provisions added to section 31.14(14). This procedure has been established consistent with the provisions of the federal Clean Water Act and EPA's implementing regulations, to allow a discharge-specific waiver based on a showing that alternative effluent limitations will be protective of the classified aquatic life use. This provision applies to both domestic and industrial dischargers. The Commission anticipates that in the future, Regulation No. 61 may be revised to provide added detail regarding the requirements of this provision.

Third, the Division or a discharger may request that the Commission adopt a site-specific numerical or narrative standard that differs from the applicable temperature standard where it can be demonstrated that the alternative standard provides an appropriate level of protection of the classified aquatic life use. The showing required for this option would be similar to that for a section 316(a) waiver, except that the result would be a water quality standard that applies to a water segment as a whole, rather than a discharger-specific effluent limitation waiver. Such a standard could be considered in a regularly-scheduled basin-wide water quality standards rulemaking hearing or in a separate site-specific rulemaking, as determined appropriate by the Commission.

For discharges to lakes and reservoirs, since the location of the refuge cannot be predicted, the Division should develop permit limits assuming the appropriate temperature standard is in effect for the entire mixed layer. The daily maximum was retained to facilitate permitting thermal discharges to lakes and reservoirs.

**Implementation in the Section 303(d) Listing Process:** With respect to implementation in the section 303(d) listing process, the Commission will hold an Administrative Action Hearing in May 2007 to consider approval of the Listing Methodology for the development of a 2008 Section 303(d) List. The Commission's intent is that this Listing Methodology will provide that a segment's thermal condition will be evaluated based on the basin-wide temperature standards that are listed at the beginning of each basin regulation until such time as segment-specific standards are adopted in the course of the regularly scheduled triennial reviews or in a separate site-specific hearing.

**Ongoing review and refinement:** The Commission acknowledges that this temperature criteria and standards rulemaking has not answered all the questions regarding appropriate temperature standards for Colorado's waters and their applicability and implementation. More work needs to be done and as the Division and other interested parties gain experience with these provisions, the Commission anticipates that refinements to the system will be necessary. In particular, the Commission expects to see the results of the following in the course of the 2010 Basic Standards Rulemaking.

- Review and revision of Table Value criteria in recognition of newly available data.
- Consideration of numeric thermal shock provisions.
- Refined thinking regarding application of temperature standards to ephemeral and intermittent streams as they dry up.
- Reconsideration of how temperature standards are applied to transition zones.
- Review and reconsideration of the averaging period for the daily maximum.

PARTIES TO THE RULEMAKING HEARING

1. The Temperature Group (City of Aurora, City of Boulder, Colorado Springs Utilities, Littleton/Englewood Wastewater Treatment, The Metro Wastewater Reclamation District, Colorado Mining Association, Colorado Rock Products Association, Tri-State Generation & Transmission Assn., Xcel Energy, Denver Water, Northern Colorado Water Conservancy District, Southeastern Colorado Water Conservancy District)
2. City of Grand Junction
3. City of Loveland
4. City of Pueblo
5. Metro Wastewater Reclamation District
6. City of Aurora
7. City of Boulder
8. Colorado River Water Conservation District
9. Colorado Wastewater Utility Council
10. Bear Creek Watershed Association
11. Chatfield Watershed Authority
12. Mountain Coal Company, L.L.C.
13. Northern Colorado Water Conservancy District
14. Colorado Rock Products Association

15. Littleton/Englewood Wastewater Treatment Plant
16. Northwest Colorado Council of Governments
17. Southeastern Colorado Water Conservancy District
18. Colorado Mining Association
19. Colorado Division of Wildlife
20. South Platte Coalition for Urban River Evaluation
21. City and County of Denver
22. City of Colorado Springs and Colorado Springs Utilities
23. City of Westminster
24. Board of Water Works of Pueblo
25. Coors Brewing Company
26. City and County of Broomfield
27. Centennial Water and Sanitation District
28. Plum Creek Wastewater Authority
29. Climax Molybdenum Company
30. Cripple Creek & Victor Gold Mining Company
31. Tri-State Generation and Transmission Association
32. Xcel Energy
33. Sky Ranch Metro-politan District No. 2
34. Parker Water and Sanitation District
35. CAM-Colorado and CAM Mining LLC
36. Aggregate Industries – WCR, Inc.
37. Grand County Water and Sanitation District #1, Winter Park Water and Sanitation District, Winter Park West Water and Sanitation District and Fraser Sanitation District
38. Trout Unlimited and Colorado Trout Unlimited
39. Colorado Contractors Association
40. United States Environmental Protection Agency, Region 8
41. Hot Springs Lodge and Pool
42. Denver Regional Council of Governments

## 31.46 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 10, 2007 RULEMAKING; EFFECTIVE MAY 31, 2008

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 31.11(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to 31.11(3) were considered during the same hearing that addressed changes to the statewide Ground Water Organic Chemical Standards in Regulation No. 41 (Basic Standards for Ground Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to section 31.11(3) indicated that the water quality standards for two organic chemicals, toluene and 1,2-dibromoethane, needed to be revised.

At the last hearing addressing section 31.11(3), in September 2004, during which the Commission adopted water quality standards for several carcinogenic compounds, EPA had requested that a future rulemaking consider water quality standards for non-carcinogenic compounds. For this hearing the

Commission reviewed several non-carcinogenic compounds that lacked water quality standards. This review identified four pesticides for which the Commission elected to adopt water quality standards: acetochlor, dicamba, metribuzin, and prometon. Aquatic life-based standards for diazinon were also adopted, based on EPA guidance.

Nonylphenol: The Commission considered evidence presented in regards to the proposal to adopt aquatic life-based standards for nonylphenol. The Commission decided to adopt acute and chronic standards with a delayed effect date of 7/1/2010 as agreed to by the parties and the Division. This delay is intended to allow time for EPA, the Division and the parties to resolve uncertainty regarding the analytical methods for testing influent waste streams. Prior to the effective date, the Metro Wastewater Reclamation District, the City of Boulder, Littleton/Englewood and Colorado Springs Utilities have committed to working on source control of nonlyphenol with the commercial laundry sector through their Pretreatment Programs. For purposes of discharge permits, the Commission expects that, because of limitations in the available data, the Division will include effluent monitoring requirements in major permits issued prior to the delayed effective date. The monitoring requirement would become effective the same date that the standards became effective.

The Commission also corrected several typographical errors and added common synonyms for some of the organic chemicals.

PARTIES TO THE RULEMAKING

1. Centennial Water and Sanitation District, Town of Castle Rock, Castle Pines Metropolitan District, Consolidated Mutual Water Company, Rangeview Metropolitan District
2. Metro Wastewater Reclamation District
3. Colorado Wastewater Utility Council
4. City of Boulder
5. City of Colorado Springs and Colorado Springs Utilities
6. City and County of Denver Department of Environmental Health
7. Climax Molybdenum Company
8. Information Network for Responsible Mining (INFORM), High Country Citizens' Alliance (HCCA), and Coloradoans Against Resource Destruction (CARD)
9. United States Environmental Protection Agency, Region 8
10. U.S. Department of Energy (DOE) Office of Legacy Management
11. Upper Black Squirrel Creek Ground Water Management District

## 31.47 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: OCTOBER 13, 2009 RULEMAKING, EFFECTIVE DATE OF NOVEMBER 30, 2009

The provisions of sections 25-8-202(1)(b); 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for the amendments to this regulation adopted by the Water Quality Control Commission (Commission). The Commission has also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

### BASIS AND PURPOSE

In 2007, the Commission adopted aquatic life-based standards for nonylphenol with a delayed effective date of 7/1/2010. The purpose of the delayed effective date was to address uncertainties associated with analytical methods and possible source control options. The effective date for nonylphenol standards was identified as an issue for the June 2010 Basic Standards Rulemaking Hearing. In this written comment rulemaking, the Commission postponed the effective date for nonylphenol standards until January 1, 2011 to avoid implementation of these standards prior to their being addressed at the June 2010 hearing.

During its September 2004 rulemaking, the Commission adopted two standards for 1,4 dioxane -- 6.1 ug/L to be effective through March 21, 2010; and 3.2 ug/L to become effective on March 22, 2010. The dual standard was adopted, in part, due to the uncertainty about the risks posed by 1,4 dioxane and the

fact that EPA was in the process of updating the Integrated Risk Information System ("IRIS") database for that compound. At that time, the Commission adopted the 6.1 µg/L value (which had been typically used for remedial activities in Colorado) as a temporary standard in order to maintain the status quo for a period of five years to give EPA time to complete its IRIS update. The Commission determined that if EPA's pending review resulted in a change in the IRIS value, the Commission could consider a corresponding revision of its standards. As of this date, EPA has not completed the IRIS review.

In May 2009, EPA released an updated draft toxicological review on 1,4 dioxane for external peer review. According to the current schedule, final completion of the IRIS update should occur before the end of 2011.

In order to continue the status quo until EPA completes the IRIS update, the Commission is postponing the effective date for the more restrictive 1,4 dioxane standard of 3.2 ug/L from March 22, 2010 to March 22, 2012 to give EPA time to finish the IRIS update.

## 31.48 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 7-8, 2010 RULEMAKING; FINAL ACTION AUGUST 9, 2010; EFFECTIVE DATE JANUARY 1, 2011

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

### I. WATER QUALITY CONTROL DIVISION PROPOSALS

### A. Temporary Modifications

Background: In 2000, the Commission added "type iii" temporary modifications to section 31.7(3) to recognize that uncertainty regarding the underlying standard was an appropriate use of temporary modifications (see Statement of Basis, Regulation #31, at section 31.37, IV C,). In 2005, the Commission further revised section 31.7 to remove the distinction between the types of temporary modifications, clarify the durations of temporary modifications, and institute an annual review of temporary modifications. One of the primary purposes of these revisions was to focus attention on ending the need for the temporary modification as soon as possible (see Statement of Basis, Regulation #31, 31.44, I. D). These revisions resulted in a significant change in the Division's approach to temporary modifications, primarily in limiting the use of temporary modifications to situations where there are point source discharges that face unreasonable outcomes.

During the time that Colorado's temporary modifications regulatory provisions have been changing, EPA has also revised its policy regarding permit compliance schedules. Previously, it was thought that compliance schedules could be no longer than the term of the permit. This meant that attainment of underlying water quality standards had to occur by the end of the five-year permit term. EPA has recently revisited the issue and now says that compliance schedules can extend past the end of the permit term.

In the last few years, the Division has implemented the revised provisions both in the regularly scheduled basin hearings and in the new annual temporary modification review hearings. Various parties have expressed concern about the new practices. The current changes are the result of Standards Framework Work Group dialogue.

Organizational Revision of Section 31.7: The current 31.7(4) was deleted and the contents moved to other sections in 31.7. Overview language that was previously at subsection 31.7(4)(a) was moved to the beginning of 31.7 as an introductory paragraph, because it speaks to the process for all of the following subsections. 31.7(4) (b) was moved to the end of subsection (3) which addresses temporary modifications.

Commission Intent: The Commission continues to believe that temporary modifications are an important and useful water quality standards tool. The benefits of recognizing a short-term need for flexibility in the standards system is evident specifically where there are permitted dischargers on the segment.

The practical result of a temporary modification is to provide relief for permitted discharges until the time the uncertainty is resolved. The Commission continues to believe that it is more appropriate to focus resources on resolving the uncertainty rather than to focus on compliance with underlying standards that may not be appropriate.

Since temporary modifications have no impact on other aspects of Colorado's water quality management program such as the 303(d) list, the Non-point Source Program or the Total Maximum Daily Load (TMDL) Program, it is fitting that temporary modifications only be used where there are permitted discharges that would face unreasonable consequences in the absence of a temporary modification (e.g., a permit compliance schedule to meet a standard that is significantly uncertain).

Changes to the Regulation: The Commission revised the conditions for granting a temporary modification to specifically address the types of situations that warrant adoption of a temporary modification. Temporary modifications now explicitly provide time to resolve three types of uncertainty: 1) to determine what criteria is necessary to protect the use; 2) to determine whether the sources causing the impairment are correctable; and 3) determine how additional treatment will be provided.

The third condition, significant uncertainty regarding the timing of implementing attainable source controls or treatment, will be repealed on 1/1/2013. The Commission believes that that this type of uncertainty is better addressed through the discharger-specific variance provisions which will become effective on that date.

In addition to requiring one of the three types of significant uncertainty, the Commission revised section 31.7(3)(a) to establish that temporary modifications are authorized only if there is a demonstrated or predicted water quality-based effluent limit noncompliance problem. This requirement is intended to limit adoption of temporary modifications to situations where there is evidence that a discharger would face unreasonable consequences in the absence of a temporary modification.

The Commission also added section 31.7(3)(b) to provide additional detail on the factual information that must be submitted in support of temporary modification proposals. The Commission notes that Division has developed an initial checklist and expects that while it may be refined over time as necessary, the Division will begin to use it to document the information that justifies temporary modifications. It will help clarify the expectations for meeting the requirement that we are adding to the regulation. While it will help assure that there is a consistent approach to documenting the need for temporary modifications, the Commission recognizes that the level of effort will vary considerably with the site-specific situation.

The Commission modified section 31.7(3)(d) to clarify that the duration of a temporary modification is to be based on relevant factors including how soon resolving the issues that necessitated adoption of the temporary modification is deemed feasible. The Commission's intent is that it is important to consider site-specific information, e.g., the plan for resolving the uncertainty, in identifying an appropriate expiration date.

**B. Discharger Specific Variance Provisions**

In this rulemaking, the Commission adopted a new subsection in section 31.7 with a delayed effective date of January 1, 2013, establishing an option for the adoption of a discharger-specific variance in certain circumstances. Subsection (4) was added to section 31.7 to describe the process and criteria for granting, extending or removing variances. Subsection (17) was added to section 31.14 to explain how discharger-specific variances are to be integrated into discharge permits.

Overview: A discharger-specific variance establishes an alternative water-quality based effluent limit value that takes the place of a standards-based effluent limit for a specific point source discharge. Since technology-based effluent limits apply independently of water quality-based requirements, discharger-specific variances do not apply to technology-based effluent limits. Technology-based effluent limits must still be met, even where a discharger-specific variance has been established.

During the term of the variance, all other water quality standards not specifically modified remain applicable. Variances ensure that the highest attainable level of water quality is achieved. At the time of the periodic basin review, the basis for the discharger-specific variance must be reviewed to determine if there has been any change in the factors upon which the variance was granted.

Variances may be granted only where there are no feasible alternatives (e.g. pollutant reduction or elimination, seasonal retention, or land application) that would allow the regulated activity to proceed without a discharge that exceeds water quality-based effluent limits (WQBELs), In addition, the Commission intends that the effluent limits included with the variance require the highest degree of protection for the use classification that is feasible to achieve.

In most instances, variances are not appropriate for new discharges. This is because a broader range of alternatives are typically feasible for a new discharge than for an existing discharge. However, the Commission believes that there are a limited number of situations where variances for new discharges should be considered.

It is the Commission's intent that discharger-specific variances are to be used after other avenues (such as temporary modifications) have been shown to be inappropriate. As specified in subsection (4)(b)(ii), temporary modifications of standards must be considered before moving forward with a request for a discharger specific variance. Temporary modifications have been an effective tool in a variety of circumstances where standards are not net. The Commission is adding the discharger-specific variance option at this time because there is a limited set of circumstances where temporary modifications are not available or may not be the most effective water quality management tool.

Delayed Effective Date: The discharger-specific variance provisions will become effective on January 1, 2013. In the intervening time, it is anticipated that the Division, with input from interested stakeholders, will develop guidance to provide additional detail regarding the implementation of the discharger-specific variance provisions adopted by the Commission. The intent of the guidance is to make the discharger-specific variance adoption and implementation process more transparent and understandable to all interested parties, while providing appropriate flexibility.

Periodic Review Requirement: A discharger-specific variance acts as a revised water quality standard for a particular discharge and will be considered by the Commission in the context of water quality standards rulemaking proceedings. The variance will be reviewed in conjunction with the water quality standards review cycle that fulfills the triennial review requirements. If, at the Issues Scoping Hearing or Issues Formulation Hearing, it is determined that action is appropriate before the next scheduled basin-wide standards rulemaking hearing, a special hearing will be held.

Expiration Dates: Discharger-specific variances are temporary and will include an expiration date. In determining the appropriate duration for a variance, the Commission's primary consideration will be the site-specific basis for the variance and the potential for achieving more protective effluent concentration or load. Additional considerations will be the timing of the discharge permit renewal and basin review cycle.

Criteria for Granting a Variance: The Commission established three independent tests for determining whether a variance is warranted. One addresses situations where achieving a specific water quality-based effluent limit is not feasible because such treatment is beyond the limits of current technology. In these cases, the technology does not exist, or if it does exist, cannot treat to the levels that are required to meet water quality standards.

The second test relates to situations where achieving water quality-based effluent limits is not feasible because the costs of required treatment would cause substantial and widespread adverse economic and social impact. Facility-specific cost, affordability, and treatment information is necessary to support a decision that a discharger-specific variance is appropriate under this test.

The third test relates to the non-economic consequences of increased treatment, including the effects on other media such as air or land. The language of this test is the same as the 40 CFR 131.10(g)(3) downgrading factor. The Commission understands this test as weighing and balancing the tradeoffs between the environmental damage caused by (in this case) exceedance of effluent limits with the environmental damage caused by meeting those effluent limits. For consideration of this factor, the Commission expects to see discussion of considerations such as the fate and transport of the pollutant if the treatment works were not present, including the effect of the point source on the timing, concentrations and location of the pollutant's delivery to the receiving water.

The second element of the "other consequences" test relates to an assessment of the wider environmental impacts of increased treatment on other media as well as on water quality. For this element, there would need to be a demonstration that the increased treatment would cause more environmental damage than the benefits of meeting the standard warrant. The entity advocating this reason for a variance would need to demonstrate the basis for such a policy decision.

In addition to meeting one of these three tests to demonstrate need for the variance, the applicant for a variance must demonstrate that the conditions for granting a temporary modification are not met. Alternatively, if that demonstration cannot be made, in order to grant the variance, the Commission must make an affirmative determination that the variance is the most appropriate water quality management tool to address the site-specific circumstances. As noted above, temporary modifications have been an effective tool for many years. The Commission's intent is that, by adding the discharger-specific variance option at this time, progress can be made on the limited set of circumstances where temporary modifications are not available or may not be the most effective tool.

Selection of the Alternative Effluent Limits: A discharger-specific variance will be selected after an evaluation of the alternative pollutant removal techniques and consideration of the impact of the variance on the uses of the stream in the area of the variance and downstream of that area. Alternative techniques should include such options as pollutant reduction or elimination (for instance in industrial manufacturing processes or the pretreatment context), seasonal retention, land application and treatment process alternatives. The chosen option must provide the highest degree of protection of the classified use that is feasible in 20 years, taking into considerations the factors in subsection (4)(a)(i)(C), where appropriate.

Permits are to include "alternative effluent limitations" which represent the limits that can be achieved at full implementation of the chosen option. The alternative effluent limits may be adjusted as new information becomes available. In some cases, for instance where current pollution removal techniques represent the limits of technology, alternative effluent limits may correspond to the level currently attained.

In most cases, acute and chronic alternative effluent limits will be specified. However, on a case-by-case basis, it may be more appropriate to establish other duration-based limits.

During the term of the variance, it is the Commission's intent that the permit require progress towards meeting the alternative limit as quickly as feasible. Steps necessary to document that progress will depend on the facts of a specific situation and the basis for the variance. In some cases, investigation of treatment technologies should continue; in others, it may require long-range planning for wastewater reuse where allowed, or process modification.

Relationship with other regulatory provisions

Antidegradation: In situations where a discharger-specific variance would authorize water quality degradation and trigger the requirement for an antidegradation review, the alternatives analysis upon

which the selection of the interim limit was based can also be used for the antidegradation review. Since a demonstration that a current water quality standard is not attainable (required when a variance is considered) is a higher bar than demonstrating that protection of assimilative capacity beyond the standard is not required, it is likely that no additional analysis will be required.

Impaired Waters: As stated above, adoption of a discharger-specific variance constitutes a policy decision that, according to the terms of the variance, during the life of the variance the underlying standard does not need to be met. When a discharger-specific variance is adopted for an impaired water segment that is impaired by multiple sources, development of a TMDL would be required. The Commission intends that alternative effluent limits would establish the extent of regulatory requirements for the discharger in question, in accordance with the terms of the discharger-specific variance. Any impairments that are solely attributable to a duly authorized variance, are not to be included on the section 303(d) List. The section 303(d) List is the list of waters that still require a TMDL. In the case of impairments solely attributable to (and authorized by) a variance, a TMDL is not required since it is apparent why the water quality is impaired, and thus a TMDL is not necessary to identify the remedy for these waters. Cases where multiple sources contribute to an impairment would need to be examined on a case-by-case basis, and section 303(d) Listing may be appropriate.

Regulation #61: The Discharge Permit Regulations (at section 61.12(a)) specify the conditions under which the Division can grant variances. In the context of permitting, the Division may grant variances to non-federal standards (i.e. ground water quality standards). The next time that Regulation #61 is revised, the Commission intends that the word “ground water” will be inserted before the word “standard” in the first line of 61.12(a).

**C. Antidegradation**

The Commission refined one aspect of the Use Protected designation provisions of section 31.8. The period 2000-2009 was inserted in the considerations for designating a water as Use Protected (see 31.8(2)(b)(i)(C)); i.e., a waterbody would need to have been effluent dependent or effluent dominated during the period 2000 - 2009. The purpose of this change is to avoid a situation where, over time, more and more waters become effluent dominated and therefore use-protected without the protection of antidegradation review regarding proposed new or increased water quality impacts.

The Commission declined to adopt the Division proposal to modify the definition of “Effluent Dominated”. The Commission chose to retain the “eight out of ten” years required instead of changing it to “six out of ten” years.

**D. Dissolved Oxygen in Lakes**

The Commission clarified the application of dissolved oxygen criteria in lakes and reservoirs in footnote 9 of Table 1 in 31.16. The Commission determined that standards for dissolved oxygen apply as minima against which an individual profile will be assessed. Therefore, dissolved oxygen data collected from multiple locations in a single lake or reservoir on the same date will be assessed independently, and not averaged together.

Recreation: For the recreation use classification, the dissolved oxygen standard should apply to the upper portion of a lake or reservoir, which is typically where primary contact occurs. The dissolved oxygen standard within a single profile will generally be assessed as the average of all measurements from 0.5 meter to 2.0 meters, or to the bottom, whichever is less. Dissolved oxygen standards may be applied to deeper portions of a lake or reservoir on a site-specific basis if there is evidence that primary contact occurs in deeper portions of a lake or reservoir.

Agriculture: For the agriculture use classification, the dissolved oxygen standard should apply to the upper portion of a lake or reservoir, which is typically where livestock drink, and/or where water is diverted for irrigation. The dissolved oxygen standard within a single profile will generally be assessed as the

average of all measurements from 0.5 meter to 2.0 meters, or to the bottom, whichever is less. Dissolved oxygen standards may be applied to deeper portions of a lake or reservoir on a site-specific basis if there is evidence that water for livestock or irrigation is drawn from deeper portions of a lake or reservoir.

Aquatic Life: For the aquatic life use classification, the numeric dissolved oxygen standards should apply to the upper portion of a lake or reservoir. The dissolved oxygen in the upper portion of a lake or reservoir will generally be characterized within a single profile as follows:

1. Where a lake or reservoir is equal to or greater than 5 meters deep, the dissolved oxygen within a single profile will generally be 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, the dissolved oxygen within a single profile will generally be 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, the dissolved oxygen within a single profile will generally be assessed as the median of all measurements.

The Commission decided that dissolved oxygen may be less than the applicable standard in the lower portion of a lake or reservoir except where footnote 5(c)(iii) applies or a site-specific standard has been adopted. The Commission expects that the need for a site-specific standard will be determined at a standards hearing. Interested parties should work together to develop site-specific standard proposals that will protect species expected to occur based on sound scientific rationale and evidence.

Fall Turnover Exclusion: The Commission created additional flexibility with respect to the dissolved oxygen standard during fall turnover when oxygen-depleted bottom water may be mixed throughout a lake or reservoir. The fall turnover exclusion allows the dissolved oxygen to drop one milligram per liter below the table value standard for up to 7 days during fall turnover. However, a dissolved oxygen profile must be measured 7 days before and again 7 days after the profile with low dissolved oxygen is measured at a consistent location to ensure that the depressed oxygen condition does not persist for more than the allowed 7-day period. The Commission recognizes that fish grow more slowly when oxygen levels are slightly depressed, but also recognizes that low dissolved oxygen during fall turnover is a natural phenomenon, and that fish and other aquatic species can withstand this event without long-term negative consequences. Lakes with fish species that spawn in the fall do not qualify for the fall turnover exclusion since eggs and larvae are more sensitive to the negative effects of low dissolved oxygen. An exception to this is allowed if data show that adequate dissolved oxygen is maintained in all spawning areas for the duration of fall turnover.

Water Supply: The Commission left the existing Footnote 9 in place for the water supply use classification, but expects to consider revisions of the numeric criterion of 3.0 mg/l, and its application to lakes and reservoirs at the next basic standards rulemaking hearing in 2016.

**E. Temperature Criteria**

The Commission reformatted the temperature criteria in 31.16 Table 1, and updated the values based on new data included in the Colorado Temperature Database. The Commission also deleted the razorback sucker tier (warm stream tier III), and included the razorback sucker in warm stream tier II because the expected range of the razorback sucker is also habitat for the more thermally sensitive white sucker. Since the temperature tier applied to a segment is based on the most thermally sensitive species, the razorback sucker tier was never applied. However, this action does not preclude the adoption of a site-specific temperature standard based on the expected occurrence of the razorback sucker.

Several corrections were made to the temperature criteria. Both the Arctic grayling and golden shiner were moved from stream tiers to the cold and warm lake tiers respectively because both species are

found only in lakes. Additionally, a typographical error in the chronic temperature criterion for cold stream tier II, and large lakes and reservoirs was corrected.

The Commission also adopted a provision in footnote 5(c)(iv) of Table 1 to exclude certain exceedances of the temperature criteria in the shoulder-seasons from being considered an impairment of the aquatic life use. The footnote excludes exceedances of the winter temperature criteria in cold streams for 30 days before the transition from winter to summer, and 30 days after the transition from summer to winter provided that the natural seasonal progression of temperature is maintained. The Commission adopted this exclusion to account for year-to-year variation in the timing of the natural seasonal fluctuation of temperature. The Commission does not intend for this footnote to change the underlying table value during the winter shoulder season. The Commission did not apply this exclusion to lakes or warm-water streams because there was no evidence that spring and fall temperature fluctuations occur naturally outside of the regulatory “summer” season in these systems. The Commission believes that this issue should be reevaluated as more data becomes available.

The Commission also changed the air temperature exclusion in footnote 5(c)(i), so that sites must exceed the monthly maximum air temperature instead of the annual maximum air temperature. This change makes it possible to exclude data from any extraordinarily warm day for any time of year, and not just in summer when the maximum annual temperature occurs.

The Commission also clarified the definition of “maximum weekly average temperature” in 31.5 by deleting the word “daily” and adding the word “summertime”.

**F. *E. coli* averaging period**

The Commission adopted an averaging period of two months for the existing *E. coli* standards in Footnote 7 to Table 1. Without an averaging period, assessments have masked seasonal trends in *E. coli* at impairment concentrations. An averaging period of two months was selected to closely approximate the duration of the eight-week epidemiological studies, which are the basis for the table value criteria. Site-specific or seasonal standards will be assessed with intervals as close as possible to two months.

**G. Point of Water Supply Intake-Implementation**

The Commission clarified how the domestic water supply standards for arsenic and nitrate would be implemented in permits by expanding on the Table II footnote 4 (nitrate) and Table III footnote 14 (arsenic). These two standards apply at the point of water supply intake. In order to provide a consistent level of protection and simplify implementation in the CDPS permitting process, the default assumption will be that the standard is applied at the end of the applicable regulatory mixing zone. This presumption can be overcome if the permittee provides information demonstrating 1) that there is no actual domestic water supply use; or 2) that the standard will not be exceeded at the point of intake

**H. Metals Tables Values**

<u>Aluminum:</u> With regard to aluminum, information was presented at the hearing indicating that the total recoverable aluminum water quality standard of 750 µg/L acute and 87 µg/L chronic, including the relevant footnote, should be revised. The technical basis for the existing aluminum standards was the 1988 United States Environmental Protection Agency (“EPA”) Aluminum Document subsequent to which additional relevant data and information has become available. The revisions to the acute and chronic aluminum standards used the EPA criteria derivation and recalculation procedures. The revisions also considered the results from more recent studies such as the Arid West Water Quality Research Project (2006), which analyzed potential updates to aluminum standards based on more complete literature reviews. The Arid West work was primarily based on an overall evaluation of the EPA recalculation procedure for Arid West effluent-dependent water users and provided information that was unavailable when the 1988 Aluminum Document was prepared. Specifically, the Arid West recalculation procedure analysis discovered an inverse aluminum toxicity and hardness relationship. A hardness-based aluminum

standard is more representative of the concentration levels that harm aquatic life and so provides a better measurement of potential toxicity. The total recoverable aluminum acute criteria range from 512 µg/L to 10,071 µg/L at hardness concentrations of 25 mg/L and 220 mg/L, respectively. Following discussions with the Parties, the Commission has adopted a modified version of the original chronic criteria proposal to reflect certain species' chronic sensitivity, specifically Daphnia magna. Using the modified criteria equation, the total recoverable aluminum chronic criteria range from 73 µg/L to 1,438 µg/L at hardness concentrations of 25 mg/L to 220 mg/L. Given the available data, it was recommended that the upper bound of hardness calculations be 220 mg/L, rather than the standard 400 mg/L for other metals equations. In addition, it was noted by the Commission that some evidence indicates that rainbow trout may exhibit increased sensitivity to aluminum within the upper range of the pH standard. The Commission intends to revisit the standard if new data and information become available indicating that the current standard is not protective of rainbow trout.

Iron: The Commission declined to adopt the proposal submitted by the Colorado Mining Association. The evidence did not support the assertion that the proposed dissolved iron criterion would be protective of aquatic life.

Mercury: The Commission deleted the acute mercury table value of 1.4, and the chronic mercury table value of 0.77. These values were based on toxicological studies that included water as the sole pathway of exposure. The remaining table value for aquatic life is based on toxicological studies that included both water and food as pathways for mercury exposure. The food pathway is particularly important for mercury since it is bioaccumulative, and biomagnifies up the food chain.

Molybdenum: The Commission adopted total recoverable molybdenum table-values for the drinking water supply and agriculture use classifications. The molybdenum criterion of 210 ug/l for water supply is based on an RfD-like value that the Institute of Medicine derived from the Fungwe et. al. (1990) study and was calculated in accordance with Policy 96-2. The Commission urges the Division to review this standard and consider EPA's expected health reference level and the work underway in Europe.

The molybdenum criterion of 300 ug/l for agriculture is intended to protect livestock from the effects of molybdenosis. The agriculture table value assumes that the safe copper:molybdenum ratio is 4:1. Total copper and molybdenum intakes are calculated from the following equations:

Cu intake mg/day = [([Cu] forage, mg/kg) x (forage intake, kg/day)] + [([Cu] water, mg/l) x (water intake, L/day)] + (Cu supplementation, mg/day)

Mo intake mg/day = [([Mo] forage, mg/kg) x (forage intake, kg/day)] + [([Mo] water, mg/l) x (water intake, L/day)] + (Mo supplementation, mg/day)

The assumed values for these equations are as follows:

[Cu] forage = 7 mg/kg, [Mo] forage = 0.5 mg/kg, forage intake = 6.8 kg/day, [Cu] water = 0.008 mg/L, [Mo] water = 0.375 mg/L, water intake = 54.6 L/day, Cu supplementation = 48 mg/day, Mo supplementation = 0 mg/day.

Food and water intake is based on a 273 kg (600 lb) feeder steer consuming 6.8 kg/day of dry matter and 20% of its body weight in water per day. Site-specific water intake rates should be based on estimates of actual water consumption rates based on maximum air temperatures rather than need since cattle typically consume more water than strictly necessary. In general, assumptions about copper, molybdenum, and sulfur exposure for the purpose of deriving site-specific molybdenum standards should reflect current or potential exposure levels that are reasonable for the area, including dietary supplements. When calculating site-specific standards, copper supplementation should be as low as possible and not higher than 400 mg/day.

Uranium: The Commission revised the table value for uranium to be a hyphenated value. The Commission retained the 30 µg/L value, the maximum contaminant level (MCL) from EPA's 2000 radionuclides rule, and added a value of 16.8 µg/L. The 16.8 µg/L value is derived from use of the reference dose and relative source contribution from the 2000 radionuclides rule in Equation 1-1 of Policy 96-2. This equation and the resulting value are based purely upon the protection of human-health and do not take treatment or economic considerations into account as does the MCL. Footnote 13 to Table III will be applied to the revised uranium table value. The human-health value of16.8 µg/L is based upon protection against the chemical toxicity effects of uranium. The Commission also added footnote 17 to reference 31.11(2) which establishes the need to maintain radioactive materials at the lowest practical level.

Zinc: Since the 2005 Regulation No. 31 Basic Standards Hearing, the zinc criteria have undergone an additional technical review and update as part of the Arid West Water Quality Research Project. These revisions involved extensive literature searches and evaluation of a considerable amount of usable data for the acute and chronic zinc toxicity databases. Using these latest updates to the acute and chronic zinc toxicity databases, the zinc criteria equations were updated.

Zinc (sculpin): The Commission added a chronic zinc equation for sculpin with modifications based upon new data and information available since adoption of the equation in 2005 (31.44). Although the equation was not captured in Table III of Regulation 31 at that time, it has been adopted and applied in some of the basin regulations, Regulations 33, 34, 35, & 37. The equation applies where mottled sculpin are expected to occur and hardness is less than 102 ppm $CaCO_3$. It does not apply where mottled sculpin are expected to occur if the hardness is greater than 102 ppm $CaCO_3$. Footnote 15 was added to Table III to clarify the Commission's intent for application.

The equation is based upon data and information characterizing the chronic toxicity of zinc to Colorado sculpin as zinc varies with hardness. Chronic data from sculpin outside of Colorado were not used because their toxicity exhibits a different relationship with hardness. The equation is a linear regression of chronic toxicity values and hardness.

## I. Nonylphenol

The Commission declined to adopt the proposal submitted by the Wastewater Utility Council that the effective date of the nonylphenol standard be delayed until January 1, 2017, because the standard is not in dispute and is needed to protect aquatic life. However, the Commission recognizes the concerns about implementation of the standard expressed by several dischargers. These concerns relate to the potential difficulty of testing, measuring and controlling nonylphenol and its precursors. The Commission is retaining the effective date of January 1, 2011, based on its understanding that the normal permitting process would be followed. Effluent limits would not normally be imposed during the initial round of permit renewals, but monitoring would be required as a first step.

## J. Other Changes

The Commission added clarification to a number of items and corrected minor typographical errors:

- The definition of "chronic standard" (at 31.5(7)) was revised to remove the reference to unionized ammonia.

- The definition of "existing quality" (at 31.5(20)) was revised to reference total ammonia instead of unionized ammonia and to clarify the time period used for determining existing quality for temperature.

- The subsection on ambient quality-based standards (at 31.7(1)(b)(ii)) was revised. The reference to the 85th percentile was changed to "existing quality" which is defined at 31.5(20) and includes the 85th percentile for dissolved metals, the 50th percentile for total recoverable metals and the

appropriate statistics for pH, DO and temperature. The sentence regarding ambient temperature standards was deleted because it is covered in the definition of "existing quality." Acute standards for parameters in Tables I and II will be handled on a case-by-case basis.

- A solid line was added at the end of the footnotes to the Basic Standards for Organic Chemicals in subsection 31.11(3) to distinguish the end of the footnotes from the beginning of subsection 31.11(4)

- Punctuation was corrected in subsection 31.14 (16).

- A reference was added at subsection 31.16(3)(O).

- In Table I, the typographical error for the dissolved oxygen table value for warm water aquatic life was corrected to reflect the correct value of 5.0 mg/l. The coldwater values of 6.0 mg/l and 7.0 mg/l (spawning) had been incorrectly copied into the warm water column.

- For clarification, "1-day" was deleted from Footnote 1 to Table I.

- Language describing the transition from fecal coliforms to E. coli was deleted from Footnote 7 to Table I because this transition is complete.

- A reference to Footnote 9 was added to Footnote 1 to Table I.

- Footnote 8 to Table I was deleted because it is not used.

- The Table III column heading "Drinking Water Supply" was changed to "Domestic Water Supply" to match the name of the classification at subsection 31.1.3(1)(d).

- A missing parenthesis was replaced in the cadmium aquatic life chronic equation in Table III.

- Table IV was reformatted, the acute and chronic zinc values were updated to reflect changes adopted in this hearing, a row was added for chronic zinc numbers for the protection of mottled sculpin and the acute cadmium value at hardness 400 was corrected.

PARTIES TO THE RULEMAKING

1. Colorado Wastewater Utility Council
2. Colorado Mining Association
3. City of Grand Junction
4. South Platte Coalition for Urban River Evaluation
5. Colorado Division of Wildlife
6. City of Boulder
7. City of Westminster
8. City of Colorado Springs and Colorado Springs Utilities
9. Littleton/Englewood Wastewater Treatment Plant
10. Metro Wastewater Reclamation District
11. Denver Water
12. Northern Colorado Water Conservancy District
13. City of Black Hawk and Black Hawk/Central City Sanitation District
14. Suncor Energy (U.S.A.)
15. Bill Thiebaut, District Attorney for the 10 th Judicial District
16. Western Colorado Water Network (San Juan Citizens' Alliance, High Country Citizens' Alliance, Colorado Environmental Coalition, Colorado Trout Unlimited)
17. Cherry Creek Basin Water Quality Authority
18. Colorado River Water Conservation District

19. U.S. Energy Corp. and Mount Emmons Moly Corp.
20. Climax Molybdenum Company
21. City of Pueblo
22. Tri-State Generation and Transmission Association
23. Xcel Energy
24. Paint Brush Hills Metropolitan District
25. Pueblo West Metropolitan District
26. Colorado Stone, Sand and Gravel Association
27. Northwest Colorado Council of Governments
28. Southeastern Colorado Water Conservancy District
29. U.S. Environmental Protection Agency
30. Lori Brusnwig
31. City of Aurora
32. Farmers Reservoir and Irrigation Company
33. U.S. Department of Energy, Office of Legacy Management
34. Board of Water Works of Pueblo, Colorado
35. Rocky Mountain Environmental Labor Coalition

## 31.49 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 13, 2011 RULEMAKING; EFFECTIVE DATE JANUARY 1, 2012

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

The Commission's decision to delay consideration of nutrient criteria nine months until March 2012 resulted in revisions to the Division's and Commission's long range work schedule. Because the delay also will affect development of discharger specific variance guidance, the Commission extended the effective date of the variance provisions at 31.7(4) nine months to October 1, 2013. The Commission also extended the repeal date of subsection C of 31.7(3)(a)(ii), nine months to October 1, 2013, This subsection C describes a condition for granting a temporary modification: significant uncertainty regarding the timing of implementing attainable source controls or treatment. Because it is expected that this type of uncertainty will be addressed through the discharger-specific variance provisions, subsection C is scheduled to be repealed on the date the discharger-specific variance provisions become effective.

## 31.50 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; MARCH 12, 2012 RULEMAKING, FINAL ACTION JUNE 11, 2012, EFFECTIVE DATE SEPTEMBER 30, 2012

The provisions of sections 25-8-202, 25-8-401; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

### I. Overview

In this rulemaking hearing, the Commission has taken two major actions as part of a coordinated strategy to address current and potential future nutrient pollution of Colorado surface waters.

First, the Commission has adopted a new section 31.17 in the Basic Standards and Methodologies for Surface Water, Regulation #31, to address nutrients. Section 31.17 establishes interim numerical values for phosphorus, nitrogen and chlorophyll *a* that are deemed to be

suitable for the protection of identified categories and subcategories of classified uses of Colorado surface waters. The adoption of the interim phosphorus, nitrogen and chlorophyll *a* values in section 31.17 is the culmination of a decade-long effort, involving hundreds of hours of staff time and numerous work group meetings with dozens of stakeholders. As discussed further below, these interim numerical values identify levels that the currently available scientific information indicates would be protective of the corresponding categories of beneficial uses. However, in this proceeding the Commission is not determining for which specific waters it may be necessary and appropriate to adopt standards based on these interim numerical values.

Second, the Commission has adopted a new Nutrients Management Control Regulation, Regulation #85. This new control regulation establishes numerical effluent limitations for domestic wastewater treatment plants and other wastewater dischargers that use active treatment and are likely to have significant levels of nutrients in their discharges. It also describes steps to be taken by other point source dischargers and nonpoint sources to address nutrients.

Finally, it establishes monitoring requirements for point source dischargers and a program aimed at monitoring surface waters for nutrients and related parameters. This effort is geared towards better characterizing nutrient sources, and current nutrient conditions, to help inform future regulatory decisions regarding nutrients.

The Commission has determined that the adoption of the requirements set forth in Regulation #85 are necessary to protect the public health, beneficial uses of Colorado waters, and the environment of the state, based on sound scientific and technical evidence in the record. As part of the overall nutrients management strategy described here, the Commission has decided to depart from its usual practice of adopting numerical table values in Regulation #31 and then, in subsequent hearings to review individual basin standards, broadly applying those values as segment-specific water quality standards throughout the State. Rather, the Commission believes that nutrient control in Colorado will proceed faster and more expeditiously by focusing the primary control efforts over the next decade on the technology-based approach described below and set forth in a new Nutrients Management Control Regulation. However, section 31.17 includes provisions that identify limited circumstances where the interim numerical values being established may be applied in the adoption of segment specific water quality standards during the next ten years. No new or revised water quality standards are established by this current rulemaking action. It is the Commission's determination that this approach will achieve the maximum practical degree of water quality in the waters of the state consistent with the welfare of the state, and that this approach maximizes the beneficial uses of water while bearing a reasonable relationship to the economic, environmental, energy, and public health costs and impacts to the public.

The Commission has decided that this two-part strategy for addressing nutrients is the best current policy option to make effective progress in addressing nutrients management in Colorado at this time. The Commission believes that to rely on the usual standards-based approach alone (table value criteria, followed by segment-specific water quality standards, along with possible temporary modifications and discharger-specific variances, and then incorporation into discharge permits with compliance schedules) would result in substantially less progress in controlling nutrients in the next several years than will the technology-based approach set forth in new Regulation #85. At the same time, the Commission has retained the ability to use the new interim nutrient values established in Regulation #31 as the basis for the adoption of segment-specific water quality standards in appropriate, but limited, circumstances. Although it will inevitably take a significant number of years for existing wastewater dischargers to accomplish the planning, financing and construction of facilities to meet the new Regulation #85 effluent limitations, that implementation of nutrient controls is likely to be considerably more expeditious than that which would result from the delays and transaction costs associated with the traditional standards-based control efforts alone. Moreover, following the initial ten years of implementation of the provisions now being established the Commission will determine whether additional, more

extensive standards adoption is necessary to address nutrient control needs that are not fully addressed by the technology-based requirements now being established.

## II. Direct Use Water Supply Use Sub-classification and Application of Discretionary Value

The Commission has adopted a new subsection 31.13(1)(d)(i) to create the Direct Use Water Supply Lakes and Reservoirs (DUWS) sub-classification of the domestic water supply use. This sub-classification will be applied to specific water bodies in certain narrowly-defined situations, as elaborated below. Colorado already broadly applied standards that provide significant protection for the water supply use. This new sub-classification supplements the existing protections of the water supply use by providing this Commission and future Commissions with the opportunity to adopt additional protection where it is needed in order to protect the use. For simplicity “lakes and reservoirs” hereinafter are referred to as “lakes”.

The intent of this sub-classification is to recognize special cases involving different vulnerabilities and risks that may not apply to all lakes covered under the broader water supply use classification. For the DUWS lakes, water flows (or is pumped) directly to the water treatment facility, where it is treated and then distributed to the service population for consumption; these water supplies are used directly. With the DUWS sub-classification, the Commission also preserves the ability to apply additional protection to lakes where convincing evidence has been presented that the lake will become a direct use water supply in the future.

### A. Adoption of the Sub-classification

The use is intended for lakes that are used regularly to deliver surface water directly to a drinking water treatment plant that treats and disinfects raw water. The term “plant” is interpreted broadly to include, in addition to any treatment facilities, any associated conduit, forebay, mixing basin or storage feature for the waters that have been withdrawn for use or treatment. In special circumstances it may also be appropriate to assign the use to a lake, with or without an intake, for which a showing has been made that the lake will be a DUWS in the future.

In establishing the sub-classification for Direct Use Water Supply (DUWS) the Commission intended that this sub-classification apply to, and protect, waters in lakes and reservoirs that are regularly used sources of drinking water supply. Testimony was presented that during droughts, during construction of water storage, conveyance and treatment systems, and during emergencies, municipal water suppliers may use temporarily a water treatment plant intake within a lake or reservoir. It is not intended that such infrequent use of plant intakes should trigger a designation of such a lake or reservoir as a Direct Use Water Supply.

### B. Discretionary Application of DUWS Value as Segment-Specific Standard

The decision about the need to apply a specific value to protect the DUWS use will be made on a site-by-site basis, based on consideration of the factors set forth in subsection 31.17(e)(ii). The Commission may rely on a number of factors to determine whether a numerical chlorophyll standard (either the value in table 31.17(d) or a scientifically appropriate alternative) is appropriate to provide additional protection for DUWS lakes. One factor to be considered is whether the public water system using the lake as a raw water supply has experienced impacts that may be attributed to algae on an intermittent or persistent basis. Such impacts could include potential problems with disinfection by-products, taste-and-odor, or algal toxins.

Another factor is whether there are existing restrictions on use of the lake that recognize its importance as a water supply. The existence of use restrictions, such as prohibitions

against swimming or boating, may signify that the community already made a special commitment to the value of source water protection.

A third factor is whether application of this standard appropriately balances protection of all classified uses of the lake. The Commission recognizes that the DUWS use may not be the sole use for which the lake is classified. For example, there is potential for competition between interests, like fishing, that benefit from higher algal abundance and DUWS that benefits from lower abundance. It is important to note, however, that the Commission's charge is to protect the individual uses, not "optimize" them. A balance must be found that prevents impairment of any of the uses with the consideration for the public policy ramifications of promoting one use over another. These balancing decisions will be made on a site-specific basis taking into account factors such as the holistic cost of preventing eutrophication versus the holistic costs of increased drinking water treatment.

And finally, in order to preserve the Commission's discretion in adopting standards, the decision may take into account any other site-specific considerations which affect the need for, or advisability of, a more protective value.

## III. Nutrient Interim Values

The Commission has adopted a new section 31.17 in the Basic Standards and Methodologies for Surface Water, Regulation #31, to address nutrients. Section 31.17 establishes interim numerical values for phosphorus, nitrogen and chlorophyll *a* that are deemed to be protective of identified categories and subcategories of classified uses of Colorado surface waters. However, as noted elsewhere, the Commission is not determining in this proceeding that it is necessary or appropriate to adopt these numerical values as water quality standards for any specific water bodies. The Commission has labeled these values "interim" to emphasize its intent to undertake further review of the evolving science regarding nutrients before applying numerical nutrient standards broadly to surface waters throughout Colorado. These values will be subject to review in subsequent triennial reviews.

### A. Development of Nutrient Values to Protect the Direct Use Water Supply

The Commission adopted a chlorophyll *a* value of 5.0 ug/L to protect human health in DUWS lakes. The value is an average of samples taken from March through November. The duration of March through November was selected as a surrogate for an annual average. An average would be consistent with assessment of the relevant drinking water standards, but not all months can be sampled safely in every year (ice cover and access are problematic in the winter). In the context of ongoing triennial reviews, the Commission intends to review the scientific rationale related to the selection of a numerical value for DUWS set forth in Table 3. As discussed in Section II.B, above, the Commission further reiterates its intent to rely on a number of factors to determine whether a numerical chlorophyll standard (either the value in Table 31.17(d) or a scientifically appropriate alternative) is appropriate to provide additional protection to a DUWS lake.

Improved protection of human health is achieved indirectly because, although chlorophyll itself is not toxic, algae produce the organic matter that can form disinfection by-products (DBPs). DBPs are formed when disinfectants used in water treatment plants react with natural organic matter present in the source water. Different disinfectants produce different types or amounts of DBPs.

Since 1974, when it was discovered that disinfection produces DBPs from naturally occurring organic matter, numerous toxicological studies (studies on the health effects from exposure to high dosages contaminants usually involving animals in a lab) have shown several DBPs to be carcinogenic in laboratory animals. Some DBPs have also

been shown to cause adverse reproductive or developmental effects in laboratory animals. As a result of these and other findings, EPA included DBP controls in its Stage 1 Disinfectants/Disinfection Byproducts Rule (1998). The Colorado Primary Drinking Water Regulations (5CCR 1003-1, table 2-5) include the maximum contaminant levels for DBPs. In addition, section 31.11 of the Basic Standards for Surface Water contains a water supply standard for total trihalomethanes (total THMs) of 80ug/L. THMs are one of the classes of DBPs.

All lakes contain natural organic matter, which is the precursor for DBP formation. Algae contribute to this pool of natural organic matter, but are rarely the sole contribution. Natural organic matter also comes from external (i.e., watershed) sources. Nevertheless, the contribution from algae is significant in two ways – it is more difficult to treat and more easily controlled than natural organic matter from external sources.

The DUWS value was developed based on the relationship between THMs and dissolved organic carbon (DOC) produced by algae. The chemical properties of algal-derived DOC differ from the properties of DOC from the watershed. These properties are very important because they explain why algal-derived DOC is not amenable to removal with standard treatment of drinking water.

Generally, the amount of algal-derived DOC is proportional to the abundance of algae, which is measured as the chlorophyll concentration. Setting a limit on the amount of chlorophyll controls the production of algal-derived DOC and limits one source of precursors for the creation of cancer-causing compounds during water treatment.

The Commission adopted a numerical value of 5 ug/L for the average chlorophyll *a* concentration in DUWS lakes with the intent of controlling algal contributions to the formation of THMs. Evidence was presented that, based on the reactivity of algal-derived DOC (ug/THM per mg/DOC), a target threshold of 80 ug/L for the THM (i.e. the MCL) results in a threshold of 3 mg/L algal derived DOC. The threshold concentration of algal-derived DOC was linked to algal abundance using a ratio of DOC to chlorophyll from lakes in which DOC is predominantly from algae. The Commission has chosen the 10th percentile ratio of DOC to chlorophyll *a* of 0.6 mg/ug as a matter of policy because some small portion of algal DOC may be removed in standard treatment and because other factors in the drinking water facility also may influence the formation of DBPs.

B. Development of Interim Nutrient Values to Protect Recreational Uses in Rivers and Streams

The Commission adopted a value of 150 mg chlorophyll *a* / $m^2$ for the abundance of benthic periphyton (attached algae) for protection of the recreational use in rivers and streams. The benthic algae value is based on results from several published studies. Public opinion surveys conducted by Montana Department of Environmental Quality (DEQ) showed that recreation was “desirable” in streams where benthic algae levels were at or below 150 mg/$m^2$ . Recreation was “undesirable” where the level was at or above 200 mg/$m^2$ . The Montana study is consistent with other reports in the literature suggesting that 150 mg chlorophyll *a* / $m^2$ represents a “nuisance threshold.” The value will be implemented as a summertime maximum consistent with its foundation in a study of public responses to “snapshot” observations. The allowable exceedance frequency is set at once in five years, as a matter of policy, based on the historical use of a five year data period for evaluation in the context of the 303(d) list. The Commission recognizes that attainment of standards based on this value can be assessed only where a representative sample can be obtained with the Division’s sampling protocol, which is designed for hard substrate.

C. Development of Interim Nutrient Values to Protect Aquatic Life in Rivers and Streams

In section 31.17, the Commission adopted interim numerical values for total nitrogen (TN) and total phosphorus (TP) concentrations in Colorado's rivers and streams. The interim values represent annual median concentrations with an allowable exceedance frequency of once in five years.

In this action, the Commission relied upon quantitative bioassessment of Colorado's surface waters using tools endorsed in Commission Policy 10-1 "Aquatic Life Use Attainment: Methodology to Determine Use Attainment for Rivers and Streams" (see Policy 10-1, section VIII). Colorado's Multimetric Index (MMI) was used (along with the total taxa metric) to measure the "health" of the macroinvertebrate community. The scientific literature demonstrates the mechanisms which link nutrients to the health of the macroinvertebrate community. Total phosphorus and total nitrogen concentration data from Colorado streams along with the bioassessments were used to derive the numeric thresholds in three steps – characterization of unimpacted conditions (anchor point location), definition of the stressor-response relationship, and threshold setting.

Anchor Point: Evidence was presented that characterized nutrient concentrations and the condition of the macroinvertebrate community at unimpacted warm and cold aquatic life sites in Colorado. At these sites and in the surrounding watersheds, there has been little or no human activity, and nutrient concentrations are low. The macroinvertebrate communities at these sites are in good condition and are relatively insensitive to changes in nutrient concentrations within the unimpacted range. Separately for cold and warm streams, the *anchor point condition* was chosen as the 85th percentile of the TN or TP for those sites. The median MMI (or total taxa) defines typical biological condition in unimpacted sites. The 85th percentile of the TN and TP concentration was used as the *anchor point nutrient level* since that statistic commonly has been used in Colorado to characterize the existing ambient condition.

Stressor-Response Relationship: Evidence submitted in this hearing showed that nutrients cause a decline in biological condition. The slope and confidence intervals of this response was estimated with a statistical tool called quantile regression. The slope of the 90th quantile provided the optimum characterization of the response, although slopes were similar for adjacent quantiles. The same procedure was applied separately for MMI and total taxa. For the stressor-response relationship, median nutrient concentrations were calculated for sites with at least five observations. Similar results are found in the scientific literature in evaluating the significance of the effects of total nitrogen on the macroinvertebrate community.

Threshold Setting: In deciding on the appropriate nutrient thresholds, the Commission reaffirmed the policy decision that criteria should be set at levels that allow minimal negative effect yet still protect the use. A 5% decrease in biological condition is considered a minimal negative effect; the value is taken by analogy from the precedent for toxics, where 95% of the genera are protected from toxic effects and 5% are not protected. In the context of setting nutrient criteria, the Commission decided as a matter of policy, that a 5% decline in the metrics that reflect the health of the aquatic community as a whole would be an allowable decline that would still provide protection of the aquatic life use.

The actual threshold values for TN and TP were derived separately for cold and warm streams in three steps based on evidence submitted in this hearing. First, the allowable decline in biological condition was calculated (it is a 5% decrease in MMI or total taxa from the anchor point condition median of the reference sites). Second, the allowable increase in nutrient concentration from the anchor point nutrient level was calculated by using the slope from the stressor-response relationship to solve for nutrient concentration that equates to the 5% allowable decline in the anchor point condition. Resulting

threshold concentrations from the MMI analysis and the total taxa analysis were averaged to produce the interim values for TN and TP shown in the table.

In addition to the primary information used to calculate thresholds, the Commission considered supporting information that included comparison with published and calculated estimate of background concentrations, numeric thresholds in the scientific literature, biological metrics in the scientific literature, and thresholds developed by other states.

D. Development of Interim Nutrient Values for Lakes and Reservoirs

The Commission adopted interim numerical chlorophyll *a*, total nitrogen and total phosphorus values in 31.17 for Colorado's lakes. The values represent summer average concentrations (requiring at least three observations in the months July through September of the same year). The allowable exceedence frequency is once in five years. These numerical values would be applied to lakes that are greater than 25 acres in size and have a residence time of at least fourteen days. For lakes smaller than or equal to 25 acres, a narrative standard would be applied. Lakes with a residence time of less than fourteen days would be assessed against stream standards.

The interim values adopted by the Commission support target trophic conditions for cold and warm lakes that have been defined first in terms of algal abundance. Target trophic conditions represent the long term productivity goals that balance the potentially competing interests while minimizing the risks of water quality problems such as elevated pH. However, the Commission also recognizes that there is potential for competition between interests, like fishing, that might benefit from higher algal abundance and those, like swimming or aesthetic enjoyment, that might benefit from lower algal abundance.

The Commission selected the target trophic conditions as a matter of policy, relying in part on the existing regulatory definitions and expectations for cold and warm aquatic life. Cold lakes normally can support salmonids, and warm lakes normally can support warm water gamefish. Optimal trophic conditions for a trout fishery are mesotrophic, whereas optimal conditions for a warm water fishery are eutrophic. In both cases, the Commission specified an upper bound for productivity as a means of protecting healthy fisheries, but the Commission does not encourage or support nutrient enrichment for less productive lakes.

The Commission selected mesotrophic as the target trophic condition for cold lakes because it is supportive of trout fisheries without competing with recreational or aesthetic interests, and it is not expected to result in water quality problems (such as elevated pH). Based on evidence submitted in the hearing, a mesotrophic condition is not exceeded if the summertime average chlorophyll *a* concentration does not exceed 8 ug/L. Lakes that exceed 8 ug/L have become more productive than the target trophic condition. This level is consistent with criteria developed by other states for lakes expected to support trout fisheries.

The Commission selected eutrophic as the target trophic condition for warm lakes because it is supportive of a warm water fishery, and is respectful of clarity preferences for recreation and aesthetics. Information submitted in the hearing, however, indicated that when chlorophyll *a* concentrations approach the upper boundary of the eutrophic range (25 ug chlorophyll a/L), the risk of pH exceedances increases. Accordingly, in order to reduce the risk of water quality problems due to elevated pH, the numerical value for chlorophyll *a* was reduced to 20 ug/L. Warm water lakes in which the summer average chlorophyll concentration exceeds 20 ug/L have become more productive than the target trophic condition. The values for warm lakes in Colorado are similar to those proposed by other states for "cool water" fisheries.

Interim numerical values for TP and TN were also adopted by the Commission. The nutrient values serve as indicators of a potential for excessive productivity rather than a means of guaranteeing a particular chlorophyll concentration. The nutrient values were selected based on evidence from Colorado lakes that relates the nutrient concentrations to algal abundance. Empirical relationships between nutrients and chlorophyll were used to characterize typical conditions for each target trophic condition, and empirical mean-variance relationships were used to define exceedance thresholds for each constituent.

The Commission believes that the numerical values for chlorophyll *a* , phosphorus, and nitrogen provide a robust basis for determining when the target trophic condition is being exceeded. The values are not intended, however, as a means of guaranteeing that all other related water quality measures, like pH and dissolved oxygen (DO), will meet standards. These related measures are influenced by processes in addition to algal productivity, and they are assessed separately. Thus, they serve the additional purpose of indicating where the underlying problems are not related solely to nutrients.

## IV. Use of Interim Nutrient Values

### A. Limitation on Use

The interim nutrient values for phosphorus and chlorophyll *a* adopted in this regulation will not be used for the adoption of water quality standards for specific water bodies in Colorado prior to May 31, 2022, except as described below.

During the initial period of implementation, the interim nutrient values for phosphorus and chlorophyll *a* will be used for the adoption of water quality standards for waters located in headwaters areas above all permitted domestic wastewater facilities discharging prior to May 31, 2012, or with preliminary effluent limitations requested prior to May 31, 2012, regardless of whether they are subject to effluent limits in Regulation #85, and any non-domestic facility subject to Regulation # 85 effluent limits and discharging prior to May 31, 2012. These values may also be used to adopt standards for protected water supply lakes and reservoirs. The regulation also reserves the right for the Commission to make a policy determination to use the interim nutrient values to adopt standards in circumstances where the Commission has determined that the technology based requirements in the Control Regulation will not provide adequate protection of a classified use.

The Commission adopted 31.17(h) to clarify that both before and after May 31, 2022, the Commission may consider the adoption of site-specific standards and established the factors to take into consideration.

The interim nutrient values for nitrogen will not be used for the adoption of water quality standards for any specific water bodies in Colorado prior to May 31, 2017. From May 31, 2017 to May 31, 2022, these nitrogen values will be used for the adoption of water quality standards for specific water bodies only in the limited circumstances described below. The Commission has adopted a later effective date for the nitrogen numerical values as a policy choice, taking into account (1) concerns about the potential cost of treatment to meet stringent nitrogen values, (2) the fact that Regulation #85 will result in substantial nitrogen control, along with phosphorus control, over the next several years, and (3) the desirability of providing another triennial review cycle to assess any additional scientific developments regarding appropriate numerical criteria for nitrogen prior to using these numerical values to adopt enforceable standards.

The interim nutrient values are not intended to nor shall they be construed to affect effluent limitations resulting from existing TMDLs or Control Regulations developed for nutrient control. Where TMDLs are developed to address impairment of water quality

standards for other parameters and it is determined that nutrients are a contributing factor, these values may be used in the development of the TMDL.

Following May 31, 2022, the numerical nutrient values adopted by the Commission may be used for the adoption of water quality standards for any surface waters in Colorado. At that time, the Commission will review the progress made in nutrients management under the regulatory provisions adopted in this proceeding and will assess where the adoption of additional water quality standards may be needed for the protection of the quality of Colorado waters as clarified in section 31.17(g).

The Commission expects that during the 2022-2025 basin reviews, in developing its proposal, the Division will carefully consider where adoption of additional numeric standards is necessary to protect uses. Entities interested in site-specific numeric standards are encouraged to develop their proposals in advance of the 2022-2025 basin reviews so that all appropriate information is available to help inform the decision making.

B. Waters Above Dischargers

Because Colorado's high quality headwaters streams are an important natural resource, the Commission has adopted provisions allowing for adoption during the next round of basin standards reviews of numerical water quality standards for phosphorus and chlorophyll *a* for waters above dischargers regardless of whether they are subject to effluent limits in Regulation #85. Adoption of standards in these areas will not impose any costs on existing dischargers, but will help assure protection of a valuable Colorado resource in the face of potential future development.

C. Direct Use Water Supply Lakes and Reservoirs

As elaborated above, the decision about whether a specific criterion is necessary to protect the DUWS will be made on a site-by-site basis. It is currently the Commission's intent to initially apply the chlorophyll *a* value without a translation to total nitrogen or total phosphorus criteria. It would be inappropriate to apply the general TN and TP translators since those are based on an assessment of the linkage between maintaining a specific trophic state and a summer average chlorophyll level. The DUWS value is based on avoiding exceedance of a threshold.

In the case where the water quality in a DUWS with a chlorophyll *a* standard exceeds its promulgated standard, then the Commission intends that, through the TMDL process, the translators can be developed to tie site-specific lake and water management characteristics to necessary in-lake and contributing watershed values for total nitrogen and/or total phosphorus.

D. Other Circumstances

The Commission and the Division are not currently aware of any circumstances where adoption of numerical nutrient standards for Colorado surface waters during the next round of basin reviews is necessary, except the two categories of circumstances described above. The Commission has adopted subsection 31.17(e)(iii) to preserve its options if circumstances should arise in which the Commission determines that such standards are necessary in view of unique site-specific conditions.

## V. Antidegradation

The Commission decided that no new antidegradation provisions specific to nutrients are necessary at this time. Rather, the Commission intends that its existing general practice for

addressing antidegradation will apply with respect to nutrients. As noted above, the Commission intends to consider the adoption of site-specific standards for high quality waters above existing dischargers. In addition, in the separate control regulation being approved today, the Commission is establishing more stringent effluent limitations for new dischargers, to help minimize new impacts on Colorado water quality.

## VI. Assessment and Section 303(d) Implementation

The Commission does not intend that the interim numerical nutrient values set forth in sections 31.17(b), (c) and (d) will be used directly as a basis for identifying impaired waters to include on Colorado's Section 303(d) List. In the limited circumstances where these numeric values are used prior to 2022 as the basis for adopting site-specific numerical water quality standards, as described in sections 31.17(e) and (f), those adopted numerical standards would be used as the basis for listing decisions.

The Commission agrees with input suggesting that it is important to address how Colorado will implement the current narratives standards, as they may apply to nutrients, in making section 303(d) listing decisions. The Commission requests that the Division address this issue in development of the Section 303(d) Listing Methodology for the 2014 listing cycle. The Commission intends that listing decisions based on the narrative standards would be based on a "weight of the evidence" approach. In the absence of applicable numerical water quality standards, it is appropriate to look at all relevant considerations in making a determination about attainment of uses and compliance with the narrative standards.

In the event that a water body is determined to be impaired due to nutrient enrichment based on interpretation of the nutrient narrative standards prior to May 31, 2022, a related standard such as DO or pH is not attained, or an investigation of an aquatic life use impairment shows that the cause is nutrient enrichment, the Commission envisions the following process would be followed:

1) Where the impaired segment is the receiving water or downstream of permitted discharges that are subject to controls in Regulation #85, then

   a. Where a Category 4b demonstration plan documenting implementation of nutrient controls to comply with Regulation #85 is submitted and such plan is accepted by the Division and EPA in accordance with the Section 303(d) Listing Methodology, the segment will not be included on the 303(d) List;

   b. Where a Category 4b demonstration plan is not submitted or is not accepted in accordance with the Section 303(d) Listing Methodology, and the segment is included on the 303(d) List, the segment would receive a low priority for TMDL development until the Regulation #85 source controls are fully implemented, and the water body water quality reflects any resultant improvement.

2) Where the impairment is not downstream of permitted discharges that are subject to controls in Regulation #85, or if the water body remains impaired due to nutrients after implementation of Regulation #85, the Division will develop a TMDL that will determine what site-specific numeric nutrient values are appropriate to protect the applicable uses. The Division will propose to use those values as site-specific standards for the water body. The Commission intends that the TMDL process explore all available alternatives in an effort to avoid the potential imposition of requirements more stringent than the Regulation #85 controls on facilities not subject to controls in Regulation #85.

3) Where the Commission has adopted site-specific numeric standards, water-quality based effluent limits will be developed for the dischargers that have a reasonable potential to

cause or contribute to an exceedance of those standards. (Compliance schedules and discharger-specific variances will be available according to the policies governing each.)

4) Where the impairment is upstream of permitted discharges that are subject to controls in Regulation #85, TMDL development will be designated a higher priority for the water body.

**VII. Discharge Permits**

In order to provide direction to the Division in the case that a new facility is sited in a location where the Commission has adopted numeric nutrient standards, or where a discharger seeks to demonstrate applicability of an exception to the technology-based effluent limits at 85.5(3)(b)(i), the Commission revised section 31.9 Flow Considerations to include critical low flows for nutrients. The existing text of subsection 31.9(1) was reformatted into further subsection and a new provision was added that established critical flow conditions for nutrient standards (TN and TP). Since nutrients are not toxic, it is not appropriate to use the 30E3 chronic low flow (used for toxic parameters) in calculating permit limits. Nutrient values in section 31.17 were developed from analysis of annual median concentrations because the aquatic community integrates the effects of nutrients over time. To be consistent with existing low flow criteria, the duration of the low flow exception should match the duration of the criteria, which is 365 days for nutrient criteria. Therefore, the Commission adopted provision 31.9(1)(c) that establishes the critical low flow for TN and TP effluent limits as an annual median low flow with an average 1-in-5 year recurrence interval, which can be calculated from the second driest year in a ten year period. Water quality based effluent limits derived using this critical low flow will apply year round.

The Commission does not intend that the interim numerical values adopted in section 31.17 would be used as the basis for implementing Colorado's narrative water quality standards, set forth in section 31.11, in discharge permits. Rather, as elaborated in the statement of basis and purpose for Regulation #85 that is being adopted in this rulemaking, the Commission intends that the requirements of that regulation, including the numerical effluent limitations for process wastewater dischargers, constitute a reasonable and appropriate first step in the implementation of Colorado's narrative standards as they relate to nutrients. Therefore, compliance with Regulation #85 will be deemed to be compliance with the narrative standards unless and until the Commission adopts subsequent revisions to Regulation #85 and/or Regulation #31.

PARTIES TO THE RULEMAKING

1. Conservation Groups
2. Colorado Nutrient Coalition
3. Colorado Water Utility Council
4. Colorado Wastewater Utility Council
5. Colorado Stormwater Council
6. Colorado Association of Home Builders
7. Associated General Contractors of Colorado
8. Colorado Association of Commerce & Industry
9 Colorado Agricultural Producers Alliance
10. Colorado Lake and Reservoir Management Association
11. Colorado Division of Parks and Wildlife
12. Eagle River Water and Sanitation District
13. Northwest Colorado Council of Governments
14. Colorado River Water Conservation District
15. 5-2-1 Drainage Authority
16. Mesa County
17. Grand Valley Drainage District
18. City of Grand Junction
19. Town of Rangely

20. Town of Nucla
21. Clifton Sanitation District
22. Southwestern Water Conservation District
23. Monument Sanitation District
24. Donala Water & Sanitation District
25. Buena Vista Sanitation District
26. Cherokee Metropolitan District
27. Fountain Sanitation District
28. Lower Fountain Metropolitan Sewage Disposal District
29. Security Sanitation District
30. Palmer Lake Sanitation District
31. Pikes Peak Area Council of Governments
32. City of Colorado Springs and Colorado Springs Utilities
33. Tri-Lakes Wastewater Treatment Facility
34. Pueblo West Metropolitan District
35. City of Westminster
36. Board of Water Works of Pueblo, Colorado
37. Centennial Water & Sanitation District
38. City of Boulder
39. City and County of Broomfield
40. City of Fort Collins
41. City of Pueblo
42. Miller Coors, LLC
43. Plum Creek Wastewater Authority
44. Tri-State Generation & Transmission Association
45. Upper Blue River Sanitation District
46. Xcel Energy
47. Upper Clear Creek Watershed Association
48. Northern Colorado Water Conservancy District
49. Metro Wastewater Reclamation District
50. South Platte Coalition for Urban River Evaluation
51. City of Black Hawk and Black Hawk/Central City Sanitation District
52. City of Arvada
53. Grand County Districts
54. North Front Range Water Quality Planning Association
55. Bear Creek Watershed Association
56. Littleton/Englewood Wastewater Treatment Plant
57. City of Lafayette
58. Niwot Sanitation District
59. Board of County Commissioners of Weld County
60. Parker Water and Sanitation District
61. Chatfield Watershed Authority
62. Dominion Water and Sanitation District
63. City and County of Denver
64. City of Thornton
65. City of Aurora
66. Farmers Reservoir and Irrigation Company
67. City of Northglenn
68. Denver Water
69. City of Brush
70. Academy Water and Sanitation District
71. Woodmoor Water & Sanitation District No. 1
72. Towns of Hotchkiss, Olathe, Ridgway and Silverton
73. Town of De Beque
74. Orchard Mesa Sanitation District
75. Colorado Association of Conservation Districts

76. Denver Metro Chamber of Commerce
77. Town of Estes Park
78. Pagosa Area Water and Sanitation District
79. City of Greeley
80. Central Colorado Water Conservancy District
81. Arapahoe County Water and Wastewater Authority
82. Colorado Department of Transportation
83. Colorado Municipal League
84. Cherry Creek Basin Water Quality Authority
85. Roaring Fork Water & Sanitation District
86. Southeastern Colorado Water Conservancy District
87. U.S. Environmental Protection Agency
88. Water Quality Specialists
89. Upper Thompson Sanitation District
90. City of Fort Lupton

## 31.51 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; AUGUST 13, 2012 RULEMAKING; FINAL ACTION SEPTEMBER 11, 2012; EFFECTIVE DATE JANUARY 31, 2013

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

A. Basic Standards for Organic Chemicals

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 31.11(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to section 41.5(C)(3) were considered during the same hearing that addressed changes to the statewide surface water organic chemical standards in Regulation No. 31 (Basic Standards and Methodologies for Surface Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy, the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 41.5(C)(3) indicated that the water quality standards for acrylamide, carbon tetrachloride, 1,4-dioxane, hexachloroethane, nitrobenzene, pentachlorophenol, tetrachloroethylene (PCE), and 1,1,1-trichloroethane, needed to be revised. This review also identified new compounds in the IRIS data that the Commission elected to adopt as water quality standards, these were: acetone, bromobenzene, chlordecone, 1,2-dibromoethane, dichloromethane, ethylene glycol monobutyl ether (EGBE) (2-Butoxyethanol), 2-hexanone, perchlorate, 2,3,7,8-tetrachlorodibenzo-p-dioxin, trichloroacetic acid, 1,2,3-trichloropropane. The compounds acylamide, dichloromethane, and 1,2,3-trichloropropane are mutagenic compounds, and the resulting Water Supply standards were calculated following EPA guidance on calculating water supply standards for mutagenic compounds. The Commission also corrected several typographical errors and added common synonyms for some of the organic chemicals.

The Commission heard testimony from several parties asserting that the revised standard adopted for 1,4 dioxane may not be attainable with economical treatment technologies and in some instances may be difficult to measure using current laboratory analytical techniques. Such technical and economic issues are often addressed by EPA in establishing a Maximum Contaminant Level (MCL) under the Safe Drinking Water Act, and the Commission has in the past established a range for a particular chemical, with the health-based standard being the minimum and the MCL the maximum, since EPA has

determined that MCLs represent an acceptable level to provide in public drinking water. However, no MCL has been developed for 1,4 dioxane. The Commission therefore did not adopt a range and instead set the statewide standard for 1,4 dioxane at a level to protect human health, based on the currently available scientific information and applying the Commission's established risk-based policy approach. The Commission believes that the concerns raised are better addressed with respect to site-specific implementation issues and notes that there may be a need for site-specific standards for 1,4-dioxane and other regulated organic chemicals to address site-specific economic and/or technical treatment capabilities. The Division concurred with the parties' testimony regarding these concerns and expressed willingness to work with parties who propose site-specific solutions to the Commission.

PARTIES TO THE RULEMAKING

1. Climax Molybdenum Company
2. Metro Wastewater Reclamation District
3. Lowry Environmental Protection/Cleanup Trust Fund
4. South Adams County Water and Sanitation District
5. Brown Group Retail, Inc.
6. International Risk Group, LLC
7. Environmental Protection Agency
8. City of Boulder

## 31.52 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; APRIL 11, 2016 RULEMAKING; FINAL ACTION MAY 9, 2016; EFFECTIVE DATE JUNE 30, 2016

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

A. Basic Standards for Organic Chemicals

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 31.11(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to section 41.5(C)(3) were considered during the same hearing that addressed changes to the statewide surface water organic chemical standards in Regulation No. 31 (Basic Standards and Methodologies for Surface Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy, the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 41.5(C)(3) indicated that the water quality standard for tetrachloroethylene (TCE), needed to be revised. EPA expressed concerns regarding the proposed hybrid standard approach for TCE. In light of the impact that a decision on the hybrid standard for TCE may have on other hybrid standards adopted by the WQCC, and because the human health risk of maintaining the current standard of 5 mg/L is not an order of magnitude above the risk for a standard of .76 mg/L, the Commission decided to not modify the TCE standard at this hearing. The Commission expects the broader issue of hybrid standards will be discussed with EPA and the stakeholders, and that the issue may be revisited at a future hearing. The IRIS review also identified new compounds in the IRIS data that the Commission elected to adopt as water quality standards, these were: biphenyl, methanol, and tetrahydrofuran.

PARTIES TO THE RULEMAKING

1. Environmental Protection Agency

## 31.53 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 13-15, 2016 RULEMAKING; FINAL ACTION AUGUST 8, 2016; EFFECTIVE DATE DECEMBER 31, 2016

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE**

In this rulemaking the Commission considered revisions to criteria and revisions to implementation methodologies. The Commission adopted changes as detailed below.

### I. TEMPERATURE

In 2007, the Commission adopted temperature criteria and implementation methods for Colorado's surface waters. The criteria were derived from laboratory-based studies of individual fish species' tolerance to elevated water temperatures. The implementation methods were developed based on review of other states' methods and adaptation of methods for implementation of other water quality standards. Since that time, the Division and stakeholders have gained a great deal of experience with empirical records showing spatial and temporal patterns of temperature in surface water and effluent. Experience has shown that the adopted standards often are not attainable due to natural environmental constraints that are closely tied to elevation and may be affected by other factors as well. Consequently, revisions may be needed to incorporate those natural constraints that are an appropriate incremental improvement to the current standards. The revisions discussed in this rulemaking build on a decade of practical experience gained from massive data collection efforts and they chart a path forward to improve the basis for the standards, incorporate the effects of elevation on attainability and ensure more consistent implementation.

There are four parts to the temperature standards that were discussed in this hearing. The first, Part A, is a change to the definition of existing quality to clarify the implementation of exceedance frequency. The second, Part B, revises criteria to incorporate new information about the temperature tolerances of fish. Part C provides policy direction to address consideration of temperature standards at elevations below which the physiologically-based temperature standards are not attained routinely. Part D provides policy direction to address consideration of temperature standards in the shoulder seasons.

### A. Definition of Existing Quality

The Commission restructured the definition of existing quality (EQ) at 31.5(20) and modified the portion about temperature to allow one warming event above standards with a 3 year average exceedance frequency. EQ is a characteristic of the ambient condition that is used in two contexts: 1) comparing the ambient condition to water quality standards to determine whether standards are attained; and 2) characterizing the upstream water quality for calculating permit effluent limits. It has also been used when setting ambient standards. Changes were made to clarify the definition of EQ for temperature so that it can be consistently applied in each programmatic context.

The revised definition specifies that the value for EQ is the maximum DM and MWAT which allows for one warming event with a 3-year average exceedance frequency. The Commission recognizes the potential for natural systems to occasionally exceed numeric standards and that limited exceedances of the standard are expected. The Commission's intent is that thermal conditions should be sufficient for longer lived fish species to complete their lifecycles, and evidence derived from the literature suggests that 3 years is sufficient for most stream fish in Colorado. Additionally, the Commission recognizes that autocorrelation is inherent in stream temperatures, and that several days exceeding the standard may be the result of a single warming event. For standards attainment, the Commission intends that the average recurrence frequency of these warming events be limited to once every 3 years. (Table 1, footnotes 5a

and 5b were edited to reflect this.) Therefore, where data records are 3 years or less, EQ will be the maximum DM or MWAT. For data records of 4 to 6 years, an allowance will be made for one warming event in either the summer or winter. For data records of 7 to 9 years two warming events are allowed. The definition of a "warming event" will be determined with statistically appropriate tests and representative data defined in the next 303(d) listing methodology process. In addition to consideration of the frequency of "warming events", the Commission would like the Division to look at the impacts of duration, multiplicity and cumulative effects.

For permitting, the Commission intends that EQ will also incorporate an allowable exceedance frequency for monthly determination. EQ will be the maximum DM or WAT with 3 or less years of representative upstream data. For data records with 4-6 years, the second highest monthly DM or WAT may be selected for one month in either winter or summer and the remaining months shall be the max DM or WAT. Allowances for each month are not appropriate because the allowable exceedance frequency (the recurrence interval) is based on the time that it takes for the aquatic community to recover from a harmful event.

The Commission retained the temperature excursions at 31.16 Table 1 – Footnote 5(c) so they could be addressed along with shoulder seasons and transition zones in a future rulemaking.

The requirement for "adequate refuge" has been awkwardly split between the temperature footnote (5(c)) and the dissolved oxygen footnote (9(c)). Footnote 5(d)(iii), the allowance for temperature exceedances in lakes where adequate dissolved oxygen is present below the mixed layer (the refuge allowance), was deleted. To maintain the requirement but simplify the regulation, in footnote 9(c), the reference to footnote 5(c)(iii) has been replaced by a clear statement that adequate refuge is required and a description of adequate refuge.

**B. Temperature Criteria**

Temperature Database Updates: As part of the Division's routine review, the Colorado Temperature Database was updated using the most recent literature regarding the thermal requirements of Colorado's fishes. This effort was an initial step to support revision of the warm water winter acute values (discussed below) and also allowed for general updates of cold and warm water acute and chronic values. New acute and/or chronic thermal tolerance information was found for several species, both cold and warm water, including brook trout, brown trout, cutthroat trout, lake trout, mountain whitefish, rainbow trout, black crappie, bonytail, channel catfish, largemouth bass, mountain sucker, and stonecat. Based on this information, the Commission adopted revisions to the existing temperature standards found in Table I.

A new critical thermal maxima value for lake trout was added to the database as part of the updates. This new acute value, combined with existing chronic data, allowed for the derivation of DM and MWAT values for lake trout. Including lake trout in the Cold Lakes & Reservoirs and Cold Large Lakes & Reservoirs DM and MWAT calculations would result in MWAT values of 16.7°C for both tiers. Lake trout are currently managed in only 30 individual lakes/reservoirs, which are in a total of 17 segments; these segments comprise less than 9% of all lakes segments. Due to the relatively small number of segments containing lake trout, the Commission decided to not include the lake trout data in the derivation of statewide lakes/reservoirs temperature standards. Instead, the Commission adopted a footnote to Table I stating that where lake trout do occur and protection from thermal impacts is necessary and appropriate, the literature-based summer MWAT and DM for lake trout of 16.6°C and 22.4°C, respectively, should be applied. The Commission intends for these lake trout populations to be covered by the "adequate refuge" provision that requires concurrent attainment of the literature-based summer MWAT and DM values and dissolved oxygen standards.

A similar approach was taken for mountain whitefish. Early life stages of this species are known to be more thermally sensitive than other CS-I and CS-II species and adult mountain whitefish are known to migrate into cold tributaries to spawn. To ensure protection of sensitive early life stages, the Commission adopted a footnote to Table I stating that where and when spawning and sensitive life stages of mountain

whitefish are known to occur, the literature-based summer MWAT and DM of 16.9°C and 21.2°C, respectively, should be applied.

Warm Water Winter Acute Table Values: When seasonal temperature standards were adopted in 2007, warm water winter acute and chronic standards were simply set at half the summer season values, recognizing a pattern seen in cold waters. The acute winter table values for warm water fish were revised based on lethal temperature thresholds established in laboratory experiments for fish acclimated to "winter" temperatures. This new method protects warm water fish in winter from acute effects. The Commission adopted the resulting warm tier temperature winter standards in Table I.

## C. Additional Flexibility in Transition Zones

The physiologically-based summer temperature standards are not attainable in every year in every segment where they have been adopted. The attainability problem is not tied to specific watersheds or isolated locations, but is instead a statewide phenomenon that shows a clear spatial pattern related to elevation and could be affected by other factors. The problem arises from an unavoidable conflict between the historical distributions of fish species and the expectation that protective conditions for all life history stages can be sustained in every year throughout a segment. The environment varies naturally and fish move in response to environmental stimuli.

Temperature tiers have been adopted on the basis of the best available information concerning the fish species that have been found in the segment. The assignment of temperature tiers is logical and defensible, but an implementation problem arises if the assignment is accompanied automatically by the assumption that temperature standards are always attainable throughout the segment.

Water temperature in unimpacted streams is primarily governed by physical factors (e.g., solar radiation) that affect heat gain and loss, for which elevation is a practical surrogate. Current evidence shows that because of this natural phenomenon, maximum temperatures are expected to exceed the physiologically-based standards in some years at lower elevations for some temperature tiers.

The Division proposed a statewide elevation adjustment for the summer MWAT (the MWATelev) to define a modified expectation for maximum temperatures. The elevation range where the adjustment was proposed to be applied is called the transition zone. Several parties at the hearing disputed the sufficiency of the data presented by the Division, the extent to which anthropogenic influences were assessed and the validity of the Division's regression analysis. The Commission declined to adopt this approach in favor of a basin-by-basin consideration of attainability issues. This adjustment informs, but does not change, the narrative standard which requires maintenance of a normal pattern of increase and decrease in water temperature. The basin-by-basin approach will allow consideration of ambient -quality–based site-specific standards proposals in accordance with section 31.7(1) where elevation is the natural, irreversible factor. Unlike the basis for most other ambient-standards proposal, elevation occurs everywhere and has a predictable effect on water temperature. The basin-by-basin approach will provide an opportunity to consider this elevation adjustment as one of multiple lines of evidence and more specifically the basin hearings will provide for consideration of site-specific contravening evidence. The Commission intends for the experiences of this approach to inform potential changes to the Basic Standards in the future. However, the Commission does not intend that this approach is a de facto adoption of statewide standards through segment specific changes.

At this time, the Commission has not considered the same adjustment to the Daily Maxima temperature standards. Such an adjustment could be considered on a site-specific basis and future analysis may identify the same statewide attainability issues that can be addressed in future rulemaking.

Lakes

Temperature standards for lakes apply to the upper, mixed layer where water temperatures are governed by physical factors (e.g., solar radiation). Elevation may prove to be a useful surrogate for the suite of

physical factors driving temperature in lakes. The Division presented evidence based on 574 lake-years of data from 116 lakes sampled over a broad range of elevations during the last 20 years. To be included in this analysis, a lake had to have been sampled during a 6-week period in mid-summer (11 July to 21 August) when maximum temperatures (MWAT) are expected. Several lakes showed evidence of anthropogenic influence in the form of “tailwater” effects from upstream reservoirs (e.g., Morrow Point) or very short retention times (e.g., Estes); these were excluded.

Regression analysis was used to define the relationship between summer MWAT and elevation. Lines for individual years were compared to assess interannual variability, which was small for the slope. The exceedance frequency was addressed by developing a regression line for the 66.7th percentile MWAT at each of the 33 lakes with at least 5 years of qualifying data. Elevation explains more than 90% of the variability in MWATs for the lakes analyzed in this hearing.

MWATelev = -0.001651 (elevation) + 32.43

At the time of the next routine review of each basin, the MWAT adjustment could be considered for lakes where the MWATelev is predicted to exceed the adopted standard. For example, the MWAT adopted for Cold Large Lakes currently is 18.3 oC, and the equation predicts that it is not routinely attainable in lakes at elevations below about 8560 ft and warm lakes below 3774 ft. This is consistent with the elevations of lakes for which site-specific temperature standards have already been adopted.

Streams

Like lakes, water temperatures in streams are governed by physical factors and elevation may be a useful surrogate for these factors. The Division presented evidence from analysis of water temperature records from 267 sites in Colorado over a broad range of elevations and throughout Colorado’s varied landscape. Data from approximately 1162 site-years was used to examine the relationship between summer maximum temperatures and elevation. All sites were screened for likely anthropogenic influences from waste water treatment facilities and reservoirs (tailwaters). Of 10 different physical and geographic watershed and site attributes, site elevation most strongly predicts annual MWATs for the analyzed sites. Additionally, residuals (unexplained variance) from the relationship between each year’s MWAT and elevation were analyzed to determine whether the remaining variance was related to the following attributes: slope, aspect, Strahler stream order, percent canopy cover, 30-year max air temperature, CHILI Index (an index of solar radiation, slope, latitude and aspect), watershed area, upstream active diversions count, and sum of absolute and conditional diversion rates. Regression analysis between the summer MWAT and elevation showed that over 80 percent of the variance is explained by elevation alone. Annual variability was examined by comparing the relationships for individual years; slopes were in close agreement. The exceedance frequency was addressed by developing a regression line for the 66.7th percentile MWAT at each of the 79 sites with at least 5 years of data. This value is an interpolated estimate of the once in three year exceedance value of existing quality. The resultant equation is:

MWATelev = -0.002145 (elevation) + 32.97

At the time of the next routine review of each basin, the MWAT adjustment could be considered for sites in the transition zone along with other lines of evidence. For example, for a site in a Cold Stream Tier II segment at 6800 feet elevation, the MWATelev of 18.5oC could be the operative standard instead of the 18.3oC standard for the segment.

**D. Additional Flexibility in Shoulder Seasons**

For each temperature tier, there are summer and winter criteria, and the shift from one season to the next occurs abruptly on a single date. The rigid, first-of the-month changeover of seasons does not reflect the natural pattern of gradual, predictable change in temperature, nor does it provide flexibility to allow for inter-annual variability in the timing and rate of temperature change. These two factors reflect the natural

constraints on temporal patterns of water temperature in streams and lakes, partially as a function of elevation.

The Division proposed to revise the table values for each stream and lake temperature tier to substitute the existing narrative standard for the months on either side of the transitional date (i.e., the shoulder seasons). Support for applying the narrative standard was provided by the elevation-related trend in the duration of winter (i.e., consecutive days below the adopted winter standard) and the natural variability documented for the fall and spring transition dates at individual sites. The Commission declined to adopt this approach, in favor of a basin-by-basin consideration of these issues. The Commission intends for the experiences of this approach to inform potential changes to the Basic Standards in the future. However, the Commission does not intend that this approach is a de facto adoption of statewide standards through segment specific changes.

One approach that could be considered in hearings at the basin level is revising the segment-specific standards so the numeric criteria would apply only for the core winter and summer months. The narrative standard would continue to require a normal pattern with no abrupt changes.

Attainment of the narrative standard during the fall and spring could then be assessed for 303(d) purposes by determining the direction of the general temperature trend, using the average WAT of each month. If the surface water is cooling or warming at the appropriate season, then it would not result in an exceedance of the narrative temperature standard.

For the purposes of implementation in permits, the intent would be to ensure that the natural seasonal progression is maintained. For each of the months in the shoulder seasons, simple linear interpolation could be used to establish a value for the water quality standards that could be used in the mass balance equation for setting permit limits.

## II. OTHER CRITERIA

### A. Methylmercury (human health)

To protect human health, the Commission adopted a methylmercury fish tissue basic standard at new subsection 31.11(7) and revised Footnote 6 to Table III (Metal Parameters) at 31.16. This water quality criterion of 0.3 milligrams (mg) methylmercury per kilogram (kg) fish tissue wet weight describes the concentration of methylmercury that protects consumers of fish and shellfish among the general population. The criterion is consistent with EPA's section 304(a) water quality criterion for methylmercury. This new standard applies to all waters of the state because fish migrate and contribute to food webs that integrate large geographic areas; therefore, it is not sufficiently protective to apply the standard only in locations where fish are expected to be caught and consumed.

Adoption of this threshold as a standard in Regulation #31 recognizes the Commission's practice in the context of Regulation #93 (Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation Lists). The Commission has made listing decisions using an average fish tissue criterion of 0.3 mg/kg as a numeric threshold for determining attainment of the aquatic life use.

Adoption of the 0.3 mg/kg methylmercury criterion does not represent a policy change. The current water column standard of 0.01 µg/L total mercury remains in place and is intended to be implemented alongside the fish tissue standard. The Commission expects that in some circumstances, site-specific water column standards may be developed where data are available.

### B. Arsenic (water supply)

After the 2010 rulemaking hearing, EPA disapproved a modification of Footnote 14 to Table III (Metal Parameters) which applies to arsenic. This footnote stated that the arsenic effluent limits would be calculated so that the arsenic concentration at the point of intake to the domestic water supply would not

exceed the standard. EPA disapproved this concept because standards must protect the designated use, whether or not the use is an "actual" use. In today's action the Commission deleted Footnote 14 and renumbered the remaining footnotes and deleted the reference to Footnote 14 in Table III. The Commission found that in the majority of segments, the footnote has no effect. Most segments have a water+fish standard for arsenic that is more stringent than the water supply standard.

### C. Nitrate (water supply)

After the 2010 rulemaking hearing, EPA disapproved a modification of Footnote 4 to Table II (Inorganic Parameters) which applies to nitrate. As in the arsenic footnote described above, this footnote stated that the combined total of nitrate plus nitrite at the point of intake to a domestic water supply would not exceed 10 mg/L. EPA disapproved this concept because standards must protect the designated use whether or not the use is an "actual" use. In today's action the Commission repealed Footnote 4 with a delayed effective date of December 31, 2022. A delayed date allows time for stakeholders to bring forward site-specific proposals for use removal and/or resegmentation in the next round of basin hearings, and also time to obtain permit modifications before the footnote repeal date.

### D. Acute Chlorine for Class 2 Waters

The Commission adopted an acute chlorine standard of 0.019 mg/L for Class 2 waters to protect aquatic life. In 2005, the chronic chlorine standard of 0.011 mg/L was adopted for Class 2 waters, and it is unclear why an acute standard was not also adopted at that time. Because chlorine is a fast-acting toxicant, both acute and chronic chlorine standards are necessary to protect the aquatic life use.

## III. ANTIDEGRADATION PROVISIONS

### A. Baseline Date for Significance Determination

The Commission adopted revisions to 31.8(3)(c) to clarify the procedures for segments where the antidegradation designation changed from Use Protected to undesignated (i.e. Reviewable) after the previously established baseline date of September 30, 2000. The revision added the phrase "or the effective date when the Use Protected designation is removed." At the same time, subsection 31.8 (3)(c)(ii)(B) was split into two sections for ease of application.

### B. Temporary Impacts in Outstanding Waters

The Commission revised the regulatory language to clarify that short-term degradation associated with certain types of activities is consistent with the Outstanding Waters designation. The Commission does not intend this to change policy or procedures regarding determining the meaning of waters being "maintained and protected at their existing quality."

Examples of activities that result in long-term ecological or water-quality benefit include, among others: use of rotenone or other pesticides to remove invasive species; construction of fish barriers to prevent the spread of non-native species; construction of bridges at stream crossing to minimize damage to the stream and improve water quality; or construction of aquatic habitat improvement.

A determination that activities will result in only "short-term" degradation will occur as part of a permitting or 401 certification action by the Division. It is difficult to give an exact definition of "short-term" because of the variety of activities that might be considered. However, in broad terms, "short-term" should be weeks and months, not years. In some cases, projects may need to extend over multiple work seasons, but in all cases the impacts of a project over time must be considered. The Commission expects that in those actions the Division will ensure that conditions are imposed as necessary and appropriate to ensure that degradation occurs for the shortest amount of time possible.

Examples of "clear public interest" activities shall only be those that address public health, welfare and safety which could include in some cases: construction of public roads for the purpose of public safety, maintenance of public roads, bridges and roadways, including shoulder weed control; control of mosquitoes or other disease vectors; enhancement of significant historical and archaeological resources; and suppression of wildfires or fire pre-suppression or restoration activities.

### C. Antidegradation: Iron, Manganese, and Sulfate (water supply)

The Commission revised section 31.8(1)(b) and added two new subsections (i) and (ii) to exempt dissolved iron, dissolved manganese, and sulfate from antidegradation consideration. Federal requirements for antidegradation protection only extend to assimilative capacity for criteria that protect CWA § 101(a)(2) uses (commonly known as "fishable/swimmable"). Dissolved iron and manganese and sulfate do not fall in those categories; rather they are water supply standards which originated as secondary Safe Drinking Water Act criteria. The Colorado framework treats these secondary water supply parameters differently.

The criteria for iron, manganese and sulfate remain in place, unchanged, to protect the water supply use. These criteria do not act as surrogates for any criteria that would protect a fishable/swimmable use (e.g., chloride acts as a surrogate for an aquatic life criterion). This exemption does not negate the requirement for an antidegradation review in regards to standards that protect other classified uses.

### D. Default Use Protected Designation for Effluent-dependent/Effluent-dominated Waters

After the 2010 rulemaking hearing, EPA disapproved a modification of section 31.8(2) (b)(i)(c) which allows the Commission to designate a waterbody as Use Protected if the waterbody was effluent-dominated or effluent-dependent during the period of 2000-2009. EPA disapproved this concept because federal policy is that antidegradation designations are to be made based on the quality of the water, not on the source of the water.

In today's action the Commission repealed section 31.8(2)(b)(i)(C) with a delayed effective date of December 31, 2019. In taking this action, the Commission considered that for all reviewable waters, affected entities have an opportunity to submit an alternatives analysis (i.e., to support decisions regarding whether allowing water quality is necessary to accommodate important economic or social development). But the Commission also acknowledges stakeholder concerns regarding uncertainty about the process and criteria for alternatives analyses. Therefore, the Commission is repealing the provision with a delayed effective date to allow the Division and interested stakeholders time to work together to review alternative analyses submittals and approvals that have been done to date, and discuss whether a new alternatives analysis guidance document should be developed, and if so, to develop guidance prior to the repeal date. The delayed effective date is also intended to allow the Division and interested stakeholders time to engage in further discussions regarding an appropriate water quality test for effluent-dependant and effluent-dominated waters. The Commission may consider a proposal to amend or replace section 31.8(2)(b)(i)(C) in a rulemaking before the repeal effective date.

### E. Alternatives Analysis – Selection of Alternative

The Commission added a sentence to section 31.8(3)(d)(iii) to better align the Basic Standards rule with the recently-revised EPA water quality standards regulation. This modification was adopted because the Colorado antidegradation rule did not explicitly address what outcome is required in situations where, as part of a necessity of degradation determination, one or more non-degrading or less degrading alternatives are identified. It now explicitly requires selection of a non-degrading or less degrading alternative. The Commission does not intend this to change current Colorado policy or procedures.

## IV. REVISION OF SECTION. 31.14 "IMPLEMENTATION IN DISCHARGE PERMITS"

Substantial changes were made to the portions of the Basic Standards that address the way the standards are implemented in discharge permits. Many provisions that were in 31.14 were deleted to reduce redundancy with other regulations (namely, Regulation #61, "Colorado Discharge Permit System Regulations") and to eliminate language that has outlived its useful life. Other provisions were moved to section 31.9, to consolidate the provisions that address implementation of standards. Section 31.10 continues to contain the provisions that address Mixing Zones.

Restructuring: The title of section 31.9 was changed from "Flow Considerations" to "Implementation of Standards." Even before today's rulemaking, the section contained provisions that went beyond flow considerations. Most of the material from section 31.14 that was deemed to be still relevant was moved to section 31.9.

Results of Review of 31.14: Section 31.14 now is blank and the section is "reserved." The history of each subsection, its origin (where known), and fate are described below:

- 31.14(1): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards. It appears to never have been used. The reasons behind the reference to Regulation #71 (the Dillon Control Regulation) are unclear. For these reasons, this section was deleted.

- 31.14(2): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards. It was deleted because it is redundant with section 61.8, and is also in the federal rules for state programs at 40 CFR § 130.3.

- 31.14(3): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards.It was deleted because it is redundant with section 61.8, and is in the federal rules at 40 CFR § 130.7.

- 31.14(4): This section pre-dates 1987 and there is no record of how or why this section was added to the Basic Standards.The portion that authorizes Compliance Schedules was moved to 31.9(2) and expanded to match the language in Regulation #61. The portion that states that effluent limits "may" be established was deleted because there was a conflict between the Regulation # 61 version ("must") and this version ("may"). The portion that describes how effluent limits shall be established was moved to Regulation #61 to replace an existing cross-reference. The statement that a rulemaking hearing can subsequently be held was moved to the statement of basis and purpose provisions of Regulation #61.

- 31.14(5): This section was added in 1988 (see 31.24.I). The "innovation" language was added to 31.3 at the same time that this provision was added to 31.14. In order to capture the concept of using innovative approaches, such as trading programs, in various water quality contexts, the language "TMDLs, Waste Load Allocations antidegradation reviews, and permits" is also being added to 31.3. Section 31.14(5) is generally redundant with the concepts in 31.3 and is also captured at 61.8(3)(r) of Regulation #61. A new section was also adopted during this rulemaking proceeding at 61.8(3)(u) to capture the "innovation" concept in the context of permits, and thus this section 31.14(5) was deleted.

- 31.14(6): There is no record of when this section was added. Section 61.8(4)(a) addresses this concept, and thus this section 31.14(6) was deleted.

- 31.14(7): This section was added in 1987 (see 31.22 C). This section is now redundant with Regulation #61, 61.8(2)(B)(vii), and thus this section 31.14(7) was deleted.

- 31.14(8): This section was added in 1988 (see 31.24 E and F). This material is covered in sections 31.7, 31.9 and 31.16, and thus this section 31.14(8) was deleted.

- 31.14(9): This section was added in 1989 (see 31.25 E). This section was deleted because practical quantification limits (PQLs) are now covered in a separate policy.

- 31.14(10): This section was added in 1989 (see 31.25 E). Section 61.8(4)(a) of Regulation #61 addresses this concept, and thus this section 31.14(10) was deleted.

- 31.14(11): This section was added in 1989 (see 31.25 E) when organic standards were added to Regulation #31. This section was deleted because this authority is already provided to the Division. It serves no purpose substantive now, and thus was deleted

- 31.14(12): This section was added in 1989 (see 31.25 E). Section 61.8(4)(a) of Regulation #61 addresses this concept, and thus this section was deleted.

- 31.14(13): This section was added in 2000. The Division is not aware of any current permits that have implemented this provision. Colorado's intake credit provisions are found at section 61.8(2)(d) of Regulation #61. It is not clear how this provision is intended to be used, and thus it was deleted.

- 31.14(14): This section was moved to 31.9.

- 31.14(15) and (16): These sections were consolidated and were moved to 31.9. The Commission made revisions to these provisions to align them with the Division's practice since 2007, as expressed in various basin regulations for implementing "current condition" temporary modifications. Specifically, the Commission added references to "existing discharges" to clarify that effluent limits based upon temporary modifications only apply to existing discharges, and that effluent limits for new and expanded discharges must generally be set to the underlying standard. Additionally, the previous reference to 31.14(4) was deleted because all compliance schedules must be issued in accordance with the provisions authorizing compliance schedules.

- 31.14(17): This section was moved to 31.9. The phrase "compliance schedule" in subsection (a) was changed to "permit condition" to allow more flexibility for permitting approaches.

## V. OTHER CHANGES TO METHODOLOGIES

### A. Site-specific Ambient-based Standards

The Commission adopted revisions to section 31.7(1)(b)(ii) that identify two types of ambient-based standards, "feasibility-based" and "natural or irreversible quality-based" standards, to recognize that in some cases water quality can be improved, but not to the level required by the table value.

Where the only sources and causes of the pollutant(s) are natural, ambient quality-based ambient standards continue to be the Commission's preference. However, where the sources and causes are to some extent anthropogenic, more clarity is needed to assure that classifications and standards are set to protect the highest water quality attainable.

The provision (the downgrading factors) that provides the authority for ambient-based standards is based on the same provisions that authorizes discharger-specific variances (DSVs) (40 CFR § 131.10(g) and 31.6(2)(b)), except that the cause is not a permitted point source, and this action would apply to the entire segment. Since it is the same regulatory foundation, it is appropriate to use the same feasibility bar for determining what improvements are appropriate. As with DSVs, this type of change to numeric standards is authorized only where a comprehensive alternatives analysis demonstrates that there are no feasible alternatives that would provide better water quality.

The Commission continues to believe that adopting ambient standards for a constituent(s) is preferable to downgrading or removing entire uses and their associated water quality standards. Adopting an ambient standard in effect creates a sub-category of the use and is a regulatory downgrade. These ambient standards protect the highest attainable use and are consistent with 31.6(1)(e), which requires that classifications should be for the highest water quality attainable. To that end, “highest attainable use” was defined and added to section 31.5.

The revisions also provide clarity regarding the analysis and documentation that is required to make the “no feasible alternatives” demonstration. The Commission encourages proponents to complete the Division’s checklist to ensure that their supporting information is adequate.

**B. Temporary Modifications set to Current Condition**

The Commission revised section 31.7(3) to incorporate a new subsection (d) that explicitly addresses the operative value that is in place during the term of a temporary modification. These changes recognize current policy and are not meant to change that policy, only to clarify and expressly approve its use. This change authorizes the use of the narrative statement “current condition” as the operative value to preserve the status quo for the discharger and the waterbody during the term of the temporary modification. The Commission indicated that if the standards database can be adjusted to accommodate it, that future proposals for temporary modifications should include in the table the date on which the temporary modification was adopted. Temporary modifications are only appropriate where a compliance problem exists, and the adoption of the temporary modifications are intended to temporarily relax the control requirements, including direct discharge permits, indirect discharge permits, and other control mechanisms such as local limits while the uncertainty regarding the underlying standards is addressed. The Commission recognizes that during the temporary modification permitted dischargers’ effluent quality may be marginally changed and that variability in effluent quality may occur. Because the status quo is to be maintained, the Commission does not intend that temporary modifications set at “current condition” apply to new or expanded discharges. Protection of existing uses means protection of the actual uses rather than protection of the full use classification. The Commission intends that the revisions to section 31.7(3) apply prospectively only, and do not retroactively change the basis for or implementation of previously adopted or extended temporary modifications set at “current conditions.”

**C. DSV Alternative Effluent Limits**

The Commission revised section 31.7(4)(b) to clarify that the Division, not the Commission, sets the alternate effluent limits of a discharger-specific variance, and that these limits are to be expressed as a temporary hybrid standard. The hybrid approach establishes a cap on the effluent limit, but does not actually set the level of the effluent limit. The Commission added three new subsections (i), (ii) and (iii) to describe the format of the hybrid standard and how it is used by the Division to set control requirements such as discharge permit effluent limitations.

Based upon the results of a comprehensive alternatives analysis, the Commission will determine specifically which alternative(s) provide the highest degree of protection of the classified use that is feasible. The alternative effluent limit establishes conditions to be met through implementation of the selected alternative(s). The Commission expects that in most cases, the alternative effluent limit will be a numeric limit. In cases where there is a high degree of uncertainty regarding the improvement or effluent concentrations that will be achieved, the Commission may adopt an alternative effluent limit as a narrative condition that identifies specific actions to be completed through implementation of the selected alternative(s).

**D. Downstream Protection**

The Commission adopted modifications at section 31.3 to more clearly identify that water quality classifications and standards must protect downstream waters. In the past, the Commission and Division have relied on section 31.6(1)(c) and Regulation #61 to provide this protection. This modification implements 40 CFR § 131.10(b) and is not intended to change Colorado’s current practice that already

considers and ensures the protection of downstream water quality during the development of designated uses and water quality standards.

## VI. HOUSEKEEPING

The Commission added clarification to a number of items and corrected minor typographical errors:

- Definition of MWAT and WAT: The definitions of Maximum Weekly Average Temperature (MWAT at 31.5(26)) and Weekly Average Temperature (WAT at 31.5(50)) were clarified. The MWAT definition was shortened and does not repeat the details that are in the WAT definition. The word “mean” was inserted in the WAT definition to clarify that the WAT is calculated from daily average temperatures. This is consistent with the current implementation methods of the Permits and Assessment. The words “multiple” and “equally spaced” in the WAT definition were removed to reflect current assessment methodology.

- 31.6(4)(b): A missing parenthesis was added to this subsection.

- 31.6(2)(b)(iv): The phrase “result in attainment or the use” was to corrected to “result in attainment of the use.”

- 31.7(3)(a)(ii)(C): This section was deleted as it describes a condition for granting a temporary modification that is addressed through the discharger-specific variance provisions, and was repealed effective 10/01/2013.

- 31.11(3): The content of Footnote 5 to the Table of Basic Standards for Organic Chemicals was deleted as unnecessary and replaced with the word “deleted.” The Commission notes that practical quantification limits are now located in a Division policy document and not in Regulation #61.

- 31.16 Table III – Footnote 3: The word “aluminum” was added to replace the chemical abbreviation, and a space was deleted.

- 31.16 Table III – Footnote 5: The word “total” was deleted from the phrase “50 µg/L total chromium” to clarify that the sum of hexavalent and trivalent chromium is not to exceed 50 µg/L. Capitalization, spacing, and symbol use was also corrected for portions of this footnote.

PARTIES TO THE RULEMAKING

1. Metro Wastewater Reclamation District
2. Colorado Parks and Wildlife
3. Environmental Protection Agency
4. Arkansas Fountain Coalition for Urban River Evaluation
5. Colorado Monitoring Framework
6. Littleton/Englewood Wastewater Treatment Plant
7. Eagle Park Reservoir Company
8. Eagle River Water and Sanitation District
9. City of Steamboat Springs
10. Upper Eagle Regional Water Authority
11. City of Colorado Springs and Colorado Springs Utilities
12. Northern Colorado Water Conservancy District
13. Southwestern Water Conservation District
14. Dolores Water Conservancy District
15. Aurora Water Department

16. South Adams County Water and Sanitation District
17. Town of Fraser
18. Trout Unlimited
19. City of Boulder
20. City of Fort Collins
21. City of Pueblo
22. Seneca Coal Company
23. Suncor Energy (U.S.A.)
24. Colorado Wastewater Utility Council
25. Climax Molybdenum Company
26. Public Service Company
27. Tri State Generation and Transmission Association, Inc.
28. Plum Creek Reclamation Authority
29. Centennial Water and Sanitation District
30. City of Black Hawk and Black Hawk/Central City Sanitation District
31. Northwest Colorado Council of Governments (NWCCOG) and NWCCOG Water Quality/Water Quantity Committee
32. Colorado Wildlife Federation
33. Rocky Mountain Chapter of the Sierra Club
34. Pueblo County
35. Towns of Hotchkiss, Olathe and Ridgway
36. North Front Range Water Quality Planning Association
37. Colorado River Water Conservation District
38. XTO Energy, Inc.
39. Parker Water and Sanitation District
40. Dominion Water and Sanitation District

## 31.54 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JANUARY 9, 2017 RULEMAKING; EFFECTIVE MARCH 1, 2017

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

A. Corrections to Organic Chemicals

In this written comment rulemaking, the Commission corrected errors to the organic chemical standards in the regulation that occurred subsequent to the April 11, 2016 rulemaking. The division proposed changes to fix errors to water+fish and fish ingestion standards for biphenyl, tetrahydrofuran, methanol and trichloroethylene (TCE), and a revision to the trichloroethylene (TCE) water supply standard. During the hearing process for the April 11, 2016 rulemaking, the division withdrew the afore mentioned additions and revisions to the Regulation 31 organic chemical standards due to concerns related to EPA's 2015 update to Human Health Ambient Water Quality Criteria. The final action documents submitted to the Secretary of State inaccurately reflected the commission's decision with respect to biphenyl, tetrahydrofuran, and methanol. At the time of notice for this hearing, there was a belief that the final action documents submitted to the Secretary of State also inaccurately reflected the commission's decision with respect to trichloroethylene (TCE). However, the official version of the regulations accurately reflects the TCE standards. Therefore, the corrections made by the commission in this rulemaking were: deletion of the water+fish and fish ingestion standards for biphenyl, tetrahydrofuran and methanol. No changes were made to the water+fish, fish ingestion and water supply standards for trichloroethylene (TCE).

## 31.55 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; OCTOBER 10, 2017 RULEMAKING; EFFECTIVE DECEMBER 30, 2017

The provisions of sections 25-8-202(1)(b), 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for adoption. The commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

**BASIS AND PURPOSE:**

Phase 2 of Colorado's Nutrients Management Program: In this rulemaking, the commission took action to put into place the second phase of Colorado's strategy to address current and potential future nutrient pollution of Colorado surface waters.

In 2012, the commission adopted interim numerical values for phosphorus, nitrogen, and chlorophyll *a* as one part of a two-part strategy. Since 2012, the commission has adopted phosphorus numeric values upstream of domestic discharges, cooling tower discharges, and non-domestic discharges subject to Regulation #85 effluent limitations in segments throughout the state in accordance with 31.17. The commission has also adopted the direct use water supply classification and standard in accordance with 31.17. In 2016, EPA approved the interim numeric values for chlorophyll *a*, approved with recommendations the numeric values for phosphorus and nitrogen for lakes and reservoirs, and took no action with respect to the interim numeric values for phosphorus and nitrogen for rivers and streams or the delayed effective dates.

In 2012, the commission envisioned that the interim numeric values in 31.17 could be used for the adoption of water quality standards for any surface waters in Colorado following May 31, 2022. However, EPA's action in 2016 has led the commission to consider modifications to its nutrients reduction strategy.

First, the commission noted that EPA had approved the interim numeric values for chlorophyll *a*, and the commission determined that the 2022 timeframe is appropriate for adoption of chlorophyll *a* standards. The adoption of chlorophyll *a* standards throughout the state in the 2022 timeframe is included in Colorado's nutrients management plan that was discussed during the proceedings for this hearing. Also discussed in that plan is the commission's anticipation that during Phase 2 of Colorado's nutrients management approach, the chlorophyll *a* standards will be implemented through the TMDL process for waters listed on the 303(d) list for impaired waters.

Second, the commission noted that EPA approved with recommendations the numeric values for phosphorus and nitrogen for lakes and reservoirs. Because of the EPA recommendations regarding the interim phosphorus and nitrogen values for lakes and reservoirs, additional analysis is needed before applying the interim values, particularly for warm-water lakes and reservoirs. The commission determined that the division should revisit the phosphorus and nitrogen values for lakes and reservoirs, and should prioritize the development of numeric phosphorus and nitrogen standards based on protection of public health. Therefore, as reflected in the nutrients management plan, the commission anticipates that in the 2022 timeframe the division will propose phosphorus and nitrogen standards for lakes and reservoirs that are direct use water supply reservoirs and where there are public swim beaches. With the exception of direct use water supply reservoirs and lakes and reservoirs with public swim beaches, the commission has decided to further delay the effective dates of the phosphorus and nitrogen numeric values below dischargers to 2027.

Third, the commission noted that EPA took no action with respect to the interim numeric values for phosphorus and nitrogen for rivers and streams. The commission determined more time is needed to revisit the numeric values for phosphorus and nitrogen for rivers and streams, and anticipates that revised standards will be developed and considered in the 2027 timeframe. The commission acknowledges that removing organic nitrogen to low levels is a current technological challenge. The commission recognizes this issue will need to be considered in future policy reviews and rulemaking hearings regarding nutrients along with future technological advances.

The commission also anticipates that a hearing will be held in 2020 to consider impacts from nonpoint sources and potential strategies for nonpoint source control. As part of implementing the provisions of Regulation 85 at subsection 85.5(5), Nonpoint Source Discharges, the commission determined that

considerable progress has been made to date by the division, the Colorado Monitoring Framework Agricultural Task Force, the Lower Arkansas Valley Water Conservancy District, and other partnering entities through dissemination of nutrient control-related information and tools for voluntary use by the agricultural community. This model of collaborative outreach, education, and engagement has been made possible through division leadership and funding to support these efforts, as well as the proactive responsiveness of entities who work directly with agricultural producers. The ccommission encouraged these collaborative activities to continue with a goal of documenting measurable results for presentation at the next triennial review.

In addition, while the commission's traditional approach would have meant that the commission would have considered updated standards for ammonia and selenium in 2021, the current intent of the commission is to delay adoption of revised standards for selenium and ammonia until 2027 as well. The long-term strategy is that the commission will consider the adoption of revised standards for all of these constituents for all water bodies in the state in rulemaking hearings in 2027. The commission anticipates that over the course of the next 10 years, the division will work to revise the standards for ammonia, selenium, nitrogen and phosphorus for rivers and streams, while at the same time will develop feasibility information to assist dischargers with proposing discharger specific variances, which will also take into consideration the treatment challenges of treating for nutrients, selenium, and ammonia, as well as temperature. In order to implement standards as soon as practical, the commission will not rely on the basin review process for adoption of site-specific standards over the course of several years. Instead, in hearings in 2027, the commission will consider site-specific standards and discharger-specific variances for all of these parameters for all waters bodies of the state. After adoption of revised numeric nutrient standards in 2027 in rivers and streams, the commission intends that water quality based effluent limits will be implemented into permits after December 31, 2027.

While the commission has decided to delay the adoption of numeric nutrient values to 2027, it is committed to making additional progress towards nutrient reductions in Colorado during this second phase. The commission believes that the best way to make progress at this time is through an incentives program to encourage early reductions of nutrients. The incentives program will encourage facilities to make voluntary reductions of nutrients, and in exchange the facility will receive an extended compliance schedule as well as certainty about the year in which the facility will need to meet water quality based effluent limits. An extended compliance schedule means the facility will be given additional time to comply with water quality based effluent limits that would be based on the numeric values adopted in 2027. The commission believes that more progress can be made through an incentives program than through mandating reductions by medium sized facilities or facilities in a low priority watershed. For example, the commission believes that even if only the 15 largest dischargers took advantage of the incentives program, and if each of those facilities reduced its nitrogen 20% below the Regulation #85 effluent limits, the resulting load reduction in the state would be three times larger than what would be achieved if the Regulation #85 effluent limits were applied to all domestic wastewater treatment facilities with delayed implementation as identified in 85.5(1)(a)(ii). The commission believes this is the best current policy option to make effective progress in addressing nutrients management in Colorado at this time. The commission believes that reducing the phosphorus or nitrogen effluent limits in Regulation #85, or to apply those effluent limits to more facilities would result in substantially less progress in controlling nutrients in the next 10 years than will the incentive program. However, the commission does intend to evaluate the amount of improvement that occurs through the incentive program, and may revisit this approach and make additional modifications to its nutrients reduction strategy if this voluntary incentives program does not result in reductions as anticipated.

To achieve this goal of early nutrient reduction, the commission has adopted a voluntary incentive program. Participation in the program is entirely voluntary. The program does not require wastewater treatment facilities to implement a specific treatment technology, but it is anticipated that nutrient reductions will be achieved through BNR optimization, a water quality trade, a source reduction plan, watershed nutrient reductions, or capital improvements. A facility that achieves early reduction of nutrients will be offered an incentive in the form of an extended CDPS permit compliance schedule, which increases the number of years that the wastewater facility has to meet the water quality based effluent limits after 2027. The commission expects that the incentive will provide wastewater treatment facilities

additional time to identify funding sources necessary to make the capital infrastructure investment in tertiary treatment after 2027.

Regulatory framework for voluntary incentive program: The voluntary incentive program is outlined in Regulation 85.5(1.5). The commission intends that implementation of this program will be accomplished in conjunction with Commission Policy 17-1 that was adopted concurrent with this hearing. Permittees who wish to participate in the incentive program are required to submit a nutrient reduction plan on or before December 31, 2019, and annual nutrient monitoring reports to the division on or before March 31st of each year beginning in 2020. In order to qualify for the incentive program, the permittee must reduce nitrogen and/or phosphorus discharges to levels below those in Regulation #85 by December 31, 2026.

The annual reporting requirement provides the division with an opportunity to review a permittee's progress in reducing nutrient levels below those in Regulation #85 and to assess how those reductions relate to the incentives offered in Commission Policy 17-1. If a permittee is able to make early reductions in its discharge of nutrients, the permittee will qualify for an incentive which gives it additional time to comply with numeric nutrient values in Regulation #31, and Regulations #32 through 38 that are anticipated to be adopted in 2027. The amount of additional time granted will depend on the amount of nutrient concentration reduction that the wastewater facility achieves between 2019 and 2026.

The commission considered whether permittees subject to TMDLs should still be able to participate in the incentive program due to the fact that there is an impaired waterbody and the incentive program will result in participants receiving an extended period of time to meet their wasteload allocations. In particular, the commission heard concerns about participation by the dischargers subject to the Barr Milton TMDL. The commission ultimately decided that dischargers subject to a TMDL should still be able to participate in the incentive program because it will help drive earlier reductions. However, in the case of the dischargers subject to the Barr Milton TMDL, the commission decided that in order to continue to incentivize early nutrient reductions by those dischargers but yet address concerns about additional delay in implementation of the phosphorus wasteload allocations, that the method for earning incentive credit for total phosphorus reduction would be focused on further phosphorus reductions in line with the Barr Milton TMDL phosphorus targets. During the first review of Policy 17-1 which would typically take place in 2020, the commission will consider whether to extend the method that applies to the dischargers with a wasteload allocation pursuant to the Barr Milton TMDL to other dischargers within the Barr Milton watershed or even potentially more broadly. Should any entity determine that consideration of this change should occur prior to the deadline for opting into the incentive program on December 31, 2019, any entity can request that the commission consider changes prior to December 31, 2019.

The division will use Commission Policy 17-1 to make a determination about the amount of time that a permittee participating in the incentive program should be granted when it renews the permittee's CDPS permit after 2027. The division will rely on the nutrient incentives program annual reports in making this determination. If a permittee achieves early reduction of nutrients, it will be granted a compliance schedule in accordance with Commission Policy 17-1. Such compliance schedule may be revised or terminated if the division determines, under section 25-8-307, C.R.S., that the discharge or continued discharge of nutrients by an incentive program participant constitutes a "clear present and immediate danger to the health or livelihood of members of the public," or, under section 61.8(8)(a)(iv) of Regulation #61, that the "permitted activity endangers human health or the classified or existing uses of state waters and can only be regulated to acceptable levels by permit modification or termination. Examples of situations that could trigger the division's exercise of this authority could include but are not limited to a toxic algae bloom in receiving waters downstream of a wastewater treatment facility or the presence of pollutants that cause or contribute to unacceptably high concentrations of disinfection byproducts in drinking water treatment facilities with intake locations downstream of a wastewater treatment facility. They could also include situations where nutrient levels in receiving/downstream waters have reached extreme highs or have increased two or threefold since 2017, where streams or reservoirs have repeated algae blooms producing toxins in multiple years, or where there is demonstrable and significant impact to aquatic life or other animals that is attributable to nutrients.

Based on the environmental benefit anticipated from the voluntary nutrient reductions under the incentive program, the commission expects these circumstances to be rare. The commission recognizes that the voluntary nutrient reductions that will result from the incentive program participants may reduce the severity of the event by reducing nutrient concentrations below those that would otherwise have been permitted. The commission anticipates that in such a circumstance the division will evaluate all of the sources and work to control all of the sources concurrently or in succession, depending on the most appropriate approach in that particular case.

A permittee or other interested parties can challenge the division's determination implementing the voluntary incentive compliance schedule as part of the CDPS permit renewal schedule. If the annual nutrient monitoring reports demonstrate that a permittee has achieved early nutrient reductions in accordance with Commission Policy 17-1, there will be a presumption that a permittee is entitled to the additional time allotted.

It is the commission's determination that this approach will achieve the maximum practical degree of water quality in state waters consistent with the welfare of the state, and that this approach maximizes the beneficial uses of state waters while bearing a reasonable relationship to the economic, environmental, energy, and public health costs and impacts to the public. The commission intends that the incentive program as adopted in 2017 will be maintained for the participants through 2027. The commission will review the incentive program as part of its triennial process in 2022. If the commission determines that additional nutrient reductions beyond those that result from the incentive program are necessary during the program period, the commission intends that these additional reductions will be accomplished first through alternative regulatory mechanisms and only as a last resort will the commission change the incentive program.

Headwaters: In 2012, the commission adopted language in section 31.17(e)(i) indicating that the interim phosphorus and chlorophyll *a* values would only be considered for adoption in "headwaters located upstream of" certain domestic and non-domestic wastewater treatment facilities. The use of the term "headwaters" led to discussion in the 2013 basin hearing. In 2013, the commission determined that there was no need for a demonstration that waters are "high quality" headwaters in order to adopt phosphorus standards. In 2014, the commission made a policy determination not to apply the interim values below a facility with a cooling tower operated by Tri-State Generation and Transmission. The commission made changes to section 31.17(e)(i) in order to reflect these policy decisions as well as to avoid confusion by continuing to use the term "headwaters," which carries with it meaning and connotation in other contexts.

PARTIES TO THE RULEMAKING

1. City of Boulder, Centennial Water and Sanitation District, Littleton-Englewood Wastewater Treatment Plant, Metro Wastewater Reclamation District and Colorado Wastewater Utilities Council
2. AF CURE
3. City of Black Hawk and Black Hawk/Central City Sanitation District
4. Colorado Monitoring Framework
5. Eagle River Water and Sanitation District
6. Supervisory Committee of the Littleton/Englewood Wastewater Treatment Plant
7. Colorado Springs Utilities
8. North Front Range Water Quality Planning Association
9. Farmer's Reservoir and Irrigation Company
10. City of Fort Collins
11. Town of Fraser
12. MillerCoors, LLC
13. Plum Creek Water Reclamation Authority
14. Public Service Company of Colorado
15. City of Pueblo
16. Silverthorne/Dillon Joint Sewer Authority
17. Town of Telluride
18. Tri-Lakes Wastewater Treatment Facility

19. Tri-State Generation and Transmission Association, Inc.
20. Upper Blue Sanitation District
21. Dominion Water and Sanitation District
22. Parker Water and Sanitation District
23. City and County of Broomfield
24. Leprino Foods Company
25. Swift Beef Company

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