2013 TRIENNIAL REVIEW

DISCUSSION DRAFT

Standards for Interstate and Intrastate Surface Waters
20.6.4 NMAC

New Mexico Environment Department
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Hyperlinks to Use Attainability Analyses (UAAs) Referenced in Discussion Draft

1. HP UAAs for 18 non-perennial streams (statewide locations): http://www.nmenv.state.nm.us/swqb/documents/swqbdocs/Standards/UAA/UAA-UnclassifiedNon-PerennialReachesForNPDESPermits.pdf
2. HP UAAs for four non-perennial streams in southern New Mexico: http://www.nmenv.state.nm.us/swqb/documents/swqbdocs/Standards/UAA/HP/HydrologyProtocol-2013.pdf
3. HP UAAs for five drainages in the Chino Mine Investigation Area: http://www.nmenv.state.nm.us/swqb/UAA/Chino/index.html
4. Draft UAA for the Animas River: http://www.nmenv.state.nm.us/swqb/UAA/AnimasUAA-PublicDiscussionDRAFT.pdf

Triennial Review Public Discussion Draft
April 2014

This document contains the preliminary text of sections with the Department's proposal for changes followed by a brief rationale, or basis, for the change(s). Deleted materials are indicated by strikethrough, and new materials in the text are indicated by underline. In some cases preceding a revision, sections are retained for context and clarity of scope.

TITLE 20 ENVIRONMENTAL PROTECTION
CHAPTER 6 WATER QUALITY
PART 4 STANDARDS FOR INTERSTATE AND INTRASTATE SURFACE WATERS

20.6.4.1 ISSUING AGENCY: Water Quality Control commission.
[20.6.4.1 NMAC - Rp 20 NMAC 6.1.1001, 10-12-00]

20.6.4.2 SCOPE: Except as otherwise provided by statute or regulation of the water quality control commission, this part governs all surface waters of the state of New Mexico, which are subject to the New Mexico Water Quality Act, Sections 74-6-1 through 74-6-17 NMSA 1978.
[20.6.4.2 NMAC - Rp 20 NMAC 6.1.1002, 10-12-00; A, 05-23-05]

20.6.4.3 STATUTORY AUTHORITY: This part is adopted by the water quality control commission pursuant to Subsection C of Section 74-6-4 NMSA 1978.
[20.6.4.3 NMAC - Rp 20 NMAC 6.1.1003, 10-12-00]

20.6.4.4 DURATION: Permanent.
[20.6.4.4 NMAC - Rp 20 NMAC 6.1.1004, 10-12-00]

20.6.4.5 EFFECTIVE DATE: October 12, 2000, unless a later date is indicated in the history note at the end of a section.
[20.6.4.5 NMAC - Rp 20 NMAC 6.1.1005, 10-12-00]

20.6.4.6 OBJECTIVE:

A. The purpose of this part is to establish water quality standards that consist of the designated use or uses of surface waters of the state, the water quality criteria necessary to protect the use or uses and an antidegradation policy.

B. The state of New Mexico is required under the New Mexico Water Quality Act (Subsection C of Section 74-6-4 NMSA 1978) and the federal Clean Water Act, as amended (33 U.S.C. Section 1251 *et seq*.) to adopt water quality standards that protect the public health or welfare, enhance the quality of water and are consistent with and serve the purposes of the New Mexico Water Quality Act and the federal Clean Water Act. It is the objective of the federal Clean Water Act to restore and maintain the chemical, physical and biological integrity of the nation's waters, including those in New Mexico. This part is consistent with Section 101(a)(2) of the federal Clean Water Act, which declares that it is the national goal that wherever attainable, an interim goal of water quality that 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. Agricultural, municipal, domestic and industrial water supply are other essential uses of New Mexico's surface water; however, water contaminants resulting from these activities will not be permitted to lower the quality of surface waters of the state below that required for protection and propagation of fish, shellfish and wildlife and recreation in and on the water, where practicable.

C. Pursuant to Subsection A of Section 74-6-12 NMSA 1978, this part does not grant to the water quality control commission or to any other entity the power to take away or modify property rights in water.

[20.6.4.6 NMAC - Rp 20 NMAC 6.1.1006, 10-12-00; A, 05-23-05]

20.6.4.7 DEFINITIONS: Terms defined in the New Mexico Water Quality Act, but not defined in this part will have the meaning given in the Water Quality Act.

A. Terms beginning with numerals or the letter "A," and abbreviations for units.

(1) "4T3 temperature" means the temperature not to be exceeded for four or more consecutive hours in a 24-hour period on more than three consecutive days.

(2) "6T3 temperature" means the temperature not to be exceeded for six or more consecutive hours in a 24-hour period on more than three consecutive days.

(3) Abbreviations used to indicate units are defined as follows:

(a) "cfu/100 mL" means colony-forming units per 100 milliliters.

20.6.4.7.A(3)(b) through 20.6.4.7.A(3)(f) – No changes proposed

(g) "MPN" means most probable number per 100 milliliters.

(gh) "NTU" means nephelometric turbidity unit;

(~~h~~i) "pCi/L" means picocuries per liter.

(j) "pH" means the measure of the acidity or alkalinity and is expressed in standard units (su).

BASIS FOR CHANGE: The Department is proposing the addition of language to Subsections D and E of 20.6.4.900 NMAC that acknowledges the use of alternate enumeration methods for *E. coli* bacteria including most probable number (MPN) approved by EPA (68 FR 43272, July 21, 2003 and 72 FR 14220, March 26, 2007) for the detection of enterococci and *E. coli* in ambient waters and in wastewater and sludge. Therefore, the abbreviation and units for most probable number (as MPN) is recommended as a revision.

A definition for pH and the unit of measure for pH, standard units, is also suggested to be included in the abbreviations as pH is mentioned throughout the water quality standards, but neither pH nor its unit of measure (su) is defined.

20.6.4.7.A(4) through 20.6.4.7.B(4) – No changes proposed

C. Terms beginning with the letter "C".

(1) "**CAS number**" means an assigned number by chemical abstract service (CAS) to identify a substance. CAS numbers index information published in chemical abstracts by the American chemical society.

(2) "Chronic toxicity" means toxicity involving a stimulus that lingers or continues for a relatively long period relative to the life span of an organism. Chronic effects include, but are not limited to, lethality, growth impairment, behavioral modifications, disease and reduced reproduction.

(3) "Classified water of the state" means a surface water of the state, or reach of a surface water of the state, for which the commission has adopted a segment description and has designated a use or uses and applicable water quality criteria in 20.6.4.101 through 20.6.4.899 NMAC.

(4) "Closed basin" is a basin where topography prevents the surface outflow of water and water escapes by evapotranspiration or percolation.

(45) "Coldwater" in reference to an aquatic life use means a surface water of the state where the water temperature and other characteristics are suitable for the support or propagation or both of coldwater aquatic life.

(56) "Coolwater" in reference to an aquatic life use means the water temperature and other characteristics are suitable for the support or propagation of aquatic life whose physiological tolerances are intermediate between and may overlap those of warm and coldwater aquatic life.

(67) "Commission" means the New Mexico water quality control commission.

(78) "Criteria" are elements of state water quality standards, expressed as constituent concentrations, levels or narrative statements, representing a quality of water that supports a use. When criteria are met, water quality will protect the designated use.

BASIS FOR CHANGE: A definition for 'closed basin' is added.

20.6.4.7.D through 20.6.4.7.H(2) – No changes proposed

I. Terms beginning with the letter "I".

(1) "Industrial water supply" means the use or storage of water by a facility for process operations unless the water is supplied by a public water system. Industrial water supply does not include irrigation or other agricultural uses.

(2) "Intermittent" when used to describe a surface water of the state means the water body contains water for extended periods only at certain times of the year, such as when it receives seasonal flow from springs or melting snow.

(3) "Interstate waters" means all surface waters of the state that cross or form a part of the border between states.

(4) "Intrastate waters" means all surface waters of the state that are not interstate waters.

(5) "Irrigation" ~~**or "irrigation storage"**~~ means application of water to land areas to supply the water needs of beneficial plants.

(6) "Irrigation storage" means storage of water to supply the needs of beneficial plants.

J. Terms beginning with the letter "J". [RESERVED]

K. Terms beginning with the letter "K". [RESERVED]

BASIS FOR CHANGE: Most reservoirs classified in the water quality standards include the designated use 'irrigation storage' as described in Subsection C of 20.6.4.900 NMAC. The

irrigation and irrigation storage designated uses have identical criteria assigned in Subsections C and J, of 20.6.4.900 NMAC, but irrigation storage is not defined in Subsection I, subparagraph I(5) of 20.6.4.7 NMAC. Therefore, a definition for irrigation storage is recommended to be added.

20.6.4.7.L – through 20.6.4.W(5) - No changes proposed

X. Terms beginning with the letters "X" through "Z". [RESERVED]
[20.6.4.7 NMAC - Rp 20 NMAC 6.1.1007, 10-12-00; A, 7-19-01; A, 05-23-05; A, 07-17-05; A, 08-01-07; A, 12-01-10; A, 01-14-11, A, XX-XX-XX]

20.6.4.10 REVIEW OF STANDARDS; NEED FOR ADDITIONAL STUDIES:

A. Section 303(c)(1) of the federal Clean Water Act requires that the state hold public hearings at least once every three years for the purpose of reviewing water quality standards and proposing, as appropriate, necessary revisions to water quality standards.

B. It is recognized that, in some cases, numeric criteria have been adopted that reflect use designations rather than existing conditions of surface waters of the state. Narrative criteria are required for many constituents because accurate data on background levels are lacking. More intensive water quality monitoring may identify surface waters of the state where existing quality is considerably better than the established criteria. When justified by sufficient data and information, the water quality criteria will be modified to protect the attainable uses.

C. It is also recognized that contributions of water contaminants by diffuse nonpoint sources of water pollution may make attainment of certain criteria difficult. Revision of these criteria may be necessary as new information is obtained on nonpoint sources and other problems unique to semi-arid regions.

D. Site-specific criteria.

(1) The commission may adopt site-specific numeric criteria applicable to all or part of a surface water of the state based on relevant site-specific conditions such as:

(a) actual species at a site are more or less sensitive than those used in the national criteria data set;

(b) physical or chemical characteristics at a site such as pH or hardness alter the biological availability and/or toxicity of the chemical;

(c) physical, biological or chemical factors alter the bioaccumulation potential of a chemical;

(d) the concentration resulting from natural background exceeds numeric criteria for aquatic life, wildlife habitat or other uses if consistent with Subsection E of 20.6.4.10 NMAC; or

(e) other factors or combination of factors that upon review of the commission may warrant modification of the default criteria, subject to EPA review and approval.

(2) Site-specific criteria must fully protect the designated use to which they apply. In the case of human health-organism only criteria, site-specific criteria must fully protect human health when organisms are consumed from waters containing pollutants.

(3) Any person may petition the commission to adopt site-specific criteria. A petition for the adoption of site-specific criteria shall:

(a) identify the specific waters to which the site-specific criteria would apply;

(b) explain the rationale for proposing the site-specific criteria;

(c) describe the methods used to notify and solicit input from potential stakeholders and from the general public in the affected area, and present and respond to the public input received;

(d) present and justify the derivation of the proposed criteria.

(4) A derivation of site-specific criteria shall rely on a scientifically defensible method, such as one of the following:

(a) the recalculation procedure, the water-effect ratio for metals procedure or the resident species procedure as described in the water quality standards handbook (EPA-823-B-94-005a, 2nd edition, August 1994);

(b) the streamlined water-effect ratio procedure for discharges of copper (EPA-822-R-01-005, March 2001);

(c) the biotic ligand model as described in aquatic life ambient freshwater quality criteria - copper (EPA-822-R-07-001, February 2007);

(d) the methodology for deriving ambient water quality criteria for the protection of human health (EPA-822-B-00-004, October 2000) and associated technical support documents; or

(e) a determination of the natural background of the water body as described in Subsection E of 20.6.4.10 NMAC.

E. Site-specific criteria based on natural background. The commission may adopt site-specific criteria equal to the concentration resulting from natural background where that concentration protects the designated use. The concentration resulting from natural background supports the level of aquatic life and wildlife habitat expected to occur naturally at the site absent any interference by humans. Domestic water supply, primary or secondary contact, or human health-organism only criteria shall not be modified based on natural background. A determination of natural background shall:

(1) consider natural spatial and seasonal to interannual variability as appropriate;

(2) document the presence of natural sources of the pollutant;

(3) document the absence of human sources of the pollutant or quantify the human contribution; and

(4) rely on analytical, statistical or modeling methodologies to quantify the natural background.

~~[20.6.4.10 NMAC - Rp 20 NMAC 6.1.1102, 10-12-00; Rn, 20.6.4.9 NMAC, 05-23-05; A, 05-23-05; A, 12-01-10]~~

F. Temporary Criteria.

(1) Any person may petition the commission to adopt a temporary criterion applicable to all or part of a surface water of the state as provided for in this section. The commission may adopt a proposed temporary criterion if the applicable criterion is not being attained as reported in the CWA Section 305(b)/303(d) Integrated Report and the petitioner demonstrates that:

(a) attainment of the associated designated use is not feasible in the short term due to one or more of the factors listed in 40 CFR 131.10(g) as demonstrated by means of a use attainability analysis completed pursuant to 20.6.4.15 NMAC;

(b) the proposed temporary criterion represents the highest degree of protection feasible in the short term and adoption will not cause loss or impairment of an existing use; and

(c) existing or proposed discharge control technologies will comply with applicable technology-based limitations and feasible technological controls and other management alternatives, such as a pollution prevention program.

(2) A temporary criterion shall apply to a specific pollutant(s), or to a specific water body segment(s). The adoption of a temporary criterion does not exempt dischargers from complying with all other applicable criteria.

(3) Designated uses shall not be modified on a temporary basis. Designated use attainment as reported in the CWA Section 305(b)/303(d) Integrated Report shall be based on the original criteria, not on interim criteria.

(4) A petition for a temporary criterion shall:

(a) identify the current applicable criterion, the proposed temporary criterion and the surface water(s) of the state to which the temporary criteria would apply;

(b) demonstrate that the proposed temporary criterion meets the requirements in this Subsection;

(c) present a plan and timetable for achieving compliance with the original criterion, including any investigations, projects, facility modifications, monitoring, or other measures; and

(d) include any other information necessary to support the petition.

(5) The commission may condition the approval of a temporary criterion by requiring monitoring, relevant analyses, the completion of specified projects, submittal of information, or other actions.

(6) Any person may submit notice to the department stating the intent to propose a temporary criterion. The proponent shall develop a work plan to conduct the analyses required in this Subsection, and shall submit the work plan to the department and region 6 EPA for review and comment. The work plan shall identify the factors affecting attainment of the criterion that will be analyzed, and the provisions for public notice and consultation with appropriate state and federal agencies. Upon approval of the work plan by the department, the proponent shall conduct the analyses in accordance with the approved work plan. The cost of such analyses shall be the responsibility of the proponent. Upon completion of the analyses, the proponent shall submit the conclusions to the department. The department or the proponent may petition the commission to adopt a temporary criterion if the department determines the conclusions of the analyses support such action.

(7) Temporary criteria may be implemented only after appropriate public participation, commission approval and adoption pursuant to this Subsection, and EPA Clean Water Act Section 303 (c) approval.

(8) Unless renewed, a temporary criterion shall expire no later than the effective date of the next triennial review required by Subsection A of 20.6.4.10 NMAC. The commission may consider a petition for renewal. The effective period of a temporary criterion shall be extended only if the factors precluding attainment of the underlying criterion still apply, if the petitioner is meeting the conditions for approval of the interim criterion, and if reasonable progress towards meeting the underlying criterion is being achieved.

(9) Upon expiration of a temporary criterion, the original criterion becomes applicable.

(10) Temporary criteria shall be identified in 20.6.4.97 – 899 NMAC as appropriate for the surface water affected.

[20.6.4.10 NMAC - Rp 20 NMAC 6.1.1102, 10-12-00; Rn, 20.6.4.9 NMAC, 05-23-05; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The federal water quality standards (WQS) regulations at 40 CFR 131 and the federal permitting regulations at 40 CFR 122 provide a number of tools for states and tribes to adopt that allow for regulatory flexibilities when implementing WQS programs. States can adopt procedures or rules for allowing development of site-specific criteria, revision of designated uses, provisions for dilution allowances or mixing zones, permit compliance schedules or enactment of temporary or interim water quality criteria. New Mexico has already adopted several of these federally approved tools to assist point and non-point sources meet designated uses and applicable water quality criteria.

The EPA defines an interim or temporary water quality criteria as a "time limited designated use [or] criteria" (EPA Publication No. EPA-820-F-13-012, March 2013). The temporary criteria may be appropriate where "groups of permitees are experiencing the same challenges in meeting their water quality based effluent limits…for the same pollutant, regardless of whether or not the permitees are located on the same waterbody." *Id.* The state may adopt or implement a temporary water quality criteria where an applicant, through a public hearing process, reasonably demonstrates that the unmodified applicable criteria is not attainable based on those factors in 40 CFR 131.10(g). The central principal of this tool, as compared to site-specific studies or change of designated use(s), is that the underlying designated use and criteria are not changed, modified or replaced. Where implemented, the interim or temporary water quality standard(s) requires regulated facilities to implement adaptive and increasingly restrictive controls or technology which may not be then available or practical, but is necessary to improve the overall water quality.

While EPA's guidance document refers to temporary or interim water quality criteria as a 'variance,' the New Mexico Water Quality Act, NMSA 1978, 74-6-1, *et. seq.*, and ensuing regulations already define "variance" as an individual discharge permit-specific exclusion from regulation. *See generally* NMSA 1978 § 74-6-4 (h). To avoid duplicative terms and meaning, the Bureau finds that the term 'temporary criteria' is more appropriate within the scope of the water quality standards and avoids confusion with other state variance rules and regulations. As proposed here, and as required by 40 CFR 131, an applicant proposing the interim or temporary water quality criteria must satisfy the WQCC's public notice, hearing, and appellate procedures before adoption. The EPA must also authorize the State's adoption of the criteria. In sum, these amendments will provide well documented and authorized flexibility to regulated entities in meeting the state's water quality standards.

20.6.4.11 – 20.6.4.15 – No changes proposed.

20.6.4.16 PLANNED USE OF A PISCICIDE: The use of a piscicide registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. Section 136 *et seq*., and under the New Mexico Pesticide Control Act (NMPCA), Section 76-4-1 *et seq*. NMSA 1978 (1973) in a surface water of the state, shall not be a violation of Subsection F of 20.6.4.13

NMAC when such use is covered by a National Pollutant Discharge Elimination System (NPDES) permit or has been approved by the commission under procedures provided in this section. The use of a piscicide which is covered by a NPDES permit shall require no further review by the commission and the person whose application is covered by the NPDES permit shall meet the additional notification and monitoring requirements outlined in Subsection F of 20.6.4.16 NMAC. The commission may approve the reasonable use of a piscicide under this section if the proposed use is not covered by a NPDES permit to further a Clean Water Act objective to restore and maintain the physical or biological integrity of surface waters of the state, including restoration of native species.

A. Any person seeking commission approval of the use of a piscicide not covered by an NPDES permit shall file a written petition concurrently with the commission and the surface water bureau of the department. The petition shall contain, at a minimum, the following information:

(1) petitioner's name and address;

(2) identity of the piscicide and the period of time (not to exceed five years) or number of applications for which approval is requested;

(3) documentation of registration under FIFRA and NMPCA and certification that the petitioner intends to use the piscicide according to the label directions, for its intended function;

(4) target and potential non-target species in the treated waters and adjacent riparian area, including threatened or endangered species;

(5) potential environmental consequences to the treated waters and the adjacent riparian area, and protocols for limiting such impacts;

(6) surface water of the state proposed for treatment;

(7) results of pre-treatment survey;

(8) evaluation of available alternatives and justification for selecting piscicide use;

(9) post-treatment assessment monitoring protocol; and

(10) any other information required by the commission.

B. Within thirty days of receipt of the petition, the department shall review the petition and file a recommendation with the commission to grant, grant with conditions or deny the petition. The recommendation shall include reasons, and a copy shall be sent to the petitioner by certified mail.

C. The commission shall review the petition and the department's recommendation and ~~shall~~ within 90 days of receipt of the department's recommendation may hold a public hearing in the locality affected by the proposed use in accordance with Adjudicatory Procedures, 20.1.3 NMAC. In addition to the public notice requirements in Adjudicatory Procedures, 20.1.3 NMAC, the petitioner shall provide written notice to:

(1) local political subdivisions;

(2) local water planning entities;

(3) local conservancy and irrigation districts; and

(4) local media outlets, except that the petitioner shall only be required to publish notice in a newspaper of circulation in the locality affected by the proposed use.

D. In a hearing provided for in this Section or, if no hearing is held, in a commission meeting, the registration of a piscicide under FIFRA and NMPCA shall provide a rebuttable presumption that the determinations of the EPA Administrator in registering the piscicide, as outlined in 7 U.S.C. Section 136a(c)(5), are valid. For purposes of this Section the rebuttable presumptions regarding the piscicide include:

(1) Its composition is such as to warrant the proposed claims for it;

(2) Its labeling and other material submitted for registration comply with the requirements of FIFRA and NMPCA;

(3) It will perform its intended function without unreasonable adverse effects on the environment; and

(4) When used in accordance with all FIFRA label requirements it will not generally cause unreasonable adverse effects on the environment.

(5) "Unreasonable adverse effects on the environment" has the meaning provided in FIFRA, 7 U.S.C. Section 136(bb): "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide."

E. After a public hearing or commission meeting, if no hearing is held, the commission may grant the petition in whole or in part, may grant the petition subject to conditions, or may deny the petition. In granting any petition in whole or part or subject to conditions, the commission shall require the petitioner to implement post-treatment assessment monitoring and provide notice to the public in the immediate and near downstream vicinity of the application prior to and during the application.

F. Any person whose application is covered by a NPDES permit shall provide written notice to local entities as described in 20.6.4.16 subsection C (1) to (4) and subsection (E) and implement post-treatment assessment monitoring within the application area.

[20.6.4.16 NMAC - Rn, Paragraph (6) of Subsection F of 20.6.4.12 NMAC, 05-23-05; A, 05-23-05; A, XX-XX-XX]

BASIS FOR CHANGE: Language in the water quality standards for piscicide application was first developed during the 1998-99 Triennial Revisions to address species management and restoration by the New Mexico Department of Game and Fish (NMDGF), and was approved by the Water Quality Control Commission (WQCC) on December 30, 1999. During the 2003-05 Triennial Revisions, the language was revised to streamline processes, and moved to a new section (20.6.4.16 NMAC). These changes were adopted by the WQCC and submitted with the other Triennial Revisions for EPA's approval under CWA 303 (c). At the time, EPA was not compelled to determine whether the application of piscicides was subject to EPA's National Pollutant Discharge Elimination System (NPDES) permit regulations. While EPA was supportive of 20.6.4.16 NMAC for restoration purposes, it was considered a State rule that was not subject to EPA's CWA 303(c) approval.

In January 2009, a federal court ruling determined certain pesticide applications, including those for piscicides, were subject to EPA NPDES permit regulations; the federal rule was finalized on October 31, 2011. Consequently, in addition to requirements under the State's rules certain applicators (i.e., New Mexico Department of Game and Fish) are required to also have a NPDES permit and may apply for coverage under EPA's NPDES Pesticide General Permit (PGP). In order to avoid duplication in fulfilling both state and federal requirements, the Department is proposing to update the piscicide provision by including an exemption for those covered under the EPA's NPDES permit program. If an applicator has coverage under an EPA NPDES permit, no further review by the Department or the Commission is required. The applicator however must still meet the additional notification and monitoring requirements outlined in Subsection F. Furthermore, project proponents must comply with all other applicable federal and state laws

and/or regulations governing the application of a piscicide to a surface water of the state. If an applicator is not covered under an EPA NPDES permit, the requirements in Subsection A. (1) – (10) and Subsection B (Department review and recommendation within 30 days) must still be met. Also, if an applicator is not covered under an EPA permit, Subsection C is revised to allow the Commission discretion on whether to conduct/hold a public hearing for piscicide application in the affected locality. However, the petitioner is still held to the written notice requirements in Subsection C. (1) – (4). Subsections D and E are revised to be consistent with the Commission's discretion to hold either a meeting or public hearing as specified in Subsection C, but otherwise the requirements in Subsections D and E are not proposed for revision. Subsection F is proposed to ensure notification and post monitoring processes required under the state provisions but not required in the federal NPDES PGP permit are adhered to.

20.6.4.17 - 20.6.4.49: [RESERVED]

20.6.4.50 BASINWIDE PROVISIONS - Special provisions arising from interstate compacts, international treaties or court decrees or that otherwise apply to a basin are contained in 20.6.4.51 through 20.6.4.59 NMAC.
[20.6.4.50 NMAC - N, 05-23-05]

20.6.4.51: [RESERVED]

20.6.4.52 PECOS RIVER BASIN - In order to protect existing and designated uses, it is a goal of the state of New Mexico to prevent increases in TDS in the Pecos river above the following benchmark values, which are expressed as flow-weighted, annual average concentrations, at three USGS gaging stations: at Santa Rosa 500 mg/L; near Artesia 2,700 mg/L; and near Malaga 3,600 mg/L. The benchmark values serve to guide state action. They are adopted pursuant to the New Mexico Water Quality Act, not the Clean Water Act.
[20.6.4.52 NMAC - N, 12-01-10]

20.6.4.53: [RESERVED]

20.6.4.54 COLORADO RIVER BASIN - For the tributaries of the Colorado river system, the state of New Mexico will cooperate with the Colorado river basin states and the federal government to support and implement the salinity policy and program outlined in the most current "review, water quality standards for salinity, Colorado river system" or equivalent report by the Colorado river salinity control forum.

A. Numeric criteria expressed as the flow-weighted annual average concentration for salinity are established at three points in the Colorado river basin as follows: below Hoover dam, 723 mg/L; below Parker dam, 747 mg/L; and at Imperial dam, 879 mg/L.

B. As a part of the program, objectives for New Mexico shall include the elimination of discharges of water containing solids in solution as a result of the use of water to control or convey fly ash from coal-fired electric generators, wherever practicable.
[20.6.4.54 NMAC - Rn, Paragraphs (1) through (3) of Subsection K of 20.6.4.12 NMAC, 05-23-05; A, 05-23-05]

20.6.4.55 - 20.6.4.96: [RESERVED]

20.6.4.97 EPHEMERAL WATERS - Ephemeral ~~unclassified~~ surface waters of the state as identified below and additional ephemeral waters as identified on the department's water quality standards website pursuant to Subsection C of 20.6.4.15 NMAC.

A. Designated Uses: livestock watering, wildlife habitat, limited aquatic life and secondary contact.

B. Criteria: the use-specific criteria in 20.6.4.900 NMAC are applicable to the designated uses.

C. Waters:

(1) the following waters are designated in the **Rio Grande basin**:

(a) Cunningham gulch from Santa Fe county road 55 upstream 1.4 miles to a point upstream of the LAC Minerals mine, identified as Ortiz Mine on USGS topographic maps;

(b) an unnamed tributary from Arroyo Hondo upstream 0.4 miles to the Village of Oshara water reclamation facility outfall;

(c) an unnamed tributary from San Pedro creek upstream 0.8 miles to the PAA-KO community sewer outfall;

(d) Inditos draw from the crossing of an unnamed road along a power line one-quarter mile west of McKinley county road 19 upstream to New Mexico highway 509;

(e) an unnamed tributary from the diversion channel connecting Blue canyon and Socorro canyon upstream 0.6 miles to the New Mexico Firefighters Academy treatment facility outfall;

(f) an unnamed tributary from the AMAFCA Rio Grande south channel upstream of the crossing of New Mexico highway 47 upstream to I-25;

(g) the south fork of Cañon del Piojo from Canon del Piojo upstream 1.2 miles to an unnamed tributary;

(h) an unnamed tributary from the south fork of Cañon del Piojo upstream 1 mile to the Resurrection mine outfall;

(i) Arroyo del Puerto from San Mateo creek upstream 6.8 miles to the Ambrosia Lake mine entrance road;

(j) an unnamed tributary from San Mateo creek upstream 1.5 miles to the Roca Honda mine facility outfall in NPDES permit number;

(k) San Isidro arroyo from the Lee Ranch mine facility outfall upstream to Tinaja arroyo;

(l) Tinaja arroyo from San Isidro arroyo upstream to Mulatto canyon; and

(m) Mulatto canyon from Tinaja arroyo upstream to 1 mile northeast of the Cibola national forest boundary.

(2) the following waters are designated in the **Pecos river basin**:

(a) an unnamed tributary from Hart canyon upstream 1 mile to South Union road;

(b) Aqua Chiquita from Rio Peñasco to upstream of McEwan canyon; and

(c) Grindstone canyon upstream of Grindstone Reservoir.

(3) the following waters are designated in the **Canadian river basin**:

(a) Bracket canyon upstream of the Vermejo river;

(b) an unnamed tributary from Bracket canyon upstream 2 miles to the Ancho mine; and

(c) Gachupin canyon from the Vermejo river upstream 2.9 miles to an unnamed west tributary near the Ancho mine outfall.

(4) in the **San Juan river basin** an unnamed tributary of Kim-me-ni-oli wash upstream of the mine outfall.

(5) the following waters are designated in the **Little Colorado river basin**:

(a) Defiance draw from County Road 1 to upstream of West Defiance Road; and

(b) an unnamed tributary of Defiance draw from McKinley County Road 1 upstream to New Mexico Highway 264.

(6) the following waters are designated in the **closed basins**:

(a) in the Tularosa river closed basin San Andres canyon downstream of South San Andres canyon; and

(b) in the Mimbres river closed basin:

(i) San Vicente arroyo from the Mimbres river upstream to Maude's canyon;

(ii) Chino mines property Subwatershed Drainage A and tributaries thereof;

(iii) Chino Mines property Subwatershed Drainage B and tributaries thereof (excluding the northwest tributary containing Ash Spring);

(iv) Chino Mines property Subwatershed Drainage C and tributaries thereof (excluding reaches containing Bolton spring, the Chiracahua Leopard Frog critical habitat transect, and all reaches in Subwatershed C that are upstream of the Chiracahua Leopard Frog critical habitat);

(v) Subwatershed Drainage D and tributaries thereof (Drainages D-1, D-2 and D-3, excluding the southeast tributary in drainage D1 that contains Brown Spring); and,

(vi) Subwatershed Drainage E and tributaries thereof (Drainages E-1, E-2 and E-3).

[20.6.4.97 NMAC - N, 05-23-05; A, 12-01-10; A, XX-XX-XX]

~~[**NOTE:** Effective 12-01-10, no waters are yet approved for listing in Subsection C of this section.]~~

BASIS FOR CHANGE: Amendments to the state's water quality standards during the 2005 and 2009 triennial revisions, and subsequent approvals by the state's Water Quality Control Commission (WQCC) and EPA allow the use of the Department's Hydrology Protocol (HP) to support the revisions of standards for ephemeral waters. In accordance with Subsection C of 20.6.4.15 NMAC, this protocol can be used to provide technical support for a Use Attainability Analysis (UAA) to determine the hydrology of waters or to characterize waters, within an otherwise classified segment. The process for implementing the HP was approved as an appendix to the Department's Water Quality Management Plan/Continuing Planning Process document (WQMP/CPP) by the WQCC on May 10, 2011, and by EPA on December 23, 2011.

The Department is petitioning the Commission to list waters previously granted technical approval by EPA as ephemeral under Subsection C of 20.6.4.97 NMAC. The Department has also submitted additional HP UAAs to EPA for technical approval, as indicated below. Once approved by the WQCC and adopted as standards, the Department will submit the revised water

quality standards (as published in the New Mexico Register) to EPA for formal review and final approval action under Section 303(c) of the CWA.

The Department is also proposing removal of the term "unclassified" for those waters which have been characterized as ephemeral under the HP, and adds the term "surface" to be consistent with the term "surface water(s) of the state" defined in Subsection S of 20.6.4.7 NMAC.

For ephemeral waters proposed under Subsection C, 20.6.4.97 NMAC: C (1); C (2) (a); (C) (3); (C) (4), and (C) (5). The Department has completed the application of the HP to document the hydrologic condition of unclassified, non-perennial stream segments associated with 13 NPDES permitted facilities located throughout New Mexico. The results supported a UAA finding that the streams are ephemeral, that primary contact and warmwater aquatic life uses are not attainable due to natural conditions, and that the appropriate water quality standards designation for these streams is under Section 20.6.4.97 NMAC. In accordance with the regulations in Subsection C, 20.6.4.15 NMAC and the WQMP/CPP procedures, the UAAs were posted on the Department's SWQB's water quality standards website for a 30-day public comment period ending on August 27, 2012. The UAAs and responses to comments were submitted to EPA on October 11, 2012 for formal technical approval. EPA has provided technical approval of these UAAs on December 30, 2013, concluding that the uses and criteria apply as described in Section 20.6.4.97 NMAC for all regulatory purposes under the CWA. The applicability of Section 20.6.4.97 NMAC to these waters was posted on the SWQB's water quality standards website following EPA's technical approval. The waters are proposed to be listed in Subsection C, 20.6.4.97. Once approved and adopted by the WQCC, the revisions will be submitted to EPA for final 303(c) approval.

For ephemeral waters proposed under Subsection C, 20.6.4.97 NMAC: C (2) (b) and (c); and C (6) (a) and (b)(i). The Department has completed the application of the HP to document the hydrologic condition of four unclassified, non-perennial stream segments in the Pecos River basin, Tularosa River closed basin and the Mimbres River closed basin and finds that the designated uses applicable to 20.6.4.97 NMAC are appropriate and attainable. As required by Subsection C, 20.6.4.15 NMAC, these UAAs were posted on NMED's website on August 14, 2013. Comment was invited during the 30-day public review which ended on September 13, 2013. There was one comment in support of the UAA; the report and supporting documents were sent to EPA for technical approval on October 17, 2013. EPA's technical approval was provided on December 19, 2013**.**

For ephemeral waters proposed under Subsection C, 20.6.4.97 NMAC: C (6) (b)(ii)-(vi); Chino Mines property Subwatershed Drainages A, B, C, D and E (as described). The Department's HP UAA process was conducted by Freeport MacMoRan (Chino Mines) to determine the appropriate water quality standards for five non-perennial drainages located in the Mimbres watershed. As required by Subsection C, 20.6.4.15 NMAC, these UAAs were posted on NMED's website on January 15, 2013. Comment was invited during the 30-day public review which ended on February 14, 2013. In response to public and Department comments, further reconnaissance was conducted by the Department and as a result, the UAAs revised from the public noticed draft. The revised UAA report and supporting documents (public comments

received, and the Department's response to comments) were sent to EPA for technical approval on June 28, 2013; **EPA's technical approval is pending.**

20.6.4.98 INTERMITTENT WATERS - All non-perennial ~~unclassified~~ surface waters of the state, except those ephemeral waters included under 20.6.4.97 NMAC or classified in 20.6.4.100 thru 899.

A. Designated Uses: livestock watering, wildlife habitat, marginal warmwater aquatic life and primary contact.

B. Criteria: the use-specific criteria in 20.6.4.900 NMAC are applicable to the designated uses, except that the following site-specific criteria apply: the monthly geometric mean of E. coli bacteria 206 cfu/100 mL or less, single sample 940 cfu/100 mL or less. [20.6.4.98 NMAC - N, 05-23-05; A, 12-01-10; A, XX-XX-XX]]

20.6.4.99 PERENNIAL WATERS - All perennial ~~unclassified~~ surface waters of the state except those classified in 20.6.4.100 thru 899.

A. Designated Uses: warmwater aquatic life, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific criteria in 20.6.4.900 NMAC are applicable to the designated uses, except that the following site-specific criteria apply: the monthly geometric mean of E. coli bacteria 206 cfu/100 mL or less, single sample 940 cfu/100 mL or less. [20.6.4.99 NMAC - N, 05-23-05; A, 12-01-10; A, XX-XX-XX]]

BASIS FOR CHANGE: The Department is proposing removal of the term "unclassified" in Sections 20.6.4.98 and 20.6.4.99 NMAC. The term "surface" is added to be consistent with the term "surface water(s) of the state" which is defined in Subsection S of 20.6.4.7 NMAC. In previous Triennial and interim revisions, the Department has clarified the presumption of CWA Section 101(a)(2) uses for all surface water of the state, including those not "classified" or described in segments under Sections 20.6.4.101-899 NMAC.

20.6.4.100: [RESERVED]

20.6.4.101 RIO GRANDE BASIN - The main stem of the Rio Grande from the international boundary with Mexico upstream to one mile ~~below~~ downstream of Percha dam.

A. Designated Uses: irrigation, marginal warmwater aquatic life, livestock watering, wildlife habitat and primary contact.

B. Criteria:

(1) The use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses except that the following segment-specific criterion applies: temperature 34°C (93.2°F) or less.

(2) At mean monthly flows above 350 cfs, the monthly average concentration for: TDS 2,000 mg/L or less, sulfate 500 mg/L or less and chloride 400 mg/L or less.

C. Remarks: sustained flow in the Rio Grande below Caballo reservoir is dependent on release from Caballo reservoir during the irrigation season; at other times of the year, there may be little or no flow.

[20.6.4.101 NMAC - Rp 20 NMAC 6.1.2101, 10-12-00; A, 12-15-01; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]]

BASIS FOR CHANGE: The word 'below' is replaced with the hydrologic term 'downstream of' in the segment description.

20.6.4.102 RIO GRANDE BASIN - The main stem of the Rio Grande from one mile ~~below~~ downstream of Percha dam upstream to Caballo dam.

A. Designated Uses: irrigation, livestock watering, wildlife habitat, primary contact and warmwater aquatic life.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

C. Remarks: sustained flow in the Rio Grande below Caballo reservoir is dependent on release from Caballo reservoir during the irrigation season; at other times of the year, there may be little or no flow.

[20.6.4.102 NMAC - Rp 20 NMAC 6.1.2102, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]]

BASIS FOR CHANGE: The word 'below' is replaced with the hydrologic term 'downstream of' in the segment description.

20.6.4.103 RIO GRANDE BASIN - The main stem of the Rio Grande from the headwaters of Caballo reservoir upstream to Elephant Butte dam and perennial reaches of tributaries to the Rio Grande in Sierra and Socorro counties, excluding waters on tribal lands.

A. Designated Uses: irrigation, livestock watering, wildlife habitat, marginal coldwater aquatic life, ~~secondary~~ primary contact and warmwater aquatic life.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.

C. Remarks: flow in this reach of the Rio Grande main stem is dependent upon release from Elephant Butte dam.

[20.6.4.103 NMAC - Rp 20 NMAC 6.1.2103, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]]

BASIS FOR CHANGE: Based on a survey conducted by the Department during 2011-2012 (at Elephant Butte and Caballo Dam/Reservoirs), this segment has an existing use of primary contact. While swimming in this area is "at your own risk", this portion of the Rio Grande is accessible for swimming, and bodily contact can occur with a risk of ingesting water. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational

contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.104 – 20.6.4.109 – No changes proposed.

20.6.4.110 RIO GRANDE BASIN - The main stem of the Rio Grande from Angostura diversion works upstream to Cochiti dam, excluding the reaches on San Felipe, ~~Santo Domingo~~Kewa and Cochiti pueblos.
A. Designated Uses: irrigation, livestock watering, wildlife habitat, primary contact, coldwater aquatic life and warmwater aquatic life.
B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: pH within the range of 6.6 to 9.0 and temperature 25°C (77°F) or less.
[20.6.4.110 NMAC - Rp 20 NMAC 6.1.2108, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]]

BASIS FOR CHANGE: In 2009, the Pueblo formerly known as Santa Domingo officially changed its name to Kewa Pueblo; therefore, this change is proposed to be incorporated into the segment description.

20.6.4.111 – 20.6.4.115 – No changes proposed.

20.6.4.116 RIO GRANDE BASIN - The Rio Chama from its mouth on the Rio Grande upstream to Abiquiu reservoir, perennial reaches of the Rio Tusas, perennial reaches of the Rio Ojo Caliente, perennial reaches of Abiquiu creek and perennial reaches of El Rito creek ~~below~~ downstream of the town of El Rito.
A. Designated Uses: irrigation, livestock watering, wildlife habitat, coldwater aquatic life, warmwater aquatic life and ~~secondary~~ primary contact.
B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criterion applies: temperature 31°C (87.8°F) or less.
[20.6.4.116 NMAC - Rp 20 NMAC 6.1.2113, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]]

BASIS FOR CHANGE: The word 'below' is replaced with the hydrologic term 'downstream of' in the segment description. Based on a survey conducted by the Department during 2012, this segment has an existing use of primary contact. This segment includes Rio Ojo Caliente, and the Ohkay Owingeh surface water quality standards downstream are assigned the primary contact recreation use. The Rio Grande at the confluence is also designated as primary contact recreation. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29,

2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.117 – 20.6.4.123 – No changes proposed.

20.6.4.124 RIO GRANDE BASIN - Perennial reaches of Sulphur creek from ~~its headwaters to~~ its confluence with Redondo creek upstream to its headwaters.

A. Designated Uses: limited aquatic life, wildlife habitat, livestock watering and ~~secondary~~ primary contact.

B. Criteria: the use-specific criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: pH within the range of 2.0 to 9.0, maximum temperature 30ºC (86ºF), and the chronic aquatic life criteria of Subsections I and J of 20.6.4.900 NMAC.

[20.6.4.124 NMAC - N, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The wording in the segment description is changed to more accurately describe the reach in hydrologic terms from the downstream confluence upstream to its headwaters. Also, surveys have been conducted by the Department during 2003 and 2013. During the 2013 survey, it was observed that this segment has an existing use of primary contact. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.125 – 20.6.4.203 – No changes proposed.

20.6.4.204 PECOS RIVER BASIN - The main stem of the Pecos river from the headwaters of Avalon reservoir upstream to Brantley dam.

A. Designated Uses: irrigation, livestock watering, wildlife habitat, ~~secondary~~ primary contact and warmwater aquatic life.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.

[20.6.4.204 NMAC - Rp 20 NMAC 6.1.2204, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

[**NOTE:** The segment covered by this section was divided effective 05-23-05. The standards for Avalon Reservoir are under 20.6.4.219 NMAC.]

BASIS FOR CHANGE: Surveys were conducted by the Department during 2003 and 2013; this area is accessible for fishing, boating and other recreation activities. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect

those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.205 PECOS RIVER BASIN - Brantley reservoir.

A. Designated Uses: irrigation storage, livestock watering, wildlife habitat, primary contact and warmwater aquatic life.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.

[20.6.4.205 NMAC - Rp 20 NMAC 6.1.2205, 10-12-00; A, 05-23-05; A, 12-01-10]

20.6.4.206 PECOS RIVER BASIN - The main stem of the Pecos river from the headwaters of Brantley reservoir upstream to Salt creek (near Acme), perennial reaches of the Rio Peñasco downstream from state highway 24 near Dunken, perennial reaches of the Rio Hondo and its tributaries ~~below~~ downstream of Bonney canyon and perennial reaches of the Rio Felix.

A. Designated Uses: irrigation, livestock watering, wildlife habitat, ~~secondary~~ primary contact and warmwater aquatic life.

B. Criteria:

(1) The use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.

(2) At all flows above 50 cfs: TDS 14,000 mg/L or less, sulfate 3,000 mg/L or less and chloride 6,000 mg/L or less.

[20.6.4.206 NMAC - Rp 20 NMAC 6.1.2206, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The word 'below' is replaced with the hydrologic term 'downstream of' in the segment description. Surveys conducted by the Department during 2004 and 2013 documented access to the Rio Peñasco, which also has sites noted for fishing and other recreational activities. Brantley Reservoir (downstream water body) is classified as primary contact use and criteria. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.207 PECOS RIVER BASIN - The main stem of the Pecos river from Salt creek (near Acme) upstream to Sumner dam.

A. Designated Uses: irrigation, marginal warmwater aquatic life, livestock watering, wildlife habitat and ~~secondary~~ primary contact.

B. Criteria:

(1) The use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.

(2) At all flows above 50 cfs: TDS 8,000 mg/L or less, sulfate 2,500 mg/L or less and chloride 4,000 mg/L or less.

[20.6.4.207 NMAC - Rp 20 NMAC 6.1.2207, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: Surveys have been conducted by the Department during 2005 and 2013. During the 2013 survey, it was observed this segment has an existing use of primary contact. While access is difficult in very remote locations, it can be accomplished. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.208 – 20.6.4.212 – No changes proposed.

20.6.4.213 PECOS RIVER BASIN - McAllister lake.

A. Designated Uses: coldwater aquatic life, ~~secondary~~ primary contact, livestock watering and wildlife habitat.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criterion applies: temperature 25°C (77°F) or less.

[20.6.4.213 NMAC - Rp 20 NMAC 6.1.2211.3, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The lake is a state park and national wildlife refuge. The area is open for boating, fishing and camping activities in the spring, summer and fall. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.214 – 20.6.4.218 – No changes proposed.

20.6.4.219 PECOS RIVER BASIN - Avalon reservoir.

A. Designated Uses: irrigation storage, livestock watering, wildlife habitat, ~~secondary~~ primary contact and warmwater aquatic life.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.

[20.6.4.219 NMAC - N, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: Kayaking and scuba for game fishing are activities allowed and described on the reservoir park website. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.220 – 20.6.4.304 – No changes proposed.

20.6.4.305 CANADIAN RIVER BASIN - The main stem of the Canadian river from the headwaters of Conchas reservoir upstream to the New Mexico-Colorado line, perennial reaches of the Conchas river, the Mora river downstream from the USGS gaging station near Shoemaker, the Vermejo river downstream from Rail canyon and perennial reaches of Raton, Chicorica (except Lake Maloya and Lake Alice) and Uña de Gato creeks.

A. Designated Uses: irrigation, marginal warmwater aquatic life, livestock watering, wildlife habitat and primary contact.

B. Criteria:

(1) The use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.

(2) TDS 3,500 mg/L or less at flows above 10 cfs.

[20.6.4.305 NMAC - Rp 20 NMAC 6.1.2305, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

[**NOTE:** This segment was divided effective 12-01-10. The standards for ~~Lake Maloya and~~ Lake Alice and Lake Maloya are under 20.6.4.311 and 20.6.4.312 NMAC, respectively.]

BASIS FOR CHANGE: Grammatical correction/edit.

20.6.4.306 – 20.6.4.307 – No changes proposed.

20.6.4.308 CANADIAN RIVER BASIN - Charette lakes.

A. Designated Uses: coldwater aquatic life, warmwater aquatic life, ~~secondary~~ primary contact, livestock watering and wildlife habitat.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.
[20.6.4.308 NMAC - Rp 20 NMAC 6.1.2305.5, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: Charette Lake is a state park with access for fishing, swimming or other primary contact activities. The State is required, from time to time or at least every three years such as during the Triennial Review, to regularly conduct an evaluation of all water bodies with uses not consistent with CWA Section 101(a) goals and if new information indicates the goals are attainable, revise its standards to reflect those uses (40 CFR 131.20). The Department has no evidence that this use is not attainable and information provided above would indicate that primary contact use is existing and likely attainable. To be consistent with the latest EPA recommendations for recreational contact and CWA 101(a) goals (77 FR71191, November 29, 2012), the designated use for secondary contact is upgraded to the primary contact use with corresponding criteria.

20.6.4.309 – 20.6.4.316 – No changes proposed.

20.6.4.317 CANADIAN RIVER BASIN - Springer lake.

A. Designated Uses: coolwater aquatic life, irrigation, primary contact, livestock watering, ~~and~~ wildlife habitat, and public water supply.

B. Criteria: The use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses.
[20.6.4.317 NMAC - N, 07-10-12; A, XX-XX-XX]

BASIS FOR CHANGE: Springer Lake is a public water supply for Colfax County (Water System Number NM3526604) and this designated use is an existing use that is proposed be added to the water body segment description.

20.6.4.318 - 20.6.4.400: [RESERVED]

20.6.4.401 SAN JUAN RIVER BASIN - The main stem of the San Juan river from the Navajo Nation boundary at the Hogback upstream to its confluence with the Animas river. Some waters in this segment are under the joint jurisdiction of the state and the Navajo Nation.

A. Designated Uses: public water supply, industrial water supply, irrigation, livestock watering, wildlife habitat, primary contact, marginal coldwater aquatic life and warmwater aquatic life.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criterion applies: temperature 32.2°C (90°F) or less.
[20.6.4.401 NMAC - Rp 20 NMAC 6.1.2401, 10-12-00; A, 05-23-05; A, 12-01-10]
[**NOTE:** The segment covered by this section was divided effective 05-23-05. The standards for the additional segment are under 20.6.4.408 NMAC.]

20.6.4.402 SAN JUAN RIVER BASIN - La Plata river from its confluence with the San Juan river upstream to the New Mexico-Colorado line.

A. Designated Uses: irrigation, marginal warmwater aquatic life, marginal coldwater aquatic life, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criterion applies: temperature 32.2°C (90°F) or less.

[20.6.4.402 NMAC - Rp 20 NMAC 6.1.2402, 10-12-00; A, 05-23-05; A, 12-01-10]

20.6.4.403 SAN JUAN RIVER BASIN - The Animas river from its confluence with the San Juan river upstream to Estes Arroyo.

A. Designated Uses: public water supply, industrial water supply, irrigation, livestock watering, wildlife habitat, ~~marginal coldwater~~ coolwater aquatic life, and primary contact ~~and warmwater aquatic life~~.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses~~.~~, except that the following segment-specific criterion applies: temperature 27°C (80.6°F) or less.

[20.6.4.403 NMAC - Rp 20 NMAC 6.1.2403, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The word 'river' is added in the segment description. Changes shown to the aquatic life uses and temperature criteria to the lower Animas River are supported by a draft UAA *Aquatic Life Uses for the Animas River in New Mexico* posted on the Department's website for public comment on November 20, 2013; a public meeting was held on December 17, 2013. After consideration of public comments, the draft UAA and responses to comments will be submitted to EPA for technical approval. Once technically approved by EPA, the UAA and recommended changes will be submitted to the Commission (WQCC) for approval and adoption into the water quality standards. The Department will submit the UAA, standards revisions and relative supporting documentation to EPA for final approval under Clean Water Act Section 303(c). Depending on the timing, these actions may be concurrent with the Triennial review process.

20.6.4.404 SAN JUAN RIVER BASIN - The Animas river from Estes Arroyo upstream to the ~~New Mexico-Colorado line~~ Southern Ute Indian tribal boundary.

A. Designated Uses: ~~coldwater~~coolwater aquatic life, irrigation, livestock watering, wildlife habitat, public water supply, industrial water supply and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criterion applies: phosphorus (unfiltered sample) 0.l mg/L or less.

[20.6.4.404 NMAC - Rp 20 NMAC 6.1.2404, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The segment description is corrected to reflect the jurisdictional boundary with the Southern Ute Indian Tribe. The aquatic life use change to the upper Animas River is supported by a draft UAA *Aquatic Life Uses for the Animas River in New Mexico* which was posted on the Department's website for public comment on November 20, 2013; a public

meeting was held on December 17, 2013. After consideration of public comments, the draft UAA and responses to comments will be submitted to EPA for technical approval. Once technically approved by EPA, the UAA and recommended changes will be submitted to the Commission (WQCC) for approval and adoption into the water quality standards. The Department will submit the UAA, standards revisions and relative supporting documentation to EPA for final approval under Clean Water Act Section 303(c). Depending on the timing, these actions may be concurrent with the Triennial review process.

20.6.4.405 – 20.6.4.502 – No changes proposed.

20.6.4.502 GILA RIVER BASIN - The main stem of the Gila river from Redrock canyon upstream to the confluence of the West Fork Gila river and East Fork Gila river and perennial reaches of tributaries to the Gila river ~~below~~ downstream of Mogollon creek.

A. Designated Uses: industrial water supply, irrigation, livestock watering, wildlife habitat, marginal coldwater aquatic life, primary contact and warmwater aquatic life.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criterion applies: 28°C (82.4°F) or less.

[20.6.4.502 NMAC - Rp 20 NMAC 6.1.2502, 10-12-00; A, 05-23-05; A, 12-01-10]

BASIS FOR CHANGE: The word 'below' is replaced with the hydrologic term 'downstream of' in the segment description.

20.6.4.503 GILA RIVER BASIN - All perennial tributaries to the Gila river ~~above~~ upstream of, and including, Mogollon creek.

A. Designated Uses: domestic water supply, high quality coldwater aquatic life, irrigation, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: specific conductance of 400 µS/cm or less for all perennial tributaries except West Fork Gila and perennial tributaries thereto, specific conductance of 300 µS/cm or less.; 32.2°C (90°F) or less in the east fork of the Gila river and Sapillo creek ~~below~~ downstream of Lake Roberts; the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

[20.6.4.503 NMAC - Rp 20 NMAC 6.1.2503, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The words 'above' and 'below' are replaced with the hydrological terms 'upstream of' and 'downstream of', respectively. A correction is also necessary to the description for the portion of the Gila River system with segment specific criteria assigned in Subsection B of 20.6.4.503 NMAC. The section of the Gila River referred to as the "main stem of the Gila River above the Gila Hot Springs" is actually the West Branch (or West Fork) Gila River. The main stem of the Gila River begins from the confluence of the West and East Forks of the Gila River, and extends downstream from the confluence. An analysis of specific conductivity in the reaches was also conducted and supports this correction.

20.6.4.504 – 20.6.4.802 – No changes proposed.

20.6.4.803 CLOSED BASINS - Perennial reaches of the Mimbres river downstream of the confluence with ~~Willow Springs~~ Allie canyon and all perennial reaches of tributaries thereto.

A. Designated Uses: ~~coldwater~~ coolwater aquatic life with a segment-specific temperature of 30°C, irrigation, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

[20.6.4.803 NMAC - Rp 20 NMAC 6.1.2803, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

20.6.4.804 CLOSED BASINS - Perennial reaches of the Mimbres river upstream of the confluence with ~~Willow Springs~~ Allie canyon upstream to Cooney canyon, and all perennial reaches of East Fork Mimbres (McKnight canyon) below the fish barrier, and all perennial tributaries thereto.

A. Designated Uses: irrigation, domestic water supply, ~~high quality~~ coldwater aquatic life, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: specific conductance 300 µS/cm or less; the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

[20.6.4.804 NMAC - Rp 20 NMAC 6.1.2804, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

20.6.4.805 – 20.6.4.806 – No changes proposed.

20.6.4.807 CLOSED BASINS - Perennial reaches of the Mimbres river upstream of Cooney Canyon and all perennial reaches thereto, including perennial reaches of East Fork Mimbres river (McKnight Canyon) above the fish barrier.

A. Designated Uses: irrigation, domestic water supply, high quality coldwater aquatic life, livestock watering, wildlife habitat and primary contact.

[20.6.4.807 NMAC – N, XX-XX-XX]

BASIS FOR CHANGE: A draft UAA indicating changes to aquatic life designated uses and criteria for segments 20.6.4.803 NMAC, 20.6.4.804 NMAC and addition of a new segment 20.6.4.807 NMAC is part of this Triennial Review discussion draft. The draft UAA study recommends that Cooney Canyon to the headwaters of the Mimbres River including all perennial tributaries from the 23d ecoregion (Subalpine forests) should remain designated as high quality coldwater aquatic life use. A new segment extending from Allie Canyon to Cooney Canyon (the "Middle Mimbres") should be designated as coldwater aquatic life use and a segment from Allie Canyon to the mouth designated as coolwater aquatic life use.

After consideration of public comments, the draft UAA and responses to comments will be submitted to EPA for technical approval. Once technically approved by EPA, the UAA and recommended changes will be submitted to the Commission (WQCC) for approval and adoption into the water quality standards. The Department will submit the UAA, standards revisions and relative supporting documentation to EPA for final approval under Clean Water Act Section 303(c). Depending on the timing, these actions may or may not be concurrent with the Triennial review process.

20.6.4.807 - 20.6.4.899: [RESERVED]

20.6.4.900 CRITERIA APPLICABLE TO EXISTING, DESIGNATED OR ATTAINABLE USES UNLESS OTHERWISE SPECIFIED IN 20.6.4.97 THROUGH 20.6.4.899 NMAC.

A. Fish Culture and Water Supply: Fish culture, public water supply and industrial water supply are designated uses in particular classified waters of the state where these uses are actually being realized. However, no numeric criteria apply uniquely to these uses. Water quality adequate for these uses is ensured by the general criteria and numeric criteria for bacterial quality, pH and temperature.

BASIS FOR CHANGE: Correction of a minor typographical error requires inserting a space between the word 'Culture' and the word 'and.'

Subsection B, 20.6.4.900 –Subsection C, 20.6.4.900 – No changes proposed.

D. Primary Contact: the monthly geometric mean of E. coli bacteria of 126 cfu/100 mL or MPN/100 ml and single sample of 410 cfu/100 mL or MPN/100 mL and pH within the range of 6.6 to 9.0 apply to this use. The results for *E. coli* may be reported as either cfu (colony forming units) or the most probable number (MPN) as appropriate based on the test method used.

E. Secondary Contact: the monthly geometric mean of E. coli bacteria of 548 cfu/100 mL or MPN/100 mL and single sample of 2507 cfu/100 mL or MPN/100 mL apply to this use. The results for *E. coli* may be reported as either cfu (colony forming units) or the most probable number (MPN) as appropriate based on the test method used.

BASIS FOR CHANGE: EPA Region 6 has requested that the state's water quality standards and TMDL guidance refer to use of both colony forming units (cfu) and most probable number (MPN). The use of more cost-effective and time efficient methods in which counts are expressed as MPN/100 ml was approved by EPA for testing ambient waters in 2003[1] and for wastewater and sewage sludge in 2007[2]. The SWQB is currently using an approved EPA method for sampling and analyzing bacteria levels in ambient water and which reports results in MPN/100 ml. The currently recommended EPA recreational or bacteria criteria for *E. coli* are expressed as cfu/100 ml measured using *EPA Method 1603* or any other equivalent method that measures

[1] *U.S. Federal Register* - 40 CFR Part 136 Vol. 68, No. 139; July 21, 2003.
[2] *U.S. Federal Register* - 40 CFR Parts 136 and 503, Vol. 72, No. 157; March 26, 2007.

culturable *E. coli* [3,4]. Therefore, the water quality standards are proposed to be revised to reflect the use of updated methods for monitoring, assessment and reporting. References for EPA Method 1603 and EPA's final rules establishing alternate test procedures may be included in 20.6.4.901 NMAC as references.

Subsection F through Subsection H, Subparagraph (1) of 20.6.4.900 – No changes proposed.

(2) Coldwater: dissolved oxygen 6.0 mg/L or more, 6T3 temperature 20°C (68°F), maximum temperature 24°C (75°F) and pH within the range of 6.6 to 8.8. Where a single segment-specific temperature criterion is indicated in 20.6.4.101-899 NMAC, it is the maximum temperature and no 6T3 temperature applies.

(3) Marginal Coldwater: dissolved oxygen 6.0 mg/L or more, 6T3 temperature 25°C (77°F), maximum temperature 29°C (84°F) and pH within the range from 6.6 to 9.0. Where a single segment-specific temperature criterion is indicated in 20.6.4.101-899 NMAC, it is the maximum temperature and no 6T3 temperature applies.

(4) Coolwater: dissolved oxygen 5.0 mg/L or more, maximum temperature 29°C (84°F) and pH within the range of 6.6 to 9.0.

(5) Warmwater: dissolved oxygen 5.0 mg/L or more, maximum temperature 32.2°C (90°F) and pH within the range of 6.6 to 9.0. Where a segment-specific temperature criterion is indicated in 20.6.4.101-899 NMAC, it is the maximum temperature.

(6) Marginal Warmwater: dissolved oxygen 5.0 mg/L or more, pH within the range of 6.6 to 9.0 and maximum temperature 32.2°C (90°F). Where a segment-specific temperature criterion is indicated in 20.6.4.101-899 NMAC, it is the maximum temperature.

BASIS FOR CHANGE: Dissolved oxygen criteria are revised to show decimal places in Subsection H, subparagraphs (3), (5) and (6) of 20.6.4 NMAC, consistent with dissolved oxygen criteria for the other aquatic life designated uses.

(7) Limited Aquatic Life: The acute aquatic life criteria of Subsections I and J of this section apply to this subcategory. Chronic aquatic life criteria do not apply unless adopted on a segment-specific basis. Human health-organism only criteria apply only for persistent pollutants unless adopted on a segment-specific basis.

I. Hardness-dependent acute and chronic aquatic life criteria for metals are calculated using the following equations. The criteria are expressed as a function of dissolved hardness (as mg $CaCO_3$/L). With the exception of aluminum, the equations are valid only for dissolved hardness concentrations of 0-400 mg/L. For dissolved hardness concentrations above 400 mg/L, the criteria for 400 mg/L apply. For aluminum the equations are valid only for dissolved hardness concentrations of 0-220 mg/L. For dissolved hardness concentrations above 220 mg/L, the aluminum criteria for 220 mg/L apply.

[3] EPA, 2012: http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/upload/factsheet2012.pdf
[4] USEPA. 2002. Method 1603: *Escherichia coli* (*E. coli*) In Water By Membrane Filtration Using Modified membrane-Thermotolerant *Escherichia coli* Agar (modified mTEC). U.S. Environmental Protection Agency, Office of Water, Washington D.C. EPA–821–R–02–023.

(1) Acute aquatic life criteria for metals. The equation to calculate acute criteria in µg/L is $\exp(m_A[\ln(\text{hardness})] + b_A)(CF)$. Except for aluminum, the criteria are based on analysis of dissolved metal. For aluminum, the criteria are based on analysis of total recoverable aluminum in a sample that is filtered to minimize mineral phases as specified by the department. EPA approved the hardness-based equation for total recoverable aluminum as applicable only where pH is equal to or greater than 6.5 in the receiving stream after mixing. When pH is less than 6.5 in the receiving stream after mixing, the applicable acute criteria for aluminum are as indicated in the table of numeric criteria found in subsection J. The equation parameters are as follows:

BASIS FOR CHANGE: EPA approved the revised hardness-based formulae and criteria for chromium III, copper, lead, manganese, nickel and silver, aluminum, cadmium and zinc adopted during the 2009 Triennial Revision. However, for aluminum, EPA did not approve the acute and chronic hardness-based criteria for waters with a pH below 6.5 and recommended the state adopt the exception into its water quality standards. For clarity of implementation, the Department is proposing to incorporate EPA's decision for acute aluminum criteria during this Triennial revision.

Metal	**m_A**	**b_A**	**Conversion factor (CF)**
Aluminum (Al)	1.3695	1.8308	
Cadmium (Cd)	0.8968	-3.5699	1.136672-[(ln hardness)(0.041838)]
Chromium (Cr) III	0.8190	3.7256	0.316
Copper (Cu)	0.9422	-1.700	0.960
Lead (Pb)	1.273	-1.460	1.46203-[(ln hardness)(0.145712)]
Manganese (Mn)	0.3331	6.4676	
Nickel (Ni)	0.8460	2.255	0.998
Silver (Ag)	1.72	-6.59	0.85
Zinc (Zn)	0.9094	0.9095	0.978

(2) Chronic aquatic life criteria for metals. The equation to calculate chronic criteria in µg/L is $\exp(m_C[\ln(\text{hardness})] + b_C)(CF)$. Except for aluminum, the criteria are based on analysis of dissolved metal. For aluminum, the criteria are based on analysis of total recoverable aluminum in a sample that is filtered to minimize mineral phases as specified by the department. EPA approved the hardness-based equation for total recoverable aluminum as applicable only where the pH is equal to or greater than 6.5 in the receiving stream after mixing. When the pH is less than 6.5 in the receiving stream after mixing, the applicable chronic criteria for aluminum are as indicated in the table of numeric criteria found in subsection J. The equation parameters are as follows:

BASIS FOR CHANGE: EPA approved the revised hardness-based criteria for chromium III, copper, lead, manganese, nickel and silver, aluminum, cadmium and zinc in Subsection **20.6.4.900 I. (1)-(2) NMAC** that were adopted during the 2009 Triennial Revision. However, for aluminum, EPA did not approve the acute and chronic hardness-based criteria for waters with a pH below 6.5 and recommended the state adopt the exception into its water quality standards.

For clarity of implementation, the Department is proposing to incorporate EPA's decision for chronic aluminum criteria during this Triennial revision.

Metal	**m_C**	**b_C**	**Conversion factor (CF)**
Aluminum (Al)	1.3695	0.9161	
Cadmium (Cd)	0.7647	-4.2180	1.101672-[(ln hardness)(0.041838)]
Chromium (Cr) III	0.8190	0.6848	0.860
Copper (Cu)	0.8545	-1.702	0.960
Lead (Pb)	1.273	-4.705	1.46203-[(ln hardness)(0.145712)]
Manganese (Mn)	0.3331	5.8743	
Nickel (Ni)	0.8460	0.0584	0.997
Zinc (Zn)	0.9094	0.6235	0.986

(3) Selected values of calculated acute and chronic criteria (µg/L).

Hardness as $CaCO_3$, dissolved (mg/L)		Al	Cd	Cr III	Cu	Pb	Mn	Ni	Ag	Zn
25	Acute	512	0.51	180	4	14	1,881	140	0.3	45
	Chronic	205	0.17	24	3	1	1,040	16		34
30	Acute	658	0.59	210	4	17	1,999	170	0.4	54
	Chronic	263	0.19	28	3	1	1,105	19		41
40	Acute	975	0.76	270	6	24	2,200	220	0.7	70
	Chronic	391	0.23	35	4	1	1,216	24		53
50	Acute	1,324	0.91	320	7	30	2,370	260	1.0	85
	Chronic	530	0.28	42	5	1	1,309	29		65
60	Acute	1,699	1.07	370	8	37	2,519	300	1.3	101
	Chronic	681	0.31	49	6	1	1,391	34		76
70	Acute	2,099	1.22	430	10	44	2,651	350	1.7	116
	Chronic	841	0.35	55	7	2	1,465	38		88
80	Acute	2,520	1.37	470	11	51	2,772	390	2.2	131
	Chronic	1,010	0.39	62	7	2	1,531	43		99
90	Acute	2,961	1.51	520	12	58	2,883	430	2.7	145
	Chronic	1,186	0.42	68	8	2	1,593	48		110
100	Acute	3,421	1.65	570	13	65	2,986	470	3.2	160
	Chronic	1,370	0.45	74	9	3	1,650	52		121
200	Acute	8,838	2.98	1,010	26	140	3,761	840	11	301
	Chronic	3,541	0.75	130	16	5	2,078	90		228
220	Acute	10,071	3.23	1,087	28	151	3,882	912	13	328
	Chronic	4,035	0.80	141	18	6	2,145	101		248
300	Acute	10,071	4.21	1,400	38	210	4,305	1190	21	435

Hardness as $CaCO_3$, dissolved (mg/L)		Al	Cd	Cr III	Cu	Pb	Mn	Ni	Ag	Zn
	Chronic	4,035	1.00	180	23	8	2,379	130		329
400 and above	Acute	10,071	5.38	1,770	50	280	4,738	1510	35	564
	Chronic	4,035	1.22	230	29	11	2,618	170		428

BASIS FOR CHANGE: The table in Subsection I, Subparagraph (3) of 20.6.4.900 (above) is revised to add the subscript '3' to the chemical nomenclature for hardness, and to include the missing calculated values for metals at hardness of 220 mg/L $CaCO_3$.

J. Use-Specific Numeric criteria.

~~**(1)** Notes applicable to the table of numeric criteria in Paragraph (2) of this subsection.~~

~~**(a)** Where the letter "a" is indicated in a cell, the criterion is hardness-based and can be referenced in Subsection I of 20.6.4.900 NMAC.~~

~~**(b)** Where the letter "b" is indicated in a cell, the criterion can be referenced in Subsection C of 20.6.4.900 NMAC.~~

~~**(c)** Criteria are in µg/L unless otherwise indicated.~~

~~**(d)** Abbreviations are as follows: CAS - chemical abstracts service (see definition for "CAS number" in 20.6.4.7 NMAC); DWS - domestic water supply; Irr - irrigation; LW - livestock watering; WH - wildlife habitat; HH-OO - human health-organism only; C - cancer-causing; P - persistent.~~

~~**(e)** The criteria are based on analysis of an unfiltered sample unless otherwise indicated. The acute and chronic aquatic life criteria for aluminum are based on analysis of total recoverable aluminum in a sample that is filtered to minimize mineral phases as specified by the department.~~ For aluminum, ~~where the pH is 6.5 or less in the receiving water after mixing, the acute and chronic dissolved criteria in the table will apply.~~

~~**(f)** The criteria listed under human health-organism only (HH-OO) are intended to protect human health when aquatic organisms are consumed from waters containing pollutants. These criteria do not protect the aquatic life itself; rather, they protect the health of humans who ingest fish or other aquatic organisms.~~

~~**(g)** The dioxin criteria apply to the sum of the dioxin toxicity equivalents expressed as 2,3,7,8-TCDD dioxin.~~

~~**(h)** The criteria for polychlorinated biphenyls (PCBs) applies to the sum of all congeners, to the sum of all homologs or to the sum of all aroclors.~~

BASIS FOR CHANGE: The order of Subsection J, subparagraphs J(1) and J(2) are transposed so the table precedes the explanatory notes.

(~~2~~1) Table of Numeric Criteria: The following table sets forth the numeric criteria applicable to existing, designated and attainable uses. For metals, criteria represent the total sample fraction unless otherwise specified in the table. Additional criteria that are not compatible with this table are found in Subsections A through I, K and L of this section.

BASIS FOR CHANGES: As noted in the previous section, the order of Subsection J, subparagraphs J(1) and J(2) are transposed so the table of numeric criteria precedes the explanatory notes. Language is added to the new section Subsection J, Subparagraph (1) of 20.6.4.900 (above) to clarify that criteria for metals are based on the total sample fraction unless otherwise specified (e.g., dissolved). Consistent with the definitions in Subsection I, subparagraph (I)(5) in 20.6.4.7 NMAC, the irrigation storage designated use (e.g., Irr Storage) is added to the table column headings below. Also, a hyphen is added to the Chemical Abstracts Service registry number (CAS number) for Bis(2-ethylhexyl) phthalate to correct a typographical error in the table below.

Pollutant	CAS Number	DWS	Irr/Irr Storage	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
Aluminum, dissolved	7429-90-5		5,000			750 e	87 e		
Aluminum, total recoverable	7429-90-5					a, e	a, e		
Antimony, dissolved	7440-36-0	6						640	P
Arsenic, dissolved	7440-38-2	10	100	200		340	150	9.0	C,P
Asbestos	1332-21-4	7,000,000 fibers/L							
Barium, dissolved	7440-39-3	2,000							
Beryllium, dissolved	7440-41-7	4							
Boron, dissolved	7440-42-8		750	5,000					
Cadmium, dissolved	7440-43-9	5	10	50		a	a		
Chlorine residual	7782-50-5				11	19	11		
Chromium III, dissolved	16065-83-1					a	a		
Chromium VI, dissolved	18540-29-9					16	11		
Chromium, dissolved	7440-47-3	100	100	1,000					
Cobalt, dissolved	7440-48-4		50	1,000					
Copper, dissolved	7440-50-8	1300	200	500		a	a		
Cyanide, total recoverable	57-12-5	200			5.2	22.0	5.2	140	
Lead, dissolved	7439-92-1	15	5,000	100		a	a		
Manganese, dissolved	7439-96-5					a	a		
Mercury	7439-97-6	2		10	0.77				
Mercury, dissolved	7439-97-6					1.4	0.77		
Methylmercury	22967-92-6							0.3 mg/kg in fish tissue	P
Molybdenum, dissolved	7439-98-7		1,000						
Molybdenum, total recoverable	7439-98-7					7,920	1,895		
Nickel, dissolved	7440-02-0	700				a	a	4,600	P
Nitrate as N		10 mg/L							
Nitrite + Nitrate				132 mg/L					
Selenium, dissolved	7782-49-2	50	b	50				4,200	P

Pollutant	CAS Number	DWS	Irr/Irr Storage	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
Selenium, total recoverable	7782-49-2				5.0	20.0	5.0		
Silver, dissolved	7440-22-4					a			
Thallium, dissolved	7440-28-0	2						0.47	P
Uranium, dissolved	7440-61-1	30							
Vanadium, dissolved	7440-62-2		100	100					
Zinc, dissolved	7440-66-6	10,500	2,000	25,000		a	a	26,000	P
Adjusted gross alpha		15 pCi/L		15 pCi/L					
Radium 226 + Radium 228		5 pCi/L		30.0 pCi/L					
Strontium 90		8 pCi/L							
Tritium		20,000 pCi/L		20,000 pCi/L					
Acenaphthene	83-32-9	2,100						990	
Acrolein	107-02-8	18						9	
Acrylonitrile	107-13-1	0.65						2.5	C
Aldrin	309-00-2	0.021				3.0		0.00050	C,P
Anthracene	120-12-7	10,500						40,000	
Benzene	71-43-2	5						510	C
Benzidine	92-87-5	0.0015						0.0020	C
Benzoaanthracene	56-55-3	0.048						0.18	C
Benzoapyrene	50-32-8	0.2						0.18	C,P
Benzo(b)fluoranthene	205-99-2	0.048						0.18	C
Benzo(k)fluoranthene	207-08-9	0.048						0.18	C
alpha-BHC	319-84-6	0.056						0.049	C
beta-BHC	319-85-7	0.091						0.17	C
Gamma-BHC (Lindane)	58-89-9	0.20				0.95		1.8	
Bis(2-chloroethyl) ether	111-44-4	0.30						5.3	C
Bis(2-chloroisopropyl) ether	108-60-1	1,400						65,000	
Bis(2-ethylhexyl) phthalate	117-81-7	6						22	C
Bromoform	75-25-2	44						1,400	C

Pollutant	CAS Number	DWS	Irr/Irr Storage	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
Butylbenzyl phthalate	85-68-7	7,000						1,900	
Carbon tetrachloride	56-23-5	5						16	C
Chlordane	57-74-9	2				2.4	0.0043	0.0081	C,P
Chlorobenzene	108-90-7	100						1,600	
Chlorodibromomethane	124-48-1	4.2						130	C
Chloroform	67-66-3	57						4,700	C
2-Chloronaphthalene	91-58-7	2,800						1,600	
2-Chlorophenol	95-57-8	175						150	
Chrysene	218-01-9	0.048						0.18	C
Diazinon	333-41-5					0.17	0.17		
4,4'-DDT and derivatives		1.0			0.001	1.1	0.001	0.0022	C,P
Dibenzo(a,h)anthracene	53-70-3	0.048						0.18	C
Dibutyl phthalate	84-74-2	3,500						4,500	
1,2-Dichlorobenzene	95-50-1	600						1,300	
1,3-Dichlorobenzene	541-73-1	469						960	
1,4-Dichlorobenzene	106-46-7	75						190	
3,3'-Dichlorobenzidine	91-94-1	0.78						0.28	C
Dichlorobromomethane	75-27-4	5.6						170	C
1,2-Dichloroethane	107-06-2	5						370	C
1,1-Dichloroethylene	75-35-4	7						7,100	C
2,4-Dichlorophenol	120-83-2	105						290	
1,2-Dichloropropane	78-87-5	5.0						150	C
1,3-Dichloropropene	542-75-6	3.5						210	C
Dieldrin	60-57-1	0.022				0.24	0.056	0.00054	C,P
Diethyl phthalate	84-66-2	28,000						44,000	
Dimethyl phthalate	131-11-3	350,000						1,100,000	
2,4-Dimethylphenol	105-67-9	700						850	
2,4-Dinitrophenol	51-28-5	70						5,300	
2,4-Dinitrotoluene	121-14-2	1.1						34	C
Dioxin		3.0E-05						5.1E-08	C,P
1,2-Diphenylhydrazine	122-66-7	0.44						2.0	C
alpha-Endosulfan	959-98-8	62				0.22	0.056	89	

Pollutant	CAS Number	DWS	Irr/Irr Storage	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
beta-Endosulfan	33213-65-9	62				0.22	0.056	89	
Endosulfan sulfate	1031-07-8	62						89	
Endrin	72-20-8	2				0.086	0.036	0.060	
Endrin aldehyde	7421-93-4	10.5						0.30	
Ethylbenzene	100-41-4	700						2,100	
Fluoranthene	206-44-0	1,400						140	
Fluorene	86-73-7	1,400						5,300	
Heptachlor	76-44-8	0.40				0.52	0.0038	0.00079	C
Heptachlor epoxide	1024-57-3	0.20				0.52	0.0038	0.00039	C
Hexachlorobenzene	118-74-1	1						0.0029	C,P
Hexachlorobutadiene	87-68-3	4.5						180	C
Hexachlorocyclopen-tadiene	77-47-4	50						1,100	
Hexachloroethane	67-72-1	25						33	C
Ideno(1,2,3-cd)pyrene	193-39-5	0.048						0.18	C
Isophorone	78-59-1	368						9,600	C
Methyl bromide	74-83-9	49						1,500	
2-Methyl-4,6-dinitrophenol	534-52-1	14						280	
Methylene chloride	75-09-2	5						5,900	C
Nitrobenzene	98-95-3	18						690	
N-Nitrosodimethylamine	62-75-9	0.0069						30	C
N-Nitrosodi-n-propylamine	621-64-7	0.050						5.1	C
N-Nitrosodiphenylamine	86-30-6	71						60	C
Nonylphenol	84852-15-3					28	6.6		
Polychlorinated Byphenyls (PCBs)	1336-36-3	0.50			0.014	2	0.014	0.00064	C,P
Pentachlorophenol	87-86-5	1.0				19	15	30	C
Phenol	108-95-2	10,500						860,000	
Pyrene	129-00-0	1,050						4,000	
1,1,2,2-Tetrachloroethane	79-34-5	1.8						40	C
Tetrachloroethylene	127-18-4	5						33	C,P

Pollutant	CAS Number	DWS	Irr/Irr Storage	LW	WH	Aquatic Life			Type
						Acute	Chronic	HH-OO	
Toluene	108-88-3	1,000						15,000	
Toxaphene	8001-35-2	3				0.73	0.0002	0.0028	C
1,2-Trans-dichloroethylene	156-60-5	100						10,000	
1,2,4-Trichlorobenzene	120-82-1	70						70	
1,1,1-Trichloroethane	71-55-6	200							
1,1,2-Trichloroethane	79-00-5	5						160	C
Trichloroethylene	79-01-6	5						300	C
2,4,6-Trichlorophenol	88-06-2	32						24	C
Vinyl chloride	75-01-4	2						24	C

(~~1~~2) Notes applicable to the table of numeric criteria in Paragraph (~~2~~1) of this subsection.

(a) Where the letter "a" is indicated in a cell, the criterion is hardness-based and can be referenced in Subsection I of 20.6.4.900 NMAC.

(b) Where the letter "b" is indicated in a cell, the criterion can be referenced in Subsection C of 20.6.4.900 NMAC.

(c) Criteria are in µg/L unless otherwise indicated.

(d) Abbreviations are as follows: CAS - chemical abstracts service (see definition for "CAS number" in 20.6.4.7 NMAC); DWS - domestic water supply; Irr/Irr Storage-irrigation or irrigation storage; LW - livestock watering; WH - wildlife habitat; HH-OO - human health-organism only; C - cancer-causing; P - persistent.

(e) The criteria are based on analysis of an unfiltered sample unless otherwise indicated. The acute and chronic aquatic life criteria for aluminum are based on analysis of total recoverable aluminum in a sample that is filtered to minimize mineral phases as specified by the department. For aluminum, where the pH is 6.5 or less in the receiving water after mixing, the acute and chronic dissolved criteria in the table will apply.

(f) The criteria listed under human health-organism only (HH-OO) are intended to protect human health when aquatic organisms are consumed from waters containing pollutants. These criteria do not protect the aquatic life itself; rather, they protect the health of humans who ingest fish or other aquatic organisms.

(g) The dioxin criteria apply to the sum of the dioxin toxicity equivalents expressed as 2,3,7,8-TCDD dioxin.

(h) The criteria for polychlorinated biphenyls (PCBs) applies to the sum of all congeners, to the sum of all homologs or to the sum of all aroclors.

BASIS FOR CHANGE: The order of Subsection J, subparagraphs J(1) and J(2) are transposed so the explanatory notes in new Subsection J, Subparagraph (2) of 20.6.4.900 (above) follow the table.

K. Acute aquatic life criteria for total ammonia are dependent on pH and the presence or absence of salmonids. The criteria in mg/L as N based on analysis of unfiltered samples are as follows:

pH	Where Salmonids Present	Where Salmonids Absent
6.5 and below	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0 and above	0.885	1.32

L. Chronic aquatic life criteria for total ammonia are dependent on pH, temperature and whether fish in early life stages are present or absent. The criteria are based on analysis of unfiltered samples and are calculated according to the equations in Paragraphs (1) and (2) of this subsection. For temperatures from below 0 to 14°C, the criteria for ~~0~~14°C apply; for temperatures above 30°C, the criteria for 30°C apply. For pH values below 6.5, the criteria for 6.5 apply; for pH values above 9.0, the criteria for 9.0 apply.

BASIS FOR CHANGE: The first column in the table below in Subsection L, Subparagraph L (1) (b) NMAC is redundant and proposed to be deleted; therefore, underlined additions in the text above are proposed to correspond to these changes.

(1) Chronic aquatic life criteria for total ammonia when fish early life stages are present.

(a) The equation to calculate chronic criteria in mg/L as N is:

$$((0.0577/(1 + 10^{7.688-pH})) + (2.487/(1 + 10^{pH-7.688}))) \times MIN\ (2.85, 1.45 \times 10^{0.028 \times (25-T)})$$

(b) Selected values of calculated chronic criteria in mg/L as N:

pH	Temperature (°C)										
	~~0 and below~~	14 and below	15	16	18	20	22	24	26	28	30 and above
6.5 and below	~~6.67~~	6.67	6.46	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	~~6.57~~	6.57	6.36	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	~~6.44~~	6.44	6.25	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	~~6.29~~	6.29	6.10	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	~~6.12~~	6.12	5.93	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	~~5.91~~	5.91	5.73	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	~~5.67~~	5.67	5.49	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	~~5.39~~	5.39	5.22	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	~~5.08~~	5.08	4.92	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	~~4.73~~	4.73	4.59	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	~~4.36~~	4.36	4.23	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	~~3.98~~	3.98	3.85	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	~~3.58~~	3.58	3.47	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	~~3.18~~	3.18	3.09	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	~~2.80~~	2.80	2.71	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	~~2.43~~	2.43	2.36	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	~~2.10~~	2.10	2.03	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	~~1.79~~	1.79	1.74	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	~~1.52~~	1.52	1.48	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	~~1.29~~	1.29	1.25	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	~~1.09~~	1.09	1.06	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	~~0.920~~	0.920	0.892	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	~~0.778~~	0.778	0.754	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	~~0.661~~	0.661	0.641	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	~~0.565~~	0.565	0.548	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0 and above	~~0.486~~	0.486	0.471	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

BASIS FOR CHANGE: The first column in the table above in Subsection L, Subparagraph L (1) (b) NMAC is redundant and proposed to be deleted; therefore, underlined additions in the table above are proposed to correspond to these changes.

(2) Chronic aquatic life criteria for total ammonia when fish early life stages are absent.

(a) The equation to calculate chronic criteria in mg/L as N is:

$$((0.0577/(1 + 10^{7.688-pH})) + (2.487/(1 + 10^{pH-7.688}))) \times 1.45 \times 10^{0.028 \times (25-MAX(T,7))}$$

(b) Selected values of calculated chronic criteria in mg/L as N:

pH	Temperature (°C)									
	~~7 and below~~	7 and below	8	9	10	11	12	13	14	15 and above
6.5 and below	~~10.8~~	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46
6.6	~~10.7~~	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36
6.7	~~10.5~~	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25
6.8	~~10.2~~	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10
6.9	~~9.93~~	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93
7.0	~~9.60~~	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73
7.1	~~9.20~~	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49
7.2	~~8.75~~	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22
7.3	~~8.24~~	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92
7.4	~~7.69~~	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59
7.5	~~7.09~~	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23
7.6	~~6.46~~	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85
7.7	~~5.81~~	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47
7.8	~~5.17~~	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09
7.9	~~4.54~~	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71
8.0	~~3.95~~	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36
8.1	~~3.41~~	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03
8.2	~~2.91~~	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74
8.3	~~2.47~~	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48
8.4	~~2.09~~	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25
8.5	~~1.77~~	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06
8.6	~~1.49~~	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892
8.7	~~1.26~~	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754
8.8	~~1.07~~	1.07	1.01	0.944	0.855	0.829	0.778	0.729	0.684	0.641
8.9	~~0.917~~	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548
9.0 and above	~~0.790~~	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471
At 15° C and above, the criterion for fish early life stages absent is the same as the criterion for fish early life stages present (refer to table in Paragraph (1) of this subsection).										

[20.6.4.900 NMAC - Rp 20 NMAC 6.1.3100, 10-12-00; A, 10-11-02; A, 05-23-05; A, 07-17-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The first column in the table above in Subsection L, Subparagraph L (2) (b) NMAC is redundant and proposed to be deleted; therefore, underlined additions in the table above are proposed to correspond to these changes.

20.6.4.901 PUBLICATION REFERENCES: These documents are intended as guidance and are available for public review during regular business hours at the offices of the surface water quality bureau. Copies of these documents have also been filed with the New Mexico state records center in order to provide greater access to this information.

A. American public health association. 1992. *Standard methods for the examination of water and wastewater, 18th Edition.* Washington, D.C. 1048 p.

B. American public health association. 1995. *Standard methods for the examination of water and wastewater, 19th Edition.* Washington, D.C. 1090 p.

C. American public health association. 1998. *Standard methods for the examination of water and wastewater, 20th Edition.* Washington, D.C. 1112 p.

D. United States geological survey. 1987. *Methods for determination of inorganic substances in water and fluvial sediments, techniques of water-resource investigations of the United States geological survey.* Washington, D.C. 80 p.

E. United States geological survey. 1987. *Methods for the determination of organic substances in water and fluvial sediments, techniques of water-resource investigations of the U.S. geological survey.* Washington, D.C. 80 p.

F. United States environmental protection agency. 1974. *Methods for chemical analysis of water and wastes.* National environmental research center, Cincinnati, Ohio. (EPA-625-/6-74-003). 298 p.

G. New Mexico water quality control commission. 2003. *(208) state of New Mexico water quality management plan*. Santa Fe, New Mexico. 85 p.

H. Colorado river basin salinity control forum. 20~~02~~11. *20~~02~~*11 *Review, water quality standards for salinity, Colorado river system.* Phoenix, Arizona. 99 p.

I. United States environmental protection agency. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms.* Office of research and development, Washington, D.C. (5th Ed., EPA 821-R-02-012). 293 p. http://www.epa.gov/ostWET/disk2/atx.pdf

J. United States environmental protection agency. 2002. *Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms.* Environmental monitoring systems laboratory, Cincinnati, Ohio. ([4th Ed., EPA 821-R-02-01). 335 p.

K. Ambient-induced mixing, in United States environmental protection agency. 1991. *Technical support document for water quality-based toxics control*. Office of water, Washington, D.C. (EPA/505/2-90-001). 2 p.

L. United States environmental protection agency. 1983. *Technical support manual: waterbody surveys and assessments for conducting use attainability analyses*. Office of water, regulations and standards, Washington, D.C. 251 p. http://www.epa.gov/OST/library/wqstandards/uaavol123.pdf

M. United States environmental protection agency. 1984. *Technical support manual: waterbody surveys and assessments for conducting use attainability analyses, volume III: lake systems*. Office of water, regulations and standards, Washington, D.C. 208 p. http://www.epa.gov/OST/library/wqstandards/uaavol123.pdf
[20.6.4.901 NMAC - Rp 20 NMAC 6.1.4000, 10-12-00; A, 05-23-05; A, 12-01-10; A, XX-XX-XX]

BASIS FOR CHANGE: The reference in Subsection H of 20.6.4.901 is updated to the most recent version (the basin report is updated on a triennial basis).

HISTORY of 20.6.4 NMAC:
Pre-NMAC History:
Material in the part was derived from that previously filed with the commission of public records - state records center and archives:
WQC 67-1, Water Quality Standards, filed 7-17-67, effective 8-18-67
WQC 67-1, Amendment Nos. 1-6, filed 3-21-68, effective 4-22-68
WQC 67-1, Amendment No. 7, filed 2-27-69, effective 3-30-69
WQC 67-1, Amendment No. 8, filed 7-14-69, effective 8-15-69
WQC 70-1, Water Quality Standards for Intrastate Waters and Tributaries to Interstate Streams, filed July 17, 1970;
WQC 67-1, Amendment Nos. 9 and 10, filed 2-12-71, effective 3-15-71
WQC 67-1, Amendment No. 11, filed 3-4-71, effective 4-5-71
WQC 73-1, New Mexico Water Quality Standards, filed 9-17-73, effective 10-23-73
WQC 73-1, Amendment Nos. 1 and 2, filed 10-3-75, effective 11-4-75
WQC 73-1, Amendment No. 3, filed 1-19-76, effective 2-14-76
WQC 77-2, Amended Water Quality Standards for Interstate and Intrastate Streams in New Mexico, filed 2-24-77, effective 3-11-77
WQC 77-2, Amendment No. 1, filed 3-23-78, effective 4-24-78
WQC 77-2, Amendment No. 2, filed 6-12-79, effective 7-13-79
WQCC 80-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, filed 8-28-80, effective 9-28-80
WQCC 81-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, filed 5-5-81, effective 6-4-81
WQCC 81-1, Amendment No. 1, filed 5-19-82, effective 6-18-82
WQCC 81-1, Amendment No. 2, filed 6-24-82, effective 7-26-82
WQCC 85-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, filed 1-16-85, effective 2-15-85
WQCC 85-1, Amendment No. 1, filed 8-28-87, effective 9-28-87
WQCC 88-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, filed 3-24-88, effective 4-25-88
WQCC 91-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, filed 5-29-91, effective 6-29-91
WQCC 91-1, Amendment No. 1, filed 10-11-91, effective 11-12-91

History of the Repealed Material:
WQC 67-1, Water Quality Standards, - Superseded, 10-23-73
WQC 73-1, New Mexico Water Quality Standards, - Superseded, 3-11-77
WQC 77-2, Amended Water Quality Standards for Interstate and Intrastate Streams in New Mexico, - Superseded, 9-28-80
WQCC 80-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, - Superseded, 6-4-81
WQCC 81-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, - Superseded, 2-15-85
WQCC 85-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, - Superseded, 4-25-88
WQCC 88-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, - Superseded, 6-29-91
WQCC 91-1, Water Quality Standards for Interstate and Intrastate Streams in New Mexico, - Superseded, 1-23-95
20 NMAC 6.1, Standards for Interstate and Intrastate Streams, - Repealed, 2-23-00
20 NMAC 6.1, Standards for Interstate and Intrastate Surface Waters, - Repealed, 10-12-00

Attachments

NEW MEXICO
ENVIRONMENT DEPARTMENT

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Governor

JOHN A. SANCHEZ
Lieutenant Governor

RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

ERIKA SCHWENDER
Director
Resource Protection Division

MEMORANDUM

TO: Kris Pintado, Standards, Planning and Reporting Team Leader

FROM: Jodey Kougioulis, Quality Assurance Officer

DATE: February 26, 2014

SUBJECT: Triennial Review – Most probable number (MPN) and colony forming units (cfu) enumeration methods and proposed standards reporting revision

Introduction and Purpose

The purpose of this memo is to address EPA's and SWQB staff comments and suggestions regarding the reporting of bacterial concentrations as MPN and to propose suggested revisions to the state's current reporting language for bacteria criteria which are expressed as colony forming units (cfu) per 100 ml. Currently, the SWQB reports bacteria data as most probable number (MPN) per 100 ml based on the use of IDEXX *Quanti-Tray* (QT) method which is an extended version of the IDEXX Colilert test. MPN and cfu represent different enumeration methods and result in different method specific units, but for purposes of reporting, EPA has used these terms interchangeably. EPA has approved methods for enumeration and allows reporting in either cfu or MPN per 100/ml in federal rule for ambient water (40 CFR, 2003) and for wastewater and sludge (40 CFR, 2007).

Background and General Description of MPN and cfu.

The MPN is a statistical estimate of the number of bacteria that, more probable than any other number, would give the observed result; it is not an actual count of the bacteria present. Membrane filtration (MF) methods which produce results expressed as cfu are culture-based and results are quantified by counting the number of colonies that arise from bacteria captured on the membrane filter per volume of water filtered. Although expressed as an actual count of the bacterial colony forming units, the number is still considered an estimate because colonies can be produced by one or several cells that can clump together in the sample. MPN methods are also culture-based with a defined substrate which produces an estimate number (density) of organisms based on the combination of positive and negative test tube results that can be read from a statistical probability MPN table.

Proposal

The SWQB currently uses an approved EPA method for sampling and analyzing bacteria levels in its ambient water quality monitoring program and reports these results in MPN. The water quality standards for bacteria criteria are proposed to be revised to reflect SWQB's current reporting practices and EPA's approved use of either membrane filtration methods, reported as cfu, or MPN methods, reported as MPN for enumeration of bacteria in ambient water and effluent. This change, if adopted, would allow results to be reported in either cfu or MPN, depending on the analytical method. The most appropriate place to do this may be in 20.6.4.900.D and E of NMAC by adding language similar to the following: "Water quality standards for E. coli are expressed in colony forming units per 100 milliliters of water (cfu/100 ml) or as a Most Probable Number (MPN)/100 ml."

Related Research

There have been numerous published papers that address the similarities or differences between enumeration results obtained by cfu methods and those obtained by MPN methods. Much of the earlier research concluded that *"there was no significant difference for the enumeration of E. coli between the QT and MF methods" (Rompré et al., 2002).*

More recently published research by Wohlsen et al. (2006) does show a significant difference between the two enumeration methods when using a standard reference inoculum. The use and calibration of a standard reference inoculum of only viable cells still needs to be related to original criteria development which was based on a combination of frequency, magnitude, and duration of exposure to ambient recreational waters, bacterial densities as enumerated by MF, and selected illness rates in response. As stated earlier, this is primarily a reporting revision to acknowledge the programmatic reality that both MPN and cfu can be reported and used to assess against the water quality standard.

Staff and EPA Comments, Suggestions, and Initial Review of Bacteria Criteria Reporting

Responses to both the EPA, SWQB staff, and the proposal justification will need to be clearly communicated in a consistent and coordinated fashion. The need to remain consistent with existing water quality standard language, definitions, and format may limit the expanse of revised language but ultimately the simple proposed revision will communicate the available reporting options for bacteria criteria. Comments from SWQB staff largely focused on the fact that MPN and cfu are enumerated and expressed differently with method specific units and that clear definitions are needed to describe this difference. EPA's comments and suggestion are largely in concert with the proposed revision and the suggested language will provide the clarity needed for criteria interpretation.

SWQB Staff Questions and Responses

Question 1): I have come across several scholarly articles that attempt to correlate MPN to cfu. They are not the same; cfu represents an absolute number of units, whereas MPN represents a theoretical value (often considered the maximum value).

Response: *EPA permits staff and SWQB staff raised issues about the enumeration of bacteria - most probable number (MPN) and colony forming units (*cfu*) - relative to implementation and assessment of the WQS. The traditional plate tests, including membrane filtration, estimate or count 'colonies' of bacteria reported as* cfu*. These provide a direct count of an indicator organism (E. coli) in ambient water or wastewater based on the development of colonies in/on media and a calculation is still performed. While microscopic counts may be more accurate, it's costly and time consuming, and there's still the problem of what's viable or not. Very few tests are conducted to determine live and dead colonies; in summary exact counts are generally not feasible to obtain. Newer tests such as Colilert (which is used by SWQWB for assessment and monitoring) report data as MPN which is a statistical representation of what level of E. coli is <u>likely</u> present in a sample. While MPN and* cfu *may not be entirely equivalent, for the purposes of reporting, these terms are currently used interchangeably by the EPA. EPA has approved these methods for enumeration in federal rule for ambient water (40 CFR, 2003) and for wastewater and sludge (40 CFR, 2007). The currently recommended EPA recreational or bacteria criteria for E. coli are expressed as cfu/100 ml measured using EPA Method 1603 or any other equivalent method that measures culturable E. coli. Therefore, the water quality standards are under deliberation to be revised to reflect the use of updated methods for monitoring, assessment and reporting. After much consideration, the most appropriate place to do this may be in 20.6.4.900.D and E of NMAC by adding language similar to the following:*

> *"Water quality standards for E. coli are expressed in colony forming units per 100 milliliters of water (cfu / 100 ml) or as a Most Probable Number (MPN)/100 ml"*

References for EPA Method 1603 and EPA's final rules establishing alternate test procedures could also be included in 20.6.4.901 NMAC as references.

Abbreviations for both cfu *and MPN are suggested to be included in the WQS definitions.*

Question 2) Similar to the cfu/100mL definition, do we need to make reference to cfu/100mL in the MPN definition?
Add the term "most probable number" (under terms beginning with the letter 'M').

Response: *Generally, the definitions seem to stand on their own, e.g., there doesn't seem to be any 'cross referencing' in these definitions. Instead of adding a definition for MPN, the abbreviation for MPN is retained in this section. Please also see the previous discussion in response to bacteria enumeration (under 20.6.4.7.A (3)(a) NMAC), and response below.*

"MPN" will be listed under the abbreviations section of the definitions, so it'll be 'defined' in that way. It's also appropriate to add 'MPN' (as an alternate enumeration to cfu) under the criteria section in 20.6.4.900.D and E NMAC (see the new language in that section). As there's not a "full" definition for cfu in the WQS, to be consistent with the rule format, a "full" definition for MPN won't be added. Also, there's really not a concise, easily understood definition for cfu to put into the standards. Both enumeration methods are also fully described in the EPA criteria recommendations and supporting documents, in the methods, and in the scientific literature.

EPA Comment and SWQB Response

The Region's concern with the state's current bacteria criteria are related to how the provision reads and its interpretation. The *E. coli* standard that the state uses is expressed as colony forming units (cfu) per 100 ml. In a plain reading, this provision requires a specific test method but does not allow an alternative test. Generally the Region recommends avoiding this type of approach to test methods.

When bacterial Total Maximum Daily Loads (TMDL) are issued, they may specify extremely large numbers of cfu/100 ml as a loading limit. This requires building an equation for calculating the loading limit as expressed in the TMDL into a footnote into NPDES permits. To simplify the process, the Region has consulted with waste water treatment plant operators to determine if the most probable number (MPN) can be used as an equivalent to cfu/100 ml. The general answer is yes, and the Region has been using this approach. NMED inspectors seem to agree with this approach, since they also see the problem in the field. The problem here is that this approach requires the use of a different test method. What the Region suggests is that both the standards and TMDL guidance documents refer to both cfu/100 ml *and* MPN as equivalent, allowing either generally approved test method to be used to account the level of indicator bacteria in permits.

Response: *EPA Region 6 has suggested that the water quality standards and the state's TMDL guidance refer to both colony forming units (*cfu*) and most probable number (MPN), as EPA has approved the use of test methods with results that are expressed in either cfu or MPN. The use of more cost-effective and time efficient methods in which counts are expressed as MPN was approved by EPA as equivalent for testing ambient waters in 2003*[1] *, and for wastewater and sewage sludge in 2007*[2]*. The SWQB is currently using an approved EPA method for sampling and analyzing bacteria levels in ambient water and reporting results in MPN. The currently recommended EPA recreational or bacteria criteria for E. coli are expressed as* cfu*/100 ml measured using EPA Method 1603 or any other equivalent method that measures culturable E. coli* [3],[4]*. Therefore, the water quality standards are proposed to be revised to reflect the use of updated methods for monitoring, assessment and reporting. References for EPA Method 1603 and EPA's final rules establishing alternate test procedures may be considered for inclusion under 220.6.4.901 NMAC.*

Footnotes

1. *U.S. Federal Register* - 40 CFR Part 136 Vol. 68, No. 139; July 21, 2003.
2. *U.S. Federal Register* - 40 CFR Parts 136 and 503, Vol. 72, No. 157; March 26, 2007.
3. EPA, 2012: http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/upload/factsheet2012.pdf
4. USEPA. 2002. Method 1603: *Escherichia coli* (*E. coli*) In Water By Membrane Filtration Using Modified membrane-Thermotolerant *Escherichia coli* Agar (modified mTEC). U.S. Environmental Protection Agency, Office of Water, Washington D.C. EPA–821–R–02–023

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Annie Rompre´, Pierre Servais, Julia Baudart, Marie-Rene´e de-Roubin, Patrick Laurent (2002). *Detection and enumeration of coliforms in drinking water: current methods and emerging approaches.* Journal of Microbiological Methods 49 (2002) 31–54

U.S. Federal Register - 40 CFR Part 136 Vol. 68, No. 139; July 21, 2003.

U.S. Federal Register - 40 CFR Parts 136 and 503, Vol. 72, No. 157; March 26, 2007.

USEPA, 2012:
http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/upload/factsheet2012.pdf

USEPA. 2002. Method 1603: *Escherichia coli* (*E. coli*) In Water By Membrane Filtration Using Modified membrane-Thermotolerant *Escherichia coli* Agar (modified mTEC). U.S. Environmental Protection Agency, Office of Water, Washington D.C. EPA–821–R–02–023

Wohlsen, T., Bates, J., Vesey, G., Robinson, W.A. and M. Katouli (2006) Evaluation of the methods for enumerating coliform bacteria from water samples using precise reference standards. *Letters in Applied Microbiology* **42**, 350-356.

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To: Kristine Pintado, Water Quality Standards Team Leader
NMED, Surface Water Quality Bureau

From: Michael B. Sloane, Chief, Fisheries Management Division, New Mexico Department of Game and Fish

Subject: Piscicide Provision in 20.6.4.10 NMAC

Date: March 22, 2014

Cc:

Justification for Amending 20.6.4.16 NMAC.

The New Mexico Department of Game and Fish (NMDGF) frequently uses piscicides (fish toxicants) to remove unwanted species from various waters within the State of New Mexico. Various formulations of rotenone are currently registered by the U.S. Environmental protection agency. Historic rotenone use focused on enhancement of sport fisheries primarily in reservoirs with contemporary use limited to native fish restoration efforts. Prior to the late 1990s, the use of a piscicide in waters of New Mexico was unregulated though concerns existed regarding violations of 20.6.4.13 NMAC. The U.S. Environmental Protection Agency consistently held the position that application of a pesticide in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act, including piscicides, was not a point source pollutant (71 Fed. Reg. 68,483) and thus did not require a National Pollutant Discharge Elimination System (NPDES) permit. As a result, 20.6.4.16 NMAC was adopted to provide a process for a piscicide use proponent to obtain approval from the NM Water Quality Control Commission (WQCC) with a mandatory hearing by the WQCC for all planned uses. The WQCC has held approximately seven hearings and repeatedly hears the same testimony with little new information regarding human or environmental health concerns. Consistent expert testimony indicates the products and their use are safe and effective for achieving fishery management and conservation goals in New Mexico.

Planned use of a piscicide in New Mexico requires compliance with a variety of Federal and State laws including the National Environmental Policy Act of 1969 (NEPA), Endangered Species Act of 1974 (ESA), and 20.6.4.16 NMAC Planned Use of a Piscicide. All known piscicide applications to waters of New Mexico have been conducted by either federal and/or state natural resource agencies (e.g. U.S. Forest Service, U.S. Fish and Wildlife Service, or

NMDGF). The NMDGF relies upon federal Sportfish Restoration Act funds to support agency operations. Many waters are located within U.S. Forest Service boundaries or involve threatened or endangered species. As a result, a federal nexus is created which triggers review under NEPA and ESA. Reviews conducted under ESA focus on the effects of the proposed action on threatened and endangered species with review limited to the agency proponent and the U.S. Fish and Wildlife Service. Review under NEPA, however, includes public comment periods, public review of environmental documents, and public involvement in the decision making process. The public involvement process required by NEPA consistently ensures public awareness and participation in project development and implementation similar to the procedures set out in 20.6.4.16 NMAC. In fact, the two are repetitive processes.

The requirement to obtain NPDES permits for point source discharges from pesticide applications to waters of the United States stems from a 2009 decision by the Sixth Circuit Court of Appeals. In its ruling on *National Cotton Council, et al. v. EPA*, the Court vacated the EPA's 2006 rule which said NPDES permits were not required for discharges of pesticides to waters of the United States for applications of pesticides to, or over, including near such waters when in compliance with the existing label (per the Federal Insecticide, Fungicide, and Rodenticide Act, or "FIFRA"). In its ruling, the Sixth Circuit determined that (1) biological pesticides and (2) chemical pesticides that leave a residue are pollutants as defined under the CWA and as such are subject to regulations applicable to pollutants. Courts have previously determined that applications of pesticides, such as from nozzles of planes and trucks, irrigation equipment, etc. are point sources. As a result of the Sixth Circuit's decision, point source discharges to waters of the United States from the application of pesticides require NPDES permits as of October 31, 2011. http://cfpub.epa.gov/npdes/faqs.cfm?program_id=410#476. The U.S. Environmental Protection Agency issued a nationwide Pesticide General Permit to cover pesticide applications in states, including those without NPDES permit programs, which includes activities by NMDGF. Since 2012, NMDGF has obtained coverage under the nationwide general permit and obtained approval from the WQCC to conduct piscicide applications in the Rio Costilla basin. The new NPDES permit process creates a new redundancy by requiring a federal review of piscicide use in addition to the requirements of 20.6.4.16 NMAC.

Considering federal law already requires public disclosure under NEPA, review of effects on threatened and endangered species under ESA, and regulation of piscicides under the Clean Water Act and the Federal Insecticide, Fungicide, and Rodenticide Act, NMDGF proposes to amend 20.6.4.16 NMAC to streamline the piscicide use process for more efficient use of government resources and enhance fishery management and conservation activities in New Mexico. If the planned use of a piscicide is covered under a NPDES permit, the proposed piscicide use would require no additional WQCC review but will require post-treatment assessment monitoring and additional public notice to local entities. If a NPDES permit is not available (e.g., Congress acts on proposed legislation to remove the NPDES requirement for pesticides), then the WQCC would still have the opportunity to review the project in the absence of other federal review. Whether a hearing is held to review the project would be discretionary, however, rather than a mandate.

20.6.4.16 PLANNED USE OF A PISCICIDE: The use of a piscicide registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. Section 136 *et seq*., and under the New Mexico Pesticide Control Act (NMPCA), Section 76-4-1 *et seq*. NMSA 1978 (1973) in a surface water of the state, shall not be a violation of Subsection F of 20.6.4.13 NMAC when such use is covered by a National Pollutant Discharge Elimination System (NPDES) permit or has been approved by the commission under procedures provided in this section. The use of a piscicide which is covered by a NPDES permit shall require no further review by the commission and the person whose application is covered by the NPDES permit shall meet the additional notification and monitoring requirements outlined in Subsection F of 20.6.4.16 NMAC. The commission may approve the reasonable use of a piscicide under this section if the proposed use is not covered by a NPDES permit to further a Clean Water Act objective to restore and maintain the physical or biological integrity of surface waters of the state, including restoration of native species.

A. Any person seeking commission approval of the use of a piscicide not covered by an NPDES permit shall file a written petition concurrently with the commission and the surface water bureau of the department. The petition shall contain, at a minimum, the following information:

(1) petitioner's name and address;

(2) identity of the piscicide and the period of time (not to exceed five years) or number of applications for which approval is requested;

(3) documentation of registration under FIFRA and NMPCA and certification that the petitioner intends to use the piscicide according to the label directions, for its intended function;

(4) target and potential non-target species in the treated waters and adjacent riparian area, including threatened or endangered species;

(5) potential environmental consequences to the treated waters and the adjacent riparian area, and protocols for limiting such impacts;

(6) surface water of the state proposed for treatment;

(7) results of pre-treatment survey;

(8) evaluation of available alternatives and justification for selecting piscicide use;

(9) post-treatment assessment monitoring protocol; and

(10) any other information required by the commission.

B. Within thirty days of receipt of the petition, the department shall review the petition and file a recommendation with the commission to grant, grant with conditions or deny the petition. The recommendation shall include reasons, and a copy shall be sent to the petitioner by certified mail.

C. The commission shall review the petition and the department's recommendation and ~~shall~~ within 90 days of receipt of the department's recommendation may hold a public hearing in the locality affected by the proposed use in accordance with Adjudicatory Procedures, 20.1.3 NMAC. In addition to the public notice requirements in Adjudicatory Procedures, 20.1.3 NMAC, the petitioner shall provide written notice to:

(1) local political subdivisions;

(2) local water planning entities;

(3) local conservancy and irrigation districts; and

(4) local media outlets, except that the petitioner shall only be required to publish notice in a newspaper of circulation in the locality affected by the proposed use.

D. In a hearing provided for in this Section or, if no hearing is held, in a commission meeting, the registration of a piscicide under FIFRA and NMPCA shall provide a rebuttable presumption that the determinations of the EPA Administrator in registering the piscicide, as outlined in 7 U.S.C. Section 136a(c)(5), are valid. For purposes of this Section the rebuttable presumptions regarding the piscicide include:

(1) Its composition is such as to warrant the proposed claims for it;

(2) Its labeling and other material submitted for registration comply with the requirements of FIFRA and NMPCA;

(3) It will perform its intended function without unreasonable adverse effects on the environment; and

(4) When used in accordance with all FIFRA label requirements it will not generally cause unreasonable adverse effects on the environment.

(5) "Unreasonable adverse effects on the environment" has the meaning provided in FIFRA, 7 U.S.C. Section 136(bb): "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide."

E. After a public hearing or commission meeting, if no hearing is held, the commission may grant the petition in whole or in part, may grant the petition subject to conditions, or may deny the petition. In granting any petition in whole or part or subject to conditions, the commission shall require the petitioner to implement post-treatment assessment monitoring and provide notice to the public in the immediate and near downstream vicinity of the application prior to and during the application.

F. Any person whose application is covered by a NPDES permit shall provide written notice to local entities as described in 20.6.4.16 subsection C (1) to (4) and subsection (E) and implement post-treatment assessment monitoring within the application area.

[20.6.4.16 NMAC - Rn, Paragraph (6) of Subsection F of 20.6.4.12 NMAC, 05-23-05; A, 05-23-05; A, XX-XX-XX]

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MEMORANDUM

TO: **Kris Pintado, Standards, Planning, and Reporting Team Leader**

FROM: **Bryan Dail and Gary Schiffmiller, Environmental Scientists**

DATE: **March 6, 2014**

SUBJECT: **Triennial Review – Gila River segment description and associated Specific Conductivity criteria**

Introduction and Purpose

The purpose of this memo is to address a geographic error in the New Mexico Administrative Code identifying segment-specific criteria for specific conductivity in tributaries of the Gila River.

Background and Problem Description

The segment description in New Mexico's Water Quality Standards, 20.6.4.503 NMAC, misidentifies a perennial reach of the West Fork Gila River. Correcting the description requires the associated specific conductivity criterion also be evaluated. The 20.6.4.503 NMAC currently states:

20.6.4.503 GILA RIVER BASIN - All perennial tributaries to the Gila river above and including Mogollon creek.

A. Designated Uses: domestic water supply, high quality coldwater aquatic life, irrigation, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: specific conductance 300 µS/cm or less for the **main stem of the Gila river above Gila hot springs** and 400 µS/cm or less for other reaches; 32.2°C (90°F) or less in the east fork of the Gila river and Sapillo creek below Lake Roberts; the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

[20.6.4.503 NMAC - Rp 20 NMAC 6.1.2503, 10-12-00; A, 05-23-05; A, 12-01-10]

Segment Description: The current language indicates a segment-specific criterion (for specific conductivity) on the **main stem Gila River above Gila hot springs**. However, this portion of the segment (i.e., above and below the Gila Hot Springs to the confluence with the East Fork Gila River) is identified on USGS maps as the West Fork of the Gila River (see Figure 1 below). The segment description should be corrected to be consistent with USGS maps of the Gila River system.

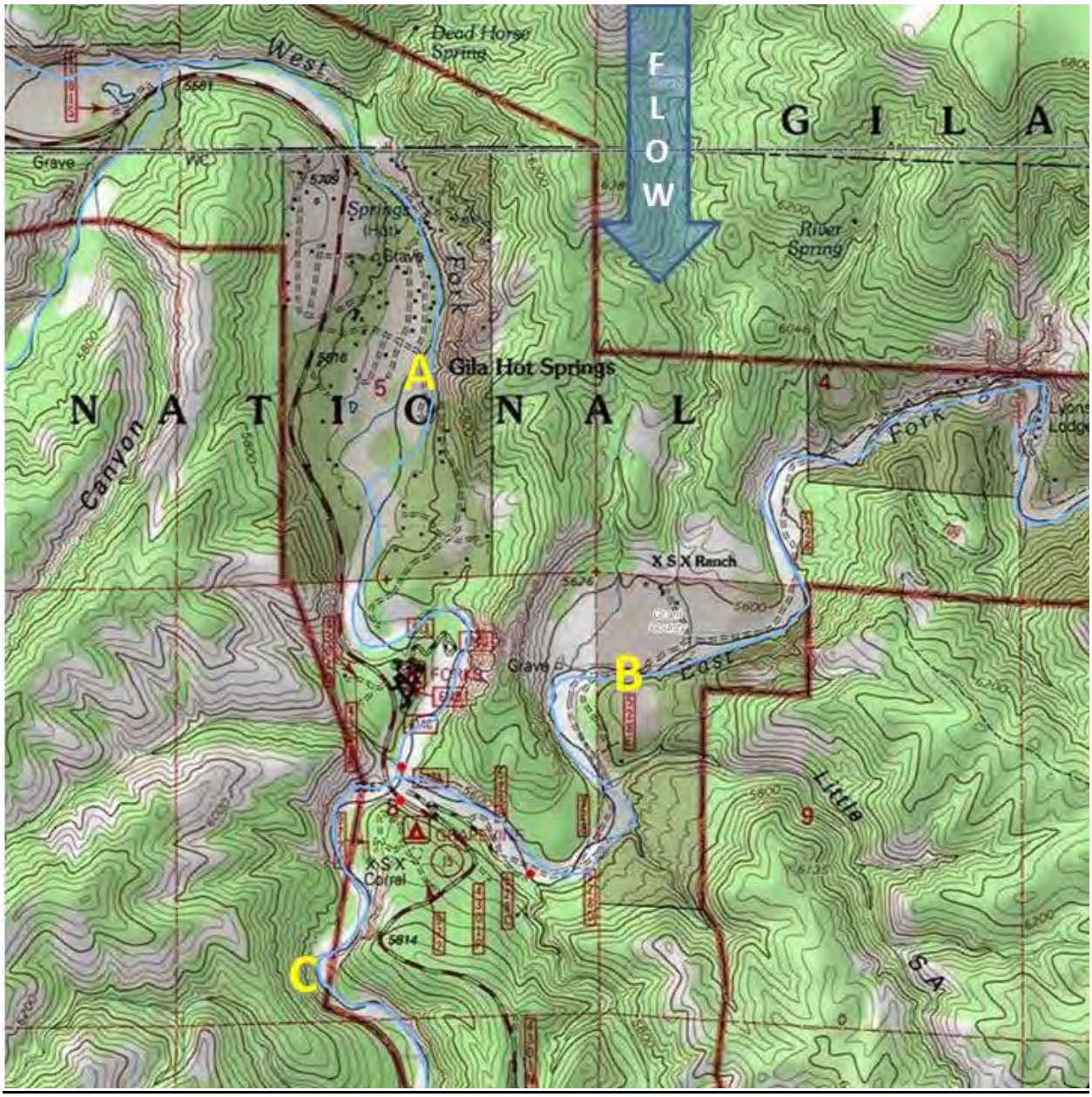

Figure 1. USGS topographic map quadrangle o33208b2, Gila Hot Springs, NM (scale: 1:24,000) showing the West Fork Gila River at Gila Hot Springs (A) the East Fork Gila River (B) and below the confluence of the W. Fork and E. Fork forming the Gila River (C). Red dots (●) indicate SWQB Water Quality sampling sites.

The roadway paralleling this segment of the West Fork Gila River is also identified on maps as “W Fork Road” (see Figure 2 below).

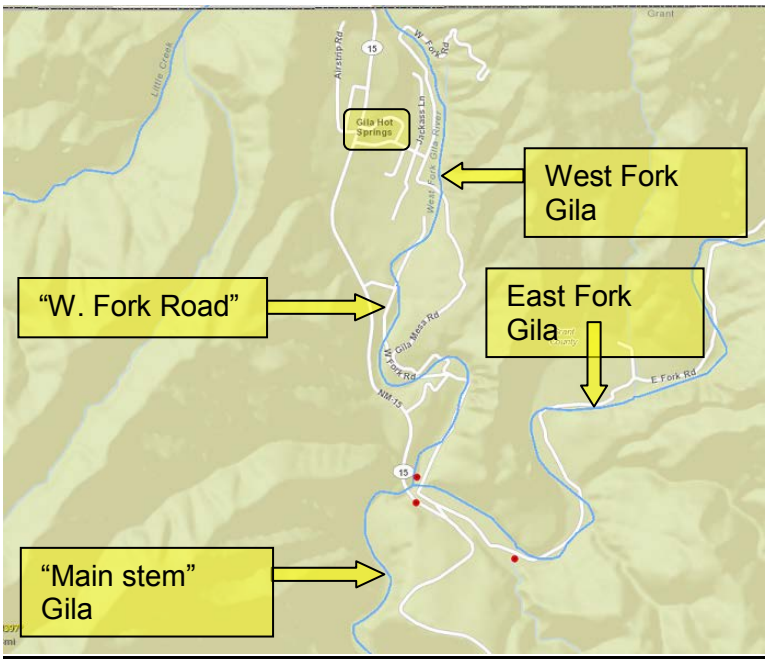

Figure 2. Road map with labels showing W Fork Gila River, W. Fork Rd, East Fork Gila River, E. Fork Rd. and main stem Gila River. Red dots (●) indicate SWQB Water Quality sampling sites.

Specific Conductivity Revision

The language misidentifying a segment of the West Fork Gila River as “main stem” has been present since the New Mexico Water Quality Standards were first adopted and criteria for specific conductivity (SC) have been part of this segment since 1976. As a statement of basis was not available, the presumption is that the influence of Gila Hot Springs Complex (GHSC; a series of geothermal springs near the town of Gila Hot Springs) was considered to be a possible contributor to high specific conductivity downstream of its confluence with the West Fork Gila River. Specific conductivity of thermal waters is often many times that of cold spring-fed, snow melt and rain-fed waters, and data exist for several hot springs in the Gila area. To evaluate the assignment of SC criteria to the West Fork Gila River segment, previously misidentified as the main stem Gila River, SWQB investigated the water quality data for hot springs in the area (Table 1a) and the West Fork Gila River below the GHSC and summarized the available data (Table 1b).

Data indicate that the relatively small volume of GHSC water entering the West Fork Gila River does not increase SC in the West Fork Gila River appreciably. West Fork Gila River below the GHSC maintains a SC well below 300 µS/cm (Table 1b). The average SC is 214 µS/cm and the maximum is 259 µS/cm. The total flow of GHSC waters to the West Fork Gila River has been documented as an average of 0.44 cfs; the GHSC main source has a rate of 0.17 cfs at peak flow (Schwab et al., 1982; Lund et al., 1991; Witcher 2002;). Average annual flow at the most upstream available gage in the Gila watershed, Gila River near Gila, NM (090430500), was 156 cfs (1929-2012). Thus, even at the lowest recorded flows, the addition of higher specific conductivity water from GHSC is minimal, and the existing segment-specific SC criterion (400 µS/cm) below this source does not reflect actual conditions. While the average SC measured below GHSC (214±27 µS/cm) is different from the average SC measured above the

confluence (165±22 µS/cm), both are consistently well below a 300 µS/cm criterion including standard deviation around the mean.

Table 1a. Specific conductivity (µS/cm) of grab samples at select hot springs in the Gila drainage (Summers, 1972)

Water body	Specific conductivity* 1	Specific conductivity 2	Specific conductivity 3	Specific conductivity 4
Hot Springs				
Gila Hot Springs (W. Fork Gila)	640	560	620	590
Hot Springs (E. Fork Gila)	560	560	581	574
Hot Springs (M. Fork Gila)	720	735	771	762

Table 1b. Specific conductivity (µS/cm) of grab samples at select water quality grab samples in Gila River tributaries performed by the Surface Water Quality Bureau

Water body	Specific conductivity* 1	Specific conductivity 2	Specific conductivity 3	Specific conductivity 4
Gila tributaries				
West Fk Gila River (bel GHSC)	**204**	**239**	**259**	**204**
Middle Fk Gila River (abv W. Fk Gila)	105	255	171	247
East Fk Gila River (abv Gila River)	213	221	319	313

*SC measurements are reported in µS/cm; river samples were conducted by SWQB and are from 4 grab sample taken between March and October of 2011; Hot Springs sampling was reported in W.K. Summers, 1972 as measured by several contract labs (1 through 4). Data in green highlight that the West Fork Gila River is consistently able to attain the "300 or below" SC criteria.

In addition, assessed perennial tributaries to the West Fork Gila (Middle Fork Gila) and tributaries thereto all consistently show SC below 300 µS/cm (Table 2).

Table 2. Specific conductivity (µS/cm) of tributaries of the West Fork Gila River (Middle Form Gila and tributaries thereto) performed by the Surface Water Quality Bureau

Water Body:	Middle Fork Gila	Iron Creek	Gilita Creek	Willow Creek
Specific Conductivity (µS/cm ±SD*)	215±21.1	99±5.0	95±0.9	78±0.8

*SD= Standard deviation of the mean

Additional tributaries to the West Fork Gila River, (White Creek, Turkey Feather Creek and Cub Creek) are not currently assessed, however their combined influence on the West Fork are such that West Fork Gila SC below these tributaries is well below the 300 µS/cm criteria (Table 1b).

The segment specific SC of 400 µS/cm for all <u>other</u> perennial tributaries (other than the West Fork Gila River and its tributaries) above and including Mogollon creek is appropriate given SWQB's most recent survey data for those tributaries (Table 3).

Table 3. Specific conductivity statistics for East Fork, Middle Fork and main stem Gila River and tributaries; SWQB data from 2005 and 2011 surveys.

Specific Conductivity (µS/cm)	E. Fork Gila River (abv Gila River)	Gila River (abv Turkey Creek.)	Sapillo Creek	Turkey Creek	Middle Fork Gila River (abv West Fork Gila River)	Beaver Creek
Average:	286	324	336	298	216	304
Max:	319	326	368	301	250	306

<u>Recommended Revisions</u>

To be consistent with USGS maps and local knowledge; the segment description should be revised as follows (strikeout indicates a change). According to analyses of SC and flow data, the West Fork Gila River and its tributaries currently maintain SC criteria of 300 µS/cm. The segment specific SC of 400 µS/cm for all <u>other</u> perennial tributaries (other than the West Fork Gila River and its tributaries) upstream of and including Mogollon Creek is appropriate.

20.6.4.503 GILA RIVER BASIN - All perennial tributaries to the Gila river ~~above~~ <u>upstream of</u> and including Mogollon creek.

A. Designated Uses: domestic water supply, high quality coldwater aquatic life, irrigation, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: <u>specific conductance of 400 µS/cm or less for all perennial tributaries except West Fork Gila and tributaries thereto, specific conductance of 300 µS/cm or less.</u> ~~main stem of the Gila river above Gila hot springs and 400 µS/cm or less for other reaches~~; 32.2°C (90°F) or less in the east fork of the Gila river and Sapillo creek ~~below~~ <u>downstream</u> of Lake Roberts; the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

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USE ATTAINABILITY ANALYSIS

AQUATIC LIFE USES FOR THE MIMBRES RIVER IN NEW MEXICO

NEW MEXICO ENVIRONMENT DEPARTMENT

SURFACE WATER QUALITY BUREAU

MARCH 2014

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SUMMARY

This Use Attainability Analysis (UAA) is conducted to determine factors affecting the attainment of aquatic life use (ALUs), to identify the most protective aquatic life use(s) for the Mimbres watershed, and to perform a data-driven evaluation of current or existing uses. From the analysis, the Surface Water Quality Bureau (SWQB) proposes to refine the currently designated uses within a weight of evidence approach. Reaches of the Mimbres River exceed criteria for its designated ALU as high quality coldwater and coldwater; surveys of the chemical, physical, and biotic indicators in the middle to lower Mimbres River watershed suggest natural temperatures of cold to cool, with warm water temperature transitions. It is recognized in the current water quality standards that in some instances, adopted numeric criteria for a body of water reflect current uses and not necessarily the existing or attainable conditions (Subsection B, 20.6.4.10 NMAC):

> **20.6.4.10 REVIEW OF STANDARDS; NEED FOR ADDITIONAL STUDIES:**
> **B.** It is recognized that, in some cases, numeric criteria have been adopted that reflect use designations rather than existing conditions of surface waters of the state. Narrative criteria are required for many constituents because accurate data on background levels are lacking. More intensive water quality monitoring may identify surface waters of the state where existing quality is considerably better than the established criteria. When justified by sufficient data and information, the water quality criteria will be modified to protect the attainable uses.

This UAA follows the EPA Water Quality Standards Handbook (EPA 1994) and addresses the following questions:

(1) What are the current aquatic life uses for the Mimbres and its significant tributaries?

(2) What are the causes of any impairment of the aquatic life uses?

(3) What are the aquatic life uses that can be attained based on the physical, chemical, and biological characteristics of the water body?

Water Quality Survey data (NMED/SWQB 2011) show temperature criteria were exceeded in the lower Mimbres River (perennial reaches downstream of Willow Springs) and in the middle Mimbres (perennial reaches of Willow Springs Canyon to Cooney Canyon). Based on this UAA, it is recommended to:

(1) Retain the headwater segment, Cooney Canyon to headwaters of the Mimbres River, and East Fork Mimbres (McKnight canyon) from the fish barrier to the headwaters as a High Quality Coldwater (HQCW) Aquatic Life Use (ALU), including all perennial tributaries from New Mexico ecoregion 23d (Subalpine forests);

(2) Re-designate the perennial reaches of the middle Mimbres River as a Coldwater (CW) ALU, from below Cooney Canyon to just below the upper boundary of the Nature Conservancy property (Upper TNC), at a point where Allie Canyon joins the Mimbres River; and,

(3) Assign a Coolwater ALU to the perennial reaches of the main stem of the Mimbres River downstream of Allie Canyon.

A weight of evidence approach was used to determine the attainable ALU including recent thermograph (water temperature) data (2009, 2003), river physiognomy, fish communities, and New Mexico's Ecoregional setting (Omernik,1987). Each will be discussed in support of the UAA recommendations.

INTRODUCTION

Study Area

The Mimbres is listed as an endorheic "closed basin" watershed in southwestern New Mexico (USGS HUC 13030202). The watershed spans several ecological zones or "ecoregions" (Figure 1 and Table 1). As described in New Mexico's Standards for Interstate and Intrastate Surface Waters (NMAC 20.6.4, 2011), the Mimbres has designated uses of irrigation, domestic water supply, livestock watering, wildlife habitat, and primary contact. Aquatic life uses include high-quality cold water for the perennial reaches *upstream of the confluence with Willow Springs canyon and all perennial tributaries therein* and coldwater downstream of the confluence (20.6.4.803 and 20.6.4.804 NMAC).

The watershed drains an area of approximately 5,140 square miles (13,313 square km), and consists of approximately five perennial confluences or tributaries; the mainstem is approximately 91 miles in length (146 km). Snowmelt and rain-fed headwaters arise from the southwestern slopes of the Black Range (igneous mountain range running north-south in Sierra and Grant counties in west-central

Figure 1. Map of the Mimbres River, current segments, and its Ecoregional setting. (See Table 1 for alphanumeric Ecoregional code assignments).

New Mexico); the river continues through the Mimbres valley into the Chihuahuan Desert grasslands south of Silver City. The Mimbres headwaters are in U.S. Forest Service lands and the reach flowing through the Mimbres valley is mostly privately held, including five linear miles in conservation easement by The Nature Conservancy (TNC) organization for the protection of riparian zones as habitat for the Chiricahua leopard frog (*Lithobates chiricahuensis*), to restore natural flow regime, and promote recovery of aquatic habitat loss (TNC; accessed 01/2014).

Water use in the Mimbres basin includes both surface water diversions for agriculture and groundwater pumping for agriculture, mining, and municipal uses. Irrigation began in the Mimbres basin in the early 1900's, expanding significantly during the 1930's and peaking in the mid to late 1970's (White, 1934; Theis, 1939; Cuddy & Keyes., 2011). Consumption of groundwater for irrigation, for instance, peaked in 1979 at 72,725 Acre-Feet, whereas more recent data shows a continual decline in use, and less than half of the peak drawdown (28,170 Acre-Feet in 2005) (Cuddy *et al.*, 2011). Basinwide analysis, however, has shown significant drawdown as evidenced by an average of 0.3 ft well water level loss per year (Effati, 2014).

Mimbres River surface flow ceases north of Deming, NM, however the dry river bed periodically channels storm flow beyond the area where cessation of surface flow typically occurs. The Mimbres River system traverses four Level IV Ecoregions; the Arizona/New Mexico Subalpine Forests (23d), the Montane Conifer Forests (23c), the Madrean Lower Montane Woodlands (23b), and the Chihuahuan Desert Grasslands (24b) (Figure 1 and Table 1).

Table 1: Ecoregions of the Mimbres basin*

Ecoregion Code	Relevant Segment	Name	Elevation (ft)	Hydrology	Physiography
23		**Arizona/New Mexico Mountains**			
23b	20.6.4.804	Madrean Lower Montaine Woodlands	5,500-7,200	Moderate to high gradient streams	High hills, low mountains and some canyons
23c	20.6.4.804	Montane Conifer Forests	7,000-9,500	High to moderate gradient streams	Open low mountains, numerous canyons
23d	20.6.4.804	Arizona/New Mexico Subalpine Forests	9,500+	High gradient perennial streams	High mountains, steep slopes
24		**Chihuahuan Deserts**			
24a	20.6.4.803	Chihuahuah Basins and Playas	<4,500	Closed basin ephemeral streams	Rolling hill basins, sediment filled grabens
24b	20.6.4.803	Chihuahuan Desert Grasslands	<4,500	Perreneal, intermittant	Plateaus, intermountain basins, alluvial fans

*Griffiths et al., 2006

Attainability of Current Aquatic Uses and Temperature Criteria in the Mimbres River and its Tributaries

The New Mexico Water Quality Control Commission (NMWQCC) promulgates water quality standards for inter- and intrastate waters and has defined the Mimbres as a closed river basin within segments 20.6.4.803 and 20.6.4.804 NMAC of the water quality standards, including:

1) Mimbres River perennial reaches below the town of Mimbres, NM (Willow Springs Canyon; Latitude: 32.8561861 Longitude: -107.9797612).
2) Mimbres River perennial reaches above the town of Mimbres, NM (Willow Springs Canyon),
3) Mimbres River at Bear Canyon Reservoir (Latitude: 32.8828523 Longitude: -107.9922618), and
4) Ephemeral and Intermittent tributaries.

State Water Quality Standards (WQS) are codified in the New Mexico Administrative Code (NMAC) as *Standards for Interstate and Intrastate Surface Waters* (20.6.4 NMAC), (WQCC, 2012). Segments are defined in 20.6.4.7.S (2) NMAC:

> **"Segment"** means a classified water of the state described in 20.6.4.101 through 20.6.4.899 NMAC. The water within a segment should have the same uses, similar hydrologic characteristics or flow regimes, and natural physical, chemical and biological characteristics and exhibit similar reactions to external stresses, such as the discharge of pollutants.

Segments of the Mimbres are currently designated as a high-quality coldwater (HQCW) and coldwater (CW) ALUs in **20.6.4.804** NMAC and **20.6.4.803** NMAC, respectively. However, exceedences of temperature have historically occurred along these two segments (SWQB thermograph surveys of 1998, 2000 and 2003) including during the most recent water quality survey for the Mimbres River watershed in 2009 (NMED/SWQB, 2011a). The temperature criteria for ALUs in the New Mexico Water Quality Standards are listed in Table 2.

Table 2: Temperature Criteria (°C) for ALUs in New Mexico. Chronic temperature criteria (4T3, 6T3) are the temperatures not to exceed for a period of 4 or 6 hours on more than 3 consecutive days, respectively.

Criterion	High Quality Coldwater	Coldwater	Marginal Coldwater	Coolwater	Warmwater	Marginal Warmwater
4T3	20	-	-	-	-	-
6T3	-	20	25	-	-	-
T_{MAX}	23	24	29	29	32.2	32.2

A summary of thermograph statistics for the most-recent survey (2009) is shown below (Table 3a). Both acute (T_{MAX}) and chronic (4T3, 6T3, as appropriate) temperature criteria were exceeded in the two segments of the Mimbres river. In the lower Mimbres segment **20.6.4.803 NMAC**, the coldwater ALU temperature criteria were exceeded at Rancho del Rio (**45Mimbre062.7**) and at Royal John Bridge (**45Mimbre085.7**). Specifically, the data records from Rancho del Rio, the most downstream thermograph site, exceed the 6T3. The 6T3 criteria applicable to the CW ALU requires temperatures not exceed 20°C for more than six hours, for more than three consecutive days (20.6.4.7.A(2) NMAC). At the Rancho del Rio site, the 6T3 criteria was exceeded eight times during the 2009 thermograph campaign; this was consistent with findings at the same site during previous thermograph deployment in 2003 (Table 3b). At Royal John Bridge both the T_{MAX} and 6T3 coldwater ALU criteria were exceeded; the T_{MAX} exceeded 30 °C, and there were 28 exceedences of the 6T3.

The USGS Gage station (**45Mimbre104.3**) located at the lower end of segment 20.6.4.804 NMAC (and below the TNC property) was not measured in 2009; however this station exceeded the T_{MAX} during the 2003 thermograph survey (Table 3b). Four thermograph stations were deployed in 2009 from the lower TNC property north of the town of Mimbres, NM to the headwaters at Cooney Campground (**45Mimbre127.4**). The data were used to assess the high quality coldwater ALU for segment **20.6.4.804 NMAC.** In 2009, the station at Lower TNC preserve (**45Mimbre109.0**) was in exceedence of both the

T_{MAX} and the 4T3 criteria indicating that the Mimbres was unable to meet the high quality coldwater ALU criteria for both acute and chronic temperatures. The upper TNC preserve, McKnight canyon (sometimes referred to as the East Fork of the Mimbres) and Cooney Campground thermograph records were fully supportive of the HQCW designation.

Table 3a. Summary Statistics of Water Temperatures for the Mimbres River (2009)

Station ID	Location/Current Aquatic Life Designation (ALU)	Elevation	Reference date*	T_{MAX}	4T3	6T3
20.6.4.803	**Coldwater ALU**	**(ft)**		**°C**	**°C**	**°C**
45Mimbre062.7	Rancho del Rio	5,052	7/21/2009	23.3	NA	20.9
45Mimbre085.7	Royal John Bridge	5,453	7/27/2009	30.1	NA	24.1
45Gallin021.5	Gallinas Creek-Tributary of Mimbres	6,667		20.6	NA	17.4
20.6.4.804	**High Quality Coldwater ALU**					
45Mimbre109.0	Lower TNC Preserve on Mimbres	6,024	7/27/2009	24.6	24.6	NA
45McKnig011.9	McKnight Canyon-East Fork Mimbres	7,152		22.0	18.0	NA
45Mimbre127.4	Cooney Campground on Mimbres River	6,857		20.9	16.4	NA

Temperature readings in red indicate exceedence of the criterion, NA=Not Applicable, ND=No Data.

Table 3b. Summary Statistics of Water Temperatures for the Mimbres River (2003)

Station No.	Location/Current Aquatic Life Designation (ALU)	Elevation	Reference date	T_{MAX}	4T3	6T3
20.6.4.803	**Coldwater ALU**	**(ft)**		**°C**	**°C**	**°C**
45Mimbre062.7	Rancho del Rio	5,052	8/3/2003	29.1	NA	19.9
45Mimbre085.7	Royal John Bridge	5,453		ND	NA	ND
45Gallin021.5	Gallinas Creek-Tributary of Mimbres	6,667		ND	NA	ND
20.6.4.804	**High Quality Coldwater ALU**					
45Mimbre104.3	USGS Gage	5,920	8/1/2003	28.9	24.9	NA
45Mimbre109.0	Lower TNC Preserve on Mimbres	6,024	6/26/2003	29.7	22.5	NA
45Mimbre112.2	Upper TNC Preserve on Mimbres	6,155		18.6	16.7	NA
45McKnig011.9	McKnight Canyon-East Fork Mimbres	7,152		21.2	18.1	NA
45Mimbre127.4	Cooney Campground on Mimbres River	6,857		ND	ND	NA

Temperature readings in red indicate exceedence of the standard, NA=Not Applicable, ND=No Data.

An additional gauge of attainable conditions for the Mimbres River is the Maximum Weekly Average Temperature (MWAT) index. The MWAT is a measure of chronic temperature trends calculated from the average of daily temperature measurements, which are again averaged over the seven contiguous days of highest daily averages from the record. A chronic temperature index is commonly used to set standards for thermal regimes of streams (Oregon Department of Environmental Quality, 2004; Colorado Department of Public Health and Environment, 2011), and a great deal of comparative literature also exists relating MWAT in particular to thermal requirements of freshwater fish (Brungs and Jones, 1977). The MWAT can be applied in a flexible way, such as Colorado's criteria that address stream order, species present, and even seasonal limits on temperature based on spawning (Todd et al., 2008). Colorado's MWAT criterion for an equivalent stream (*i.e.,* CWAL) to the Mimbres is 18.2 °C, which itself is similar to the EPA guidance for salmonids (18°C). The MWAT calculated from 2009 thermograph data show that only three sites would achieve either thermal limit; Gallinas Creek, McKnight Canyon and Cooney Campground, which are all low-order tributaries of the Mimbres. New Mexico's water quality standards do not require the use of the MWAT for chronic temperature assessments; however because of its utility in identifying attainable uses as related to fish communities,

the SWQB has developed an Air-Water Temperature Correlation for New Mexico streams. This correlation, when compared with MWAT calculated from SWQB-deployed thermographs, allows for the calculation of chronic and acute temperature indices when and where data may not be available (NMED/SWQB, 2011). The advantage of the Air-Water Temperature Correlation is that other than in streams which receive significant groundwater inputs, air temperature has the greatest influence on stream temperature. Air temperatures, either modeled or measured, are more readily available and spatially representative than periodic and spatially limited stream temperature datasets. The Air-Water Temperature Correlation uses recorded thermograph data from 293 New Mexico stream locations and the Parameter-elevation Regression on Independent Slopes elevation Model (PRISM) that predicts air temperatures which can then be used to predict water temperatures (PRISM Climate Group, 2004). The New Mexico regression correlation results relate July average air temperatures to estimate attainable temperature statistics such as MWAT, but can also be used to estimate TMAX and chronic temperature indices (4T3, 6T3). Mimbres air temperature data for 2009 as well as the PRISM modeled air temperature are shown in Table 6 in appendix B for comparison of modeled and actual air temperatures. Briefly, PRISM-modeled air temperatures are within ± 1.6 degrees of the July average air temperature, and in no particular trend direction. This suggests microclimate differences and model errors may account for small error being included in the projection. The net recommendations of the Air-Water Temperature Correlation analyses for New Mexico streams are:

- High quality and coldwater uses may be attainable if July average air temperature is ≤18°C;
- Marginal coldwater and coolwater uses may be attainable if July average air temperature is >18°C and ≤23 °C; and
- Uses more restrictive than warmwater are generally not attainable if July average air temperature is >23°C.

The modeled MWAT, 4T3, 6T3 and T_{MAX} for Mimbres thermograph stations as well as the actual MWAT for the thermograph survey (2009) are shown in Table 3c.

Table 3c. Air-Water Temperature Correlation-modeled criteria for the Mimbres River.

Station ID	Location	Current Aquatic Life Use	July Average Air Temp, °C (PRISM)	MWAT 2009 Thermograph data	MWAT Modeled	4T3 modeled	6T3 modeled	TMAX modeled
	20.6.4.803							
45Mimbre062.7	Rancho del Rio	Coldwater	24.6	19.65	24.6	**NA**	**26.6**	31.3
45Mimbre085.7	Royal John Bridge	Coldwater	23.5	21.47	23.5	**NA**	**25.5**	30.1
45Gallin021.5	Gallinas Creek-Tributary of Mimbres	Coldwater	21.0	16.89	21.0	**NA**	**22.9**	27.4
	20.6.4.804							
45Mimbre109.0	Lower TNC Preserve on Mimbres	High Quality CW	22.2	19.62	22.2	**25.4**	**NA**	28.7
45McKnig011.9	McKnight Canyon-East Fork Mimbres	High Quality CW	20.5	16.09	20.5	**23.6**	**NA**	26.9
45Mimbre127.4	Cooney Campground on Mimbres River	High Quality CW	20.5	15.63	20.5	**23.6**	**NA**	26.9

The Air-Water Temperature Correlation-modeled MWAT values are similar to (Royal John Bridge, Lower TNC) or exceed the 2009 thermograph data-calculated MWAT. This trend of higher modeled MWAT values (in all cases) may have occurred for several reasons; (1) The PRISM record of July temperatures used in the model are averaged for the period 1981-2010. Averaging may smooth extremes

and trends in the modeled temperature record. This, in combination with interannual variation in the water temperature record (in this case, lower 2009 thermograph-generated MWAT) could lead to poor agreement with the modeled MWAT. (2) Bias in placement of the thermographs may also lead to lower values as compared to those modeled by the air-water temperature correlation. Namely, thermographs are placed in the sections of a stream to avoid being buried in silt, emergence during low flow, and believed to have consistent flow. Despite these provisos, both measured and modeled chronic (MWAT, 4T3, 6T3) and acute (T_{MAX}) temperature criteria suggest that the reach from Cooney canyon downstream to Upper TNC are not expected to attain HQCW ALUs and are sometimes challenged to attain the CW ALU (Tables 3a,c). For the reach downstream of the Upper TNC (excluding the Gallinas Creek tributary), the 2009 thermograph and modeled temperature criteria suggest that the CW ALU is not attainable and the T_{MAX} suggests Cool to Warmwater ALU transitions are likely to be more appropriate and attainable.

Geomorphology of the Mimbres River Basin

In general, the ecoregional setting, highly drained soils and sediments, natural sinuosity, and frequent departure from sparse riparian vegetation in the Mimbres River basin promote high water temperatures. As streams progress from headwater seeps, to low order streams, and then to rivers, physical changes occur that define the biota. Small streams are in intimate contact with the parent lithology and exhibit physical properties under strong influences of their ground water origins. In low order streams, emergent ground water temperature and the nature of the riparian flora strongly moderate temperatures. As streams move through the landscape, they generally increase in size and flow, widen, and the riparian shading becomes less of an influence on insolation (*i.e.*, solar radiation). Stream physico-chemical characteristics are a result of multiple water sources (springs and tributaries), the changing geology, and the influence of allochthonous and autochthonous productivity.

The Mimbres River headwaters arise from north of the town of Mimbres, and flow through deep incised canyons with narrow, forested riparian zones, which keep waters relatively cool (Fig 2a). However, as the river progresses from AZ/NM Subalpine Forests (23d) through Montane Conifer Forests (23c) to the Madrean Lower Montane Woodlands (23b); the stream physiognomy adopts a typical meandering river valley and has an active channel that is often underfitting the total channel width which it can occupy during times of flood (Figures 2b, 2c, and 2d; elevations in Table 3a). Snowmelt, high flow events, and sedimentation can significantly change the flow path of the middle to lower sections of the Mimbres River and present challenges to development of a persisting, shading riparian community. The SWQB uses these geomorphic, stream channel, and riparian community features to establish Assessment Units (AU) within segments to capture the changing topography and thus influences to water quality (20.6.4.7.S (2) NMAC).

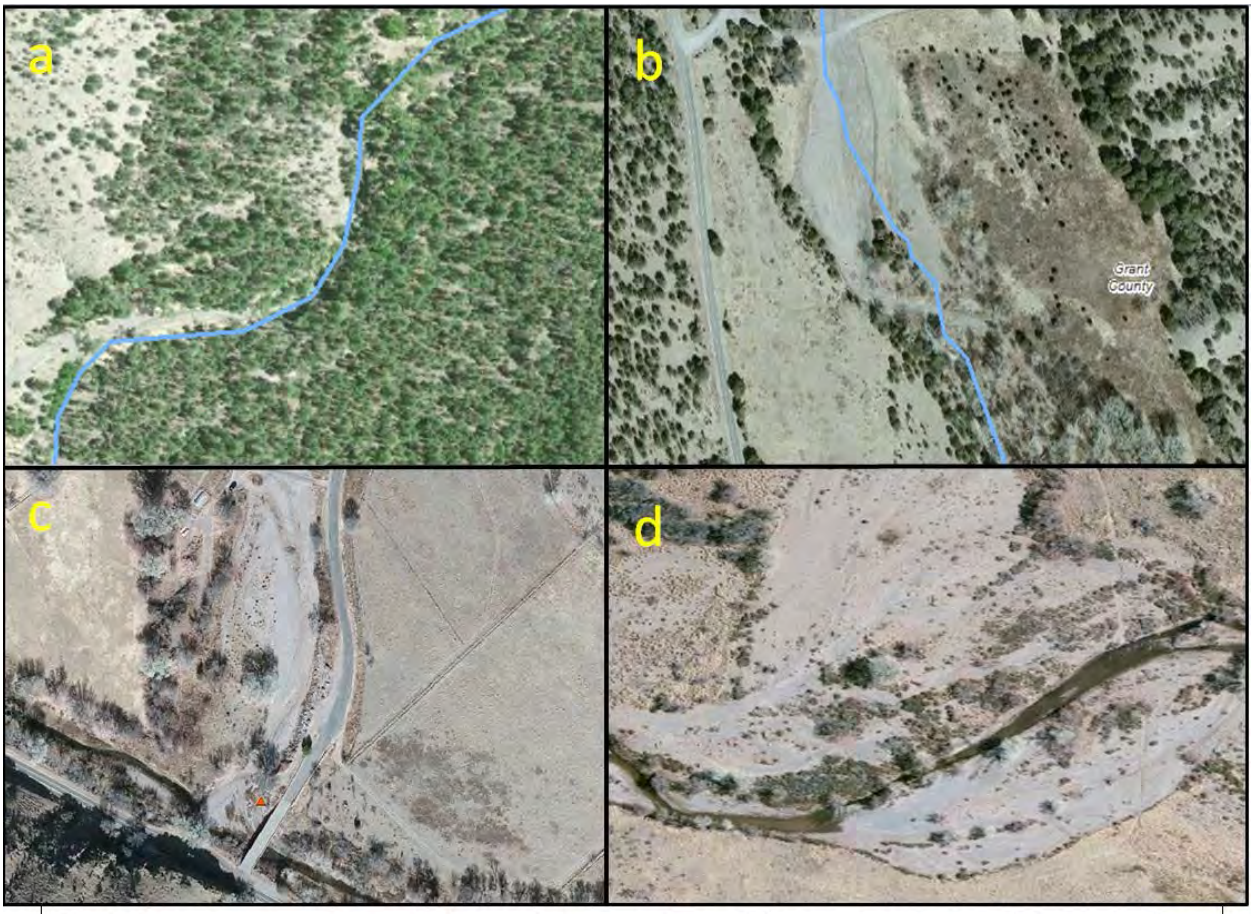


Fig 2. Stream course morphology of the Mimbres. (a) Cooney Canyon, (b) Lower TNC (c) Royal John bridge and (d) Rancho del Rio

AUs are designed to represent surface waters with homogenous water quality (WERF 2007), however, natural changes to landscape features within an AU occur along a continuum and thus changes to water quality can occur within an AU. Once the Mimbres River reaches the valley floor (below Cooney Canyon), and flows into the Madrean Lower Montane Woodlands ecoregion (23b), it adopts a meandering character. The riparian flora shades only small fractions of the active channel, and even when present, these riparian areas are often abandoned when the river migrates (meanders) to a new flowpath or channel. Development of shading riparian flora is also challenged by the nature of soil and sediment present in the watershed that may limit water storage available to support plant growth. The sediments in the middle to lower Mimbres are a loose, porous, unconsolidated Quaternary alluvium and contain gravels and sand that are many hundreds of feet thick in places (Heywood 2002). Major soil units of the upland, valley floor, and basin Mimbres valley beginning two miles downstream of the McKnight canyon confluence with the Mimbres are shown in Table 4. Drainage classes listed for soil within the basin are all *well* to *excessively well drained* and thus water may be lost rapidly from the rooting zone. Available Water Storage (AWS) is a measure of water storage capacity to support plant growth and is defined as the magnitude of the difference between field capacity (the maximum amount of water a soil can hold against gravity) and the wilting point (the amount of soil moisture below which plants wilt and die) (USDA NRCS, 2005). According to the AWS drainage classifications, most Mimbres valley soils have a limited

capacity to store water in support of plant growth; however porous soils may be advantageous in areas where the water table is proximal to the rooting zone (Table 4).

Table 4. Major soil units of the Mimbres valley, their geomorphic positions, drainage classes, and water storage availability (AWS) to support plant growth. AWS <25 cm indicates soils prone to drought and challenging to plant growth.

Major Upland Soil Units	Geomorphic Position	Drainage Class	Available Water Storage (cm, 1-100)
Lonti-Ustorthents	Summits and Shoulders	Well drained	11.84
Sanloren-Majada Var.	Terraces, Ridges, Backslopes	Well drained	11.70
Guy	Hillslope/Footslopes	Well drained	9.97
Muzzler	Hills/Toeslope	Well drained	3.41
Major Valley Floor Units			
Carnero-Santa Fe	Hillslopes/Footslopes	Well drained	10.05
Paymaster-Ellicott-Monzano	Alluvial fans	Well drained	12.20
Manzano	Valley floors	Well drained	18.84
Major Basin and Range Units			
Riverwash	Valley floors	Well drained	3.00
Stellar	Basin floors/footslopes	Well drained	15.52
Mimbres	Stream terraces	Well drained	19.96
Arizo-Vinton	Terraces/Alluvial fans	Excessively well drained	5.94

Historical and Current Observations of Aquatic Life in the Mimbres River

Another approach to determining the proper attainable aquatic life use is to understand the thermal preferences of the biological assemblages therein (Lyons 1996, Wehrly et al., 2003). To avoid the circular argument that current biological assemblages define the stream, and the possibility that changes in the thermal regime may have selected for the current assemblage, it is important, whenever possible, to determine the historical assemblages present in the water body under consideration. The earliest records for Mimbres fish communities date to 1944 and there have been periodic samplings along much of the perennial reaches in the decades since. Historical data compiled by the University of New Mexico, Museum of Southwestern Biology (MSB/UNM, 2013) indicate that three to five species of fish can be considered native to the watershed. These include beautiful shiner (*Cyprinella formosa*), the federally-listed Chihuahua chub (*Gila nigrescens*), Rio Grande sucker (*Pantosteus plebeius*) and fathead minnow (*Pimephales promelas*). Of these, beautiful shiner has been recorded as extirpated (last encountered in a 1950 collection, Sublette et al., 1990) and fathead minnow was recorded only once in recent surveys, in 1989 (MSB, 2013). Rio Grande sucker and Chihuahua chub have been recorded often from 1947 to the present and their historical presence and thermal preferences, along with several successful introduced

species (rainbow trout and longfin dace) are shown in Tables 5a and 5b (Sublette et al., 1990). Of the native fish species currently or historically found in the Mimbres basin, all are either coolwater (sometimes termed "intermediate") or warmwater species (Sublette and Hatch, 1990; Zaroban et al., 1999; Minckley, 1973; Schiffmiller, pers comm).

Table 5a. Historical Native Fish Fauna of the Mimbres Drainage

Genus/species	Common name	Extant	Thermal Preference
Cyprinella formosa	Beautiful shiner	extirpated[b]	Warmwater
Gila nigrescens	Chihuahua chub	yes	Coolwater
Pimephales promelas	Fathead minnow	unlikely	Warmwater
Pantosteus plebeius	Rio Grande sucker[a]	yes	Coolwater
Cyprinodon sp.	Pupfish sp	unlikely	Warmwater

[a]Stable in Mimbres River [b]Jelks et al., 2008, Pittenger 1997.

Table 5b. Historical non-native fish fauna of the Mimbres Drainage

Genus/species	Common name	Extant	Thermal Preference
Oncorhynchus gilae	Gila trout[a]	East Mimbres	Coldwater
Oncorhynchus mykiss	Rainbow trout[b]	yes	Coldwater
Salmo trutta	Brown trout	maybe	Coldwater
Agosia chrysogaster	Longfin dace[c]	yes	Warmwater
Rhinichythys osculus	Speckled dace[d]	yes	Coolwater
Ictalurus punctatus	Channel catfish	unlikely	Warmwater
Lepomis cyanellus	Green sunfish[e]	unlikely	Warmwater
Lepomis macrochirus	Bluegill	unlikely	Warmwater
Lepomis megalotis	Longear sunfish	unlikely	Warmwater
Micropterus salmoides	Largemouth bass	unlikely	Warmwater
Pomoxis annularis	White crappie	unlikely	Warmwater

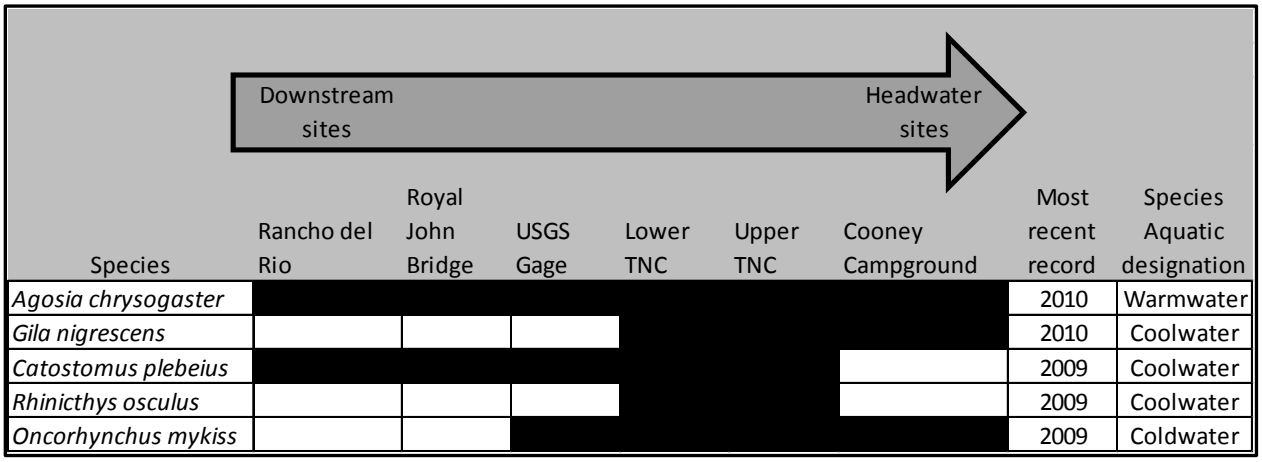
[a]Transplants to East Mimbres, a tributary of the Mimbres, as a replicated population from the nearby Gila basin for conservation management
[b]Introduced to all major drainages in New Mexico; in Mimbres by 1949 (Koster)[c]Introduced to the Mimbres in the 1960s; established.
[d]Introduced to the Mimbres in the 1970s
[e]Introduced into the Mimbres prior to 1950

Of the sixteen native, introduced, and transplanted species encountered in the historical record, only five appear with regularity in recent surveys (2009, 2010; Figure 3). Extant native species include Chihuahua chub and Rio Grande sucker. Non-native species that appear to be successfully established in the Mimbres River include longfin dace (*Agosia chrysogaster*), speckled dace (*Rhinichthys osculus*) and rainbow trout (*Oncorhynchus mykiss*). Other fish in the historical record (sunfish, bass, and catfish) occur occasionally and should be considered unlikely as reproducing populations due to unsuccessful introductions, or as escapes from Bear Canyon Reservoir. The most abundant species in SWQB's 2002 and 2009 survey data are listed in Table 5c by sampling station, however, a longer term record showing species distributions across additional sites compiled by SWQB and the MSB/UNM is shown in Figure 3.

Table 5c. Species richness (no. of species observed), abundance (no. of individuals observed), dominant species and species aquatic designation for Mimbres basin fish as compiled by SWQB.

Station Name	Year	Species Richness	Abundance	Dominant Sp*.	Sp Aq Des**
Rancho del Rio	2002	2	1,949	*A. chrysogaster*	Warmwater
Rancho del Rio	2009	2	533	*C. plebeius*	Coolwater
USGS Gage	2002	3	322	*A. chrysogaster*	Warmwater
Lower TNC	2002	5	271	*C. plebeius*	Coolwater
Upper TNC	2009	5	89	*O. mykiss*	Coldwater
McKnight canyon Trib	2002	1	2	*O. mykiss*	Coldwater

*Sp. =Species **Sp Aq Des=Species Aquatic Designation/Thermal Preference



Species	Rancho del Rio	Royal John Bridge	USGS Gage	Lower TNC	Upper TNC	Cooney Campground	Most recent record	Species Aquatic designation
Agosia chrysogaster	■	■	■	■	■	■	2010	Warmwater
Gila nigrescens				■	■	■	2010	Coolwater
Catostomus plebeius	■	■	■	■	■		2009	Coolwater
Rhinicthys osculus				■	■		2009	Coolwater
Oncorhynchus mykiss			■	■	■	■	2009	Coldwater

Solid bar indicates presence of species in the assessment unit

Figure 3. Fish species distribution in the Mimbres River.

The most current assessments of fish present in the Mimbres River show that the introduced rainbow trout is able to persist in the upper reaches, but also can be found in segments of the stream that exceed both acute and chronic temperature criteria for coldwater use. This suggests that refugia from high temperatures may exist in the river, that allow trout to escape or tolerate these temperatures, or that rainbow trout may move in and out of less optimal habitat as a result of numerous pressures including competition, opportunity, or are washed into these areas during high flow events. Other fish species documented in the Mimbres River basin, whether native or introduced, are either coolwater or warmwater species (Sublette and Hatch, 1990; Zaroban et al., 1999; Minckley, 1973; Schiffmiller, pers comm). With the exception of speckled dace and Chihuahua chub, these other species are found in more of the AUs than trout. This indicates that a significant thermal gradient exists supporting both native cool- and warmwater communities, while the streams provide refugia for the introduced coldwater rainbow trout.

Records indicate that rainbow, Gila, and brown trout have been reported for the Mimbres River, with rainbows being the most consistently reported throughout the historical record and in both segments. Brown trout are rarely reported and they, along with Gila trout, have only been reported in the upper reaches of the Mimbres (Cooney and McKnight Canyons, respectively; segment 20.6.4.804 NMAC). Data indicate segment 20.6.4.804 can support a coldwater fishery in its upper reaches; however, the suitability of waters rapidly changes in the lower part of the segment. In order to better understand the potential for success of coldwater fish, size classes of fish in the upper and lower segments of the Mimbres River were evaluated. A variety of size classes within a species (*e.g.*, young-of-the-year and/or juvenile fish in addition to adults present) would likely indicate a successfully reproducing population. The analysis showed that there are at least two distinct habitat zones broadly consistent with the current segment assignments. However, these zones are not consistent with their currently assigned aquatic life uses. The warmwater longfin dace was present in both segments in high numbers, and in size classes indicating a reproducing population tolerant of a wide range of stream temperatures. Coolwater species, Chihuahua chub and Rio Grande sucker, were also found in multiple size classes, however mostly relegated to the upper and lower Mimbres segments, respectively. Conversely, the coldwater rainbow trout was only found in significant numbers and size classes in the upper reaches of the Mimbres. The size class range, thermal preferences, and abundance of fish in the lower segment of the Mimbres River are shown in Figure 4. Only adult rainbow trout (and very few of them) were found in the survey just south of the town of Mimbres.

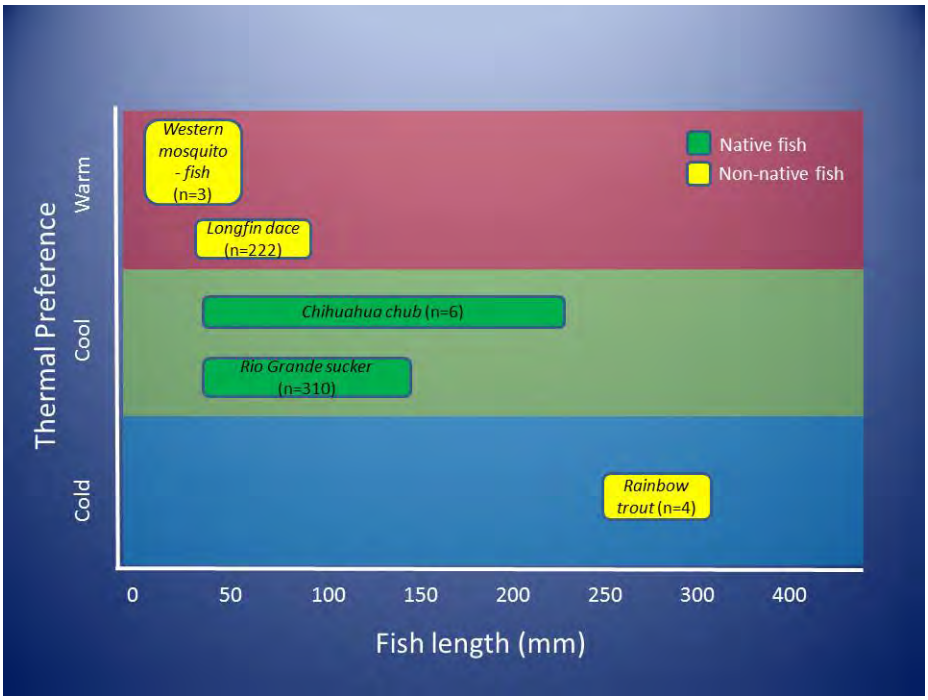


Figure 4. Fish size classes and thermal preferences in the upper part of segment 20.6.4.803. New Mexico Game and Fish 2013 survey. Conclusion: very few Rainbow trout, all adults, were found in this reach. ["n" is the number of fish captured in the survey].

Discussion

From its headwaters to its mouth, the Mimbres River moves from moderately high elevation, deeply incised canyons to the Guzman basin; a drop in elevation spanning approximately 2,000 feet (610 m) and traverses five ecoregions. The variations in the geomorphology along this gradient produce significant changes in the water quality. Once the Mimbres River reaches the valley floor, crossing from the Montane Conifer Forests ecoregion (23c) into the Madrean Lower Mountain Forest ecoregion (23b), its latitude, elevation, meandering course, widening river valley, and well-drained soil and sediments become limiting influences on riparian vegetation and shading, resulting in naturally occurring higher temperatures downstream of the upper Nature Conservancy property.

There are significant natural and geomorphic influences affecting attainable ALUs in the Mimbres River. The natural migration of the river on the valley floor and seasonal flooding has led to the development and subsequent abandonment of associated riparian flora. The fluvial geomorphology can be examined by way of aerial imagery (*e.g.,* Google Earth) and the numerous abandoned meanders suggest that the Mimbres River has an active channel that changes frequently. Although riparian woody species may be well adapted to flood regimes, channel morphological changes because of flooding create riparian abandonment, affecting the Mimbres River and attainable temperature regimes. Soils along the Mimbres are highly porous, drain quickly, and may limit the development of a persistent riparian zone due to a poor water storage potential to support plant growth. Generally, the ecological setting of the mid to lower Mimbres (moderate elevations and latitude) presents challenges in an environment where air temperatures and insolation (solar irradiation) are the most important influences upon water temperature.

Air-water temperature modeling (*e.g.,* SWQB's Air-Water Temperature Correlation for New Mexico streams) suggests that the coldwater aquatic life use is not attainable throughout large sections of the

Mimbres River, even in the highest elevation ecological zone, the Subalpine Forests (23d), where trout populations are currently known to reproduce. It appears that spring-fed cold water, and/or refugia exist in the headwaters/upper portion of the Mimbres River, and pending further fish population studies and thermograph data collections, the current ALU designation is attainable despite occurrences of high air temperatures. It is recommended that a new headwater segment, 20.6.4.807 NMAC, from Cooney Canyon to the headwaters of the Mimbres and all perennial reaches thereto, which would remain HQCW, be established. In addition, the tributary East Fork Mimbres (also known as McKnight creek) should be placed as HQCW in the segment 20.6.4.807 for perennial reaches above the fish barrier. However, as the Mimbres transitions from ecoregion 23c to 23b, the naturally intermittent nature of the upper-to-mid portion of the Mimbres River is prone to flash floods, exacerbated by occurrence of historic disturbances such as fires, indicate that HQCW is not attainable, and that perennial reaches below the Cooney Canyon confluence with the East Fork Mimbres River should be designated as CW ALU is more appropriate. Below the fish barrier, the East Fork Mimbres should also be considered CW aquatic life use to its confluence with the similarly designated segment of the mainstem Mimbres River.

Historically, as now, the Mimbres River has supported a small diversity of fish species, one that has been changed significantly by extirpations and introductions. The Mimbres River downstream of the confluence with McKnight Canyon has supported three warmwater and two coolwater fish species whereas currently, it supports one warmwater, three coolwater and one coldwater species. Modeling of the air-water temperature relationship and the natural conditions of air temperature and the fluvial geomorphology of the Mimbres River demonstrate that the attainable aquatic life use for this section is coolwater below the Upper TNC property (Allie canyon) with a segment-specific 30°C temperature, which is consistent with both historical and current fish communities (Figure 5).

Aquatic Life Use (ALU) Recommendations

Cooney Canyon to the headwaters of the Mimbres River, including all perennial tributaries from the 23d ecoregion (Subalpine Forests), should remain designated as High Quality Coldwater ALU. A new segment extending from Allie Canyon to Cooney canyon (the "Middle Mimbres") should be re-designated as Coldwater ALU, and a segment from Allie Canyon to the mouth re-designated as Coolwater ALU with a segment-specific temperature criterion of 30°C (Figure 5). While survey year 2009 was a lower flow as compared to the 30 year mean (USGS 08477110 MIMBRES RIVER AT MIMBRES, NM), interannual variation in flows, and both the 2003 and 2009 temperature dataset suggest that the 29°C criteria associated with coolwater ALU will not be attainable and a segment-specific criteria of 30°C is more appropriate. Therefore, the following changes to the water quality standards are recommended:

20.6.4.803 CLOSED BASINS - Perennial reaches of the Mimbres River downstream of the confluence with ~~Willow Springs~~ Allie canyon and all perennial reaches of tributaries thereto.

A. Designated Uses: coolwater aquatic life with a segment-specific temperature of 30°C, irrigation, livestock watering, wildlife habitat and primary contact.

20.6.4.804 CLOSED BASINS - Perennial reaches of the Mimbres River upstream of the confluence with ~~Willow Springs~~ Allie canyon upstream to Cooney canyon, and all perennial reaches of East Fork Mimbres (McKnight Canyon) below the fish barrier, and perennial tributaries thereto.

A. Designated Uses: irrigation, domestic water supply, coldwater aquatic life, livestock watering, wildlife habitat and primary contact.

20.6.4.807 CLOSED BASINS - Perennial reaches of the Mimbres river upstream of Cooney Canyon and all perennial reaches thereto, including perennial reaches of East Fork Mimbres river (McKnight Canyon) above the fish barrier.

A. Designated Uses: irrigation, domestic water supply, high quality coldwater aquatic life, livestock watering, wildlife habitat and primary contact.

Figure 5. Map of recommended segments and attainable uses for the Mimbres watershed. Ecoregion assignments and attributes are listed in Table 1.

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Appendix A

Representative photos of the Mimbres River and tributaries showing stream course and riparian character.

Figure legends:

Figure A. Royal John Bridge, Segment 20.6.4.803. (upstream view). Note sparse riparian flora, wide meandering channel.

Figure B. USGS Gage site, Segment 20.6.4.803 (upstream view).

Figure C. McKnight (L) confluence with the Mimbres (R), Segment 20.6.4.804, (downstream view). Note wide, open meandering channels and sparse riparian cover.

Figure D. Middle TNC Property, Segment 20.6.4.804, downstream view. Note improved riparian cover, ample channel shading from primary canopy, but poor secondary canopy and riparian flora.

Figure E. Cooney Campground, Segment 20.6.4.804 Note significant channel shading from primary canopy, but poor secondary canopy and riparian flora.

Fig A Royal John Bridge, Segment 20.6.4.803 (upstream view)

Fig B. USGS Gage site, Segment 20.6.4.803 (upstream view)

Fig C. McKnight (L) confluence with the Mimbres (R), Segment 20.6.4.804, downstream view

Fig D. Middle TNC Property, Segment 20.6.4.804, downstream view

Fig E. Cooney Campground, Segment 20.6.4.804

Appendix B

Table 6: A comparison of PRISM predicted air temperatures and SWQB's air temperature from thermographs deployed in 2009 and National Climate Data Center's (NCDC) long term normal temperatures for July.

Station ID	Location	Elevation	July Average Air Temp
20.6.4.803	**Coldwater ALU**	**(ft)**	**°C**
45Mimbre062.7	Rancho del Rio (PRISM)	5,052	24.6
45Mimbre062.8	Rancho del Rio (2009 AIR)	5,052	25.5
Faywood, NM	NCDC 1981-2010 Normals (AIR)	5,190	24.3
45Mimbre085.7	Royal John Bridge (PRISM)	5,453	23.5
20.6.4.804	**High Quality Coldwater ALU**		
45Gallin021.5	Gallinas Creek-Trib (PRISM)	6,667	21.0
Mimbres Ranger Stn	NCDC 1981-2010 Normals	6,240	21.1
45Mimbre109.0	Lower TNC on Mimbres (PRISM)	6,024	22.2
45McKnig011.9	McKnight Canyon (PRISM)	7,152	20.5
45Mimbre127.4	Cooney Campground (PRISM)	6,857	20.5
45Mimbre127.4	Cooney Campground (2009 AIR)	6,857	18.9