NOTICES OF PROPOSED RULEMAKING

Unless exempted by A.R.S. § 41-1005, each agency shall begin the rulemaking process by first submitting to the Secretary of State's Office a Notice of Rulemaking Docket Opening followed by a Notice of Proposed Rulemaking that contains the preamble and the full text of the rules. The Secretary of State's Office publishes each Notice in the next available issue of the *Register* according to the schedule of deadlines for *Register* publication. Under the Administrative Procedure Act (A.R.S. § 41-1001 et seq.), an agency must allow at least 30 days to elapse after the publication of the Notice of Proposed Rulemaking in the *Register* before beginning any proceedings for making, amending, or repealing any rule. (A.R.S. §§ 41-1013 and 41-1022)

NOTICE OF PROPOSED RULEMAKING

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 24. BOARD OF PHYSICAL THERAPY

[R08-84]

PREAMBLE

1. Sections Affected — **Rulemaking Action**

Sections Affected	Rulemaking Action
R4-24-201	Amend
R4-24-203	Amend
R4-24-204	Amend
R4-24-207	Amend
R4-24-208	Amend
Article 3	Amend
R4-24-301	Amend
R4-24-302	Amend
R4-24-304	Renumber
R4-24-304	New Section
R4-24-305	Renumber
R4-24-305	Amend
R4-24-306	Renumber
R4-24-306	Amend
R4-24-307	Renumber
R4-24-307	Amend
R4-24-308	Renumber
R4-24-308	Amend
R4-24-309	Renumber
R4-24-309	Amend
R4-24-310	Renumber
R4-24-310	Amend
R4-24-311	Amend
R4-24-312	New Section

2. The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statute: A.R.S. § 32-2003(5)

Implementing statute: A.R.S. §§ 32-32-2003(4) and (7), 32-2041(B), 32-2042, 32-2044, 32-2045, 32-2046, and 32-2051

3. List of all previous notices appearing in the *Register* addressing the proposed rules:

Notice of Rulemaking Docket Opening: 13 A.A.R. 311, February 9, 2007

4. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Heidi Herbst Paakkonen, Executive Director

Address: Board of Physical Therapy
4205 N. 7th Ave., Suite 208
Phoenix, AZ 85013

Telephone: (602) 274-0236

Fax: (602) 274-1378

E-mail: Heidi.herbst-paakkonen@ptboard.state.az.us

5. An explanation of the rules, including the agency's reasons for initiating the rulemaking:

This rulemaking relates, in part, to a five-year-review report approved by the Council in October 2004. The Board is amending its rules to make them more clear, concise, and understandable and consistent with statute and current agency practice. It is adding a rule regarding standards for adequate patient records and is amending rules to address the requirement that the Board determine that an individual is qualified to receive a public benefit before issuing a license to the individual. The Board is adding the requirement that an applicant whose first language is not English pass an English-proficiency test within 18 months before the date on which the application is administratively complete.

6. A reference to any study relevant to the rule that the agency reviewed and proposes either to rely on or not to rely on in its evaluation of or justification for the rule, where the public may obtain or review each study, all data underlying each study, and any analysis of each study and other supporting material:

None

7. A showing of good cause why the rules are necessary to promote a statewide interest if the rules will diminish a previous grant of authority of a political subdivision of this state:

Not applicable

8. The preliminary summary of the economic, small business, and consumer impact:

The costs associated with determining whether an individual is qualified to receive a public benefit arise from legislative action rather than this rulemaking. Licensees and certificate holders have always been required to maintain patient records. The new standards for patient records may impose minimal costs on licensees and certificate holders. However, the new standards will provide protections for both patients and licensees and certificate holders.

9. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:

Name: Heidi Herbst Paakkonen, Executive Director

Address: Board of Physical Therapy
4205 N. 7th Ave., Suite 208
Phoenix, AZ 85013

Telephone: (602) 274-0236

Fax: (602) 274-1378

E-mail: Heidi.herbst-paakkonen@ptboard.state.az.us

10. The time, place, and nature of the proceedings for the making, amendment, or repeal of the rules or, if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rules:

An oral proceeding regarding the proposed rules will be held as follows:

Date: Wednesday, May 7, 2008

Time: 8:30 a.m.

Location: 1400 W. Washington St., Room B-1
Phoenix, AZ

The rulemaking record will close at 5:00 p.m. on Friday, May 16, 2008.

11. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

None

12. Incorporations by reference and their location in the rules:

None

13. The full text of the rules follows:

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 24. BOARD OF PHYSICAL THERAPY

ARTICLE 2. LICENSING PROVISIONS

Section
R4-24-201. Application for a Physical Therapist License
R4-24-203. Foreign-educated Applicant Requirements
R4-24-204. Supervised Clinical Practice
R4-24-207. Application for a Physical Therapist Assistant Certificate
R4-24-208. License or Certificate Renewal; Address Change

ARTICLE 3. ~~REGULATION~~ PRACTICE OF PHYSICAL THERAPY

Section
R4-24-301. Lawful Practice
R4-24-302. Use of Titles
R4-24-304. Adequate Patient Records
~~R4-24-304.~~ R4-24-305. Complaints and Investigations
~~R4-24-305.~~ R4-24-306. ~~Informal Interviews~~ Hearings
~~R4-24-306.~~ R4-24-307. ~~Issuance of~~ Subpoenas
~~R4-24-307.~~ R4-24-308. Rehearing or Review of Board Decisions
~~R4-24-308.~~ R4-24-309. Disciplinary Actions~~; Penalties~~
~~R4-24-309.~~ R4-24-310. ~~Expired~~ Substance Abuse Recovery Program
R4-24-311. Display of License; ~~Posting Notice;~~ Disclosure
R4-24-312. Mandatory Reporting Requirement

ARTICLE 2. LICENSING PROVISIONS

R4-24-201. Application for a Physical Therapist License

A. No change
1. No change
   a. No change
   b. No change
   c. No change
   d. No change
   e. No change
   f. No change
   g. No change
   h. No change
   i. No change
   j. No change
   k. No change
   l. No change
   m. No change
   n. No change
   o. No change
   p. No change
   q. No change
2. A passport photograph of the applicant no larger than 1 1/2 x 2 inches that was taken not more than six months before the date of the application; ~~and~~
3. A completed Arizona Statement of Citizenship and Alien Status for State Public Benefits, which is a form available from the Board; and
~~3.~~4. The fee required in R4-24-107.

B. No change
1. No change
2. No change
3. No change

C. No change
1. No change
2. No change
   a. No change
   b. No change
   c. No change
   d. No change

e. No change
f. No change

D. No change

R4-24-203. Foreign-educated Applicant Requirements

A. No change
1. No change
2. No change
   a. No change
   b. No change
      i. No change
      ii. No change
      iii. No change
3. No change
   a. No change
   b. No change
   c. No change
4. If English is not the native language of the foreign-educated applicant, to meet the requirements in A.R.S. § 32-2022(B)(6), the applicant shall pass either of the following tests no more than 18 months before the date on which the application submitted under R4-24-201 is administratively complete and ensure that the test scores are sent directly to the Board by the testing entity:
   a. ~~If the applicant passed the~~ ~~following ETS tests~~ ~~before September 30, 2005~~ The TOEFL. An applicant who takes the TOEFL passes with the following:
      i. ~~TOEFL with a~~ A score of 560 or more if a paper-based test or ~~with~~ a score of 220 or more if a computer-based test;
      ii. No change
      iii. No change
   b. ~~After September 30, 2005,~~ ~~the~~ The iBT. An applicant who takes the iBT passes with an overall test score of a minimum of 100 and a:
      i. No change
      ii. No change
      iii. No change
      iv. No change
5. No change
6. No change

B. No change
1. No change
   a. No change
   b. No change
   c. No change
2. No change
   a. No change
   b. No change
   c. No change
   d. No change

R4-24-204. Supervised Clinical Practice

A. No change
B. No change
1. No change
   a. No change
   b. No change
2. No change

C. No change
1. No change
2. No change

D. An onsite supervisor shall:
1. Observe the interim permit holder during the supervised clinical practice and:
   a. Rate the interim permit holder's performance, at both the mid-point and completion of the clinical practice, ~~in~~ on

each of the clinical performance criteria in the Physical Therapist Clinical Performance Instrument or Physical Therapist Assistant Clinical Performance Instrument, including the dates and hours the onsite supervisor provided onsite supervision; ~~and~~

b. Recommend following the mid-point rating whether the interim permit holder be allowed to continue the clinical practice and changes needed, if any, to ensure successful completion of the clinical practice; and

~~b.~~c. Recommend ~~that~~ following the completion rating whether the interim permit holder be licensed or required to complete further supervised clinical practice; and

2. Submit the ~~completed~~ ratings on the Physical Therapist Clinical Performance Instrument or Physical Therapist Assistant Clinical Performance Instrument to the Board as follows:
   a. No later than the 55th day of the clinical practice for the mid-point rating, and
   b. ~~no~~ No later than 30 days after the ~~completion date~~ end of the supervised clinical practice for the completion rating.

E. After the Board receives the mid-point rating on the Physical Therapist Clinical Performance Instrument or Physical Therapist Assistant Clinical Performance Instrument, the Board shall review the rating and recommendation of the onsite supervisor and decide whether to allow the interim permit holder to continue the clinical practice or make changes in the clinical practice.

~~**E.**~~**F.** After the Board receives the ~~completed~~ completion rating on the Physical Therapist Clinical Performance Instrument or Physical Therapist Assistant Clinical Performance Instrument, the Board:

1. No change
   a. No change
   b. No change
   c. No change
2. No change
   a. No change
   b. No change
3. No change
   a. No change
   b. No change

~~**F.**~~**G.** No change

R4-24-207. Application for a Physical Therapist Assistant Certificate

A. No change

1. No change
   a. No change
   b. No change
   c. No change
   d. No change
   e. No change
   f. No change
   g. No change
   h. No change
   i. No change
   j. No change
   k. No change
   l. No change
   m. No change
   n. No change
   o. No change
   p. No change
2. A passport photograph of the applicant no larger than 1 1/2 x 2 inches that was taken not more than six months before the date of the application; ~~and~~
3. A completed Arizona Statement of Citizenship and Alien Status for State Public Benefits, which is a form available from the Board; and

~~3.~~4. The fee required in R4-24-107.

B. No change

1. No change
2. No change
3. No change

C. No change

1. No change
2. No change
   a. No change
   b. No change
   c. No change
   d. No change
   e. No change
   f. No change

D. No change

R4-24-208. License or Certificate Renewal; Address Change

A. No change
1. No change
   a. No change
      i. No change
      ii. No change
      iii. No change
   b. No change
   c. No change
   d. No change
   e. No change
   f. No change
   g. No change
   h. No change
   i. No change
   j. No change
   k. No change
      i. No change
      ii. No change
      iii. No change
   l. No change
      i. No change
      ii. No change
      iii. No change
   m. No change
   n. No change
   o. No change
2. The signature of the applicant attesting to the truthfulness of the information provided by the licensee or certificate-holder; ~~and~~
3. A completed Arizona Statement of Citizenship and Alien Status for State Public Benefits, which is a form available from the Board; and

~~3.~~4. The fee required by the Board in R4-24-107.

B. No change

C. No change
1. No change
2. No change

D. No change

E. No change

ARTICLE 3. ~~REGULATION~~ PRACTICE OF PHYSICAL THERAPY

R4-24-301. Lawful Practice

A. A physical therapist shall provide the referring practitioner, if any, with information from the patient assessment, diagnosis, and plan of care. ~~A~~ Within one week after a patient is initially evaluated, the physical therapist shall provide this information~~, verbally or in writing, after a patient is initially evaluated~~:
1. In writing and place a copy of the written notice in the patient's record; or
2. Orally and place a contemporaneously made note of the verbal communication in the patient's record.

B. A physical therapist shall maintain the confidentiality of patient records ~~in accordance with A.R.S. Title 12, Chapter 7~~ as required by federal and state law.

C. On written request by a patient or the patient's health care decision maker, a physical therapist shall provide access to or a

copy of the patient's medical or payment record in accordance with A.R.S. § 12-2293.

~~C.~~**D.** A physical therapist shall ~~obtain a patient's informed consent before treatment. The consent shall be in writing or documented in the patient chart and include:~~ respect a patient's right to make decisions regarding the recommended plan of care including the right to modify or refuse the care. A physical therapist shall obtain a patient's informed consent before beginning a therapeutic intervention. A physical therapist shall ensure that the patient provides consent in writing or contemporaneously document the consent in the patient's record. For consent to be informed, a physical therapist shall explain to a patient:

~~1. The nature of the proposed intervention,~~
~~2. Material risk of harm or complication,~~
~~3. A reasonable alternative to the proposed intervention, and~~
~~4. The goal of treatment.~~
1. Findings regarding the patient's examination, evaluation, diagnosis, and prognosis;
2. The nature of the proposed therapeutic intervention;
3. The goal of the proposed therapeutic intervention;
4. Risks associated with the proposed therapeutic intervention that a reasonable person would want to know before deciding to engage in the proposed therapeutic intervention; and
5. The alternatives to the proposed therapeutic intervention including the right to select another physical therapy provider.

R4-24-302. Use of Titles

A. ~~A licensed~~ As required under A.R.S. § 32-2042, a licensed physical therapist shall use the designation ~~"PT"~~ "P.T." immediately following the licensee's name or signature to denote licensure. A licensed physical therapist shall not use the designations ~~"RPT" and "LPT"~~ "R.P.T." or "L.P.T." in connection with the physical therapist's name or place of business.

B. In addition to and immediately following the "P.T." designation, a physical therapist may list academic degrees earned and professional specialty certifications held.

~~B.~~**C.** ~~A certified~~ As required under A.R.S. § 32-2042, a physical therapist assistant shall use the designation ~~"PTA"~~ "P.T.A." immediately following the physical therapist assistant's name to denote certification.

R4-24-304. Adequate Patient Records

A. A physical therapist shall ensure that a patient record meets the following minimum standards:
1. Each entry in the patient record is:
   a. Legible,
   b. Accurately dated, and
   c. Signed with the name and legal designation of the individual making the entry;
2. If an electronic signature is used to sign an entry, the electronic signature is secure;
3. The patient record contains sufficient information to:
   a. Identify the patient on each page of the patient record,
   b. Support the diagnosis,
   c. Justify the therapeutic intervention,
   d. Document results of the therapeutic intervention,
   e. Indicate advice or cautionary warnings provided to the patient, and
   f. Enable another physical therapist to assume the patient's care at any point in the course of therapeutic intervention;
4. If an individual other than a physical therapist or physical therapist assistant makes an entry into the patient record, the supervising physical therapist co-signs the entry;
5. If it is determined that erroneous information is entered into the patient record:
   a. The error is corrected in a manner that allows the erroneous information to remain legible,
   b. The individual making the correction dates and initials the correct information; and
6. For each date of service there is an accurate record of the physical therapy services provided and billed.

B. Initial evaluation. As required by A.R.S. § 32-2043(F)(1), a physical therapist shall perform the initial evaluation of a patient. The physical therapist who performs an initial evaluation shall make an entry that meets the standards in subsection (A) in the patient record and document:
1. The patient's reason for seeking physical therapy services;
2. The patient's medical history;
3. The patient's relevant medical diagnoses or conditions;
4. The patient's signs and symptoms;
5. Objective data from tests or measurements;
6. The physical therapist's interpretation of the results of the examination;
7. Clinical rationale for therapeutic intervention;

8. A plan of care that includes the proposed therapeutic intervention, measurable goals, and frequency and duration of therapeutic intervention; and
9. The patient's prognosis.

C. Therapeutic-intervention notes. Each time a therapeutic intervention is provided to a patient, the individual who provides the therapeutic intervention shall make an entry that meets the standards in subsection (A) in the patient record and document:
1. The patient's subjective report;
2. The therapeutic intervention provided or appropriately supervised;
3. The patient's response to the therapeutic intervention;
4. Objective data from tests or measures, if collected;
5. Instructions provided to the patient, if any; and
6. Any change in the plan of care required under subsection (B)(8).

D. Re-evaluation. As required by A.R.S. § 32-2043(F)(2), a physical therapist shall perform a re-evaluation when a patient fails to progress as expected, progresses sufficiently to advance the plan of care, or in accordance with R4-24-202(F)(4). A physical therapist who performs a re-evaluation shall make an entry that meets the standards in subsection (A) in the patient record and document:
1. The patient's subjective report;
2. The patient's response to the therapeutic intervention;
3. Assessment of the patient's progress;
4. The patient's current functional status;
5. Objective data from tests or measures, if collected;
6. Rationale for continuing therapeutic intervention; and
7. Any change in the plan of care required under subsection (B)(8).

E. Discharge summary. As required by A.R.S. § 32-2043(F)(3), a physical therapist shall document the conclusion of care in a patient's record regardless of the reason that care is concluded.
1. If care is provided in an acute-care hospital, the entry made under subsection (C) on the last date that a therapeutic intervention is provided constitutes documentation of the conclusion of care if the entry is made by a physical therapist.
2. If care is not provided in an acute-care hospital or if a physical therapist does not make the entry under subsection (C) on the last date that a therapeutic intervention is provided, a physical therapist shall make an entry that meets the standards in subsection (A) in the patient record and document:
   a. The date on which therapeutic intervention terminated,
   b. The reason that therapeutic intervention terminated,
   c. Inclusive dates for the episode of care terminated,
   d. The total number of days on which therapeutic intervention was provided during the episode of care,
   e. The patient's current functional status,
   f. The patient's progress toward achieving the goals in the plan of care required under subsection (B)(8), and
   g. The recommended discharge plan.

~~R4-24-304.~~ R4-24-305. Complaints and Investigations

A. A complainant shall ensure that a complaint filed with the Board is about:
1. An individual licensed or certified under this Chapter, or
2. An individual believed to be engaged in unlawful practice as described in A.R.S. § 32-2048.

B. If the Board determines there is reason to believe that an individual may have violated A.R.S. Title 32, Chapter 19, or this Chapter, the Board shall prepare a complaint and serve the complaint as described in subsection (D)(2).

~~**A.**~~**C.** Complaint requirements. A ~~complaint~~ complainant shall:
1. Submit the complaint to the Board ~~shall be made~~ in writing, and ~~transmitted to the Board by personal delivery, mail, or facsimile on a form provided by the Board. A complainant shall provide~~
2. Provide the following information:
   ~~1.~~a. Name of licensee, ~~or certificate-holder~~ certificate holder, or other individual who is the subject of complaint;
   ~~2.~~b. Name and address of ~~person filing complaint~~ complainant;
   ~~3.~~c. Nature of the complaint;
   ~~4.~~d. Details of the complaint with pertinent dates and activities;
   ~~5.~~e. Whether the complainant has contacted any other organization regarding the complaint; and
   ~~6.~~f. Whether complainant has contacted the licensee, ~~or certificate-holder~~ certificate holder, or other individual concerning the complaint, and ~~the licensee's or certificate-holder's~~ if so, the response, if any~~;~~. ~~and~~
7. ~~Whether the complainant is willing to testify at a hearing.~~

~~**B.** The Board shall notify a licensee or certificate-holder, in writing, within 90 days after receiving a complaint. The licensee or certificate-holder shall submit a written response, including records or documentation as requested by the Board, within~~

~~20 days from the date that notice of the complaint is mailed or delivered to the licensee or certificate-holder.~~

D. Within 90 days after receiving a complaint, the Board shall ensure that the complaint is reviewed to determine whether the complaint is within the Board's jurisdiction, and:
1. If the complaint is not within the Board's jurisdiction, dismiss the complaint and provide written notice of the dismissal to the complainant; or
2. If the complaint is within the Board's jurisdiction, serve a copy of the complaint on the individual complained against and provide the individual complained against with 30 days to respond and admit, deny, or further explain each allegation in the complaint.

E. The Board shall ensure that an investigation regarding the matters alleged in a complaint is conducted.

F. After expiration of the 30 days provided under subsection (D)(2), the Board shall review the complaint and investigation results and take action as prescribed under A.R.S. § 32-2045(B) or 32-2046.

~~R4-24-305.~~ R4-24-306. ~~Informal Interviews~~ Hearings

A. ~~The Board shall, when investigating~~ To facilitate investigation of a complaint, the Board may conduct an informal hearing. The Board shall send written notice of an informal ~~interview~~ hearing to ~~a licensee or certificate-holder~~ an individual who is the subject of the complaint, by personal service or certified mail, return receipt requested, at least ~~20~~ 30 days before the informal ~~interview~~ hearing.

B. The Board shall ensure that the written notice ~~shall contain~~ of informal hearing contains the following information:
1. The time, date, and place of the ~~interview~~ informal hearing;
2. An explanation of the informal nature of the proceedings;
3. The ~~licensee's or certificate-holder's~~ individual's right to appear with or without legal counsel;
4. A statement of the allegations and issues involved with a citation to relevant statutes and rules;
5. The ~~licensee's or certificate-holder's~~ individual's right to a formal hearing under A.R.S. Title 41, Chapter 6, Article 10 instead of the informal ~~interview~~ hearing; ~~and~~
6. The licensee's or certificate holder's right to request under A.R.S. § 32-3206(A) a copy of information the Board will use in making its determination; and

~~6.~~7. Notice that the Board may take disciplinary action as a result ~~of the deliberations~~ of the informal ~~interview~~ hearing if it finds the individual violated A.R.S. Title 32, Chapter 19, or this Chapter;

C. ~~An~~ The Board shall ensure that an informal ~~interview shall proceed~~ hearing proceeds as follows:
1. Introduction of the ~~licensee or certificate-holder~~ individual complained against and, if applicable, legal counsel for the ~~licensee or certificate-holder~~ individual;
2. Introduction of the Board members, staff, and Assistant Attorney General present;
3. Swearing in of the ~~licensee or certificate-holder~~ individual complained against and witnesses;
4. Brief summary of the allegations and purpose of the informal ~~interview~~ hearing;
5. Optional opening comment by ~~licensee or certificate-holder~~ the individual complained against;
6. Questioning of the ~~licensee or certificate-holder~~ individual complained against and witnesses;
7. Optional additional comments by ~~licensee or certificate-holder~~ the individual complained against; and
8. Deliberation and deciding the case by the Board.

~~R4-24-306.~~ R4-24-307. ~~Issuance of~~ Subpoenas

A. ~~All subpoenas issued in connection with Board disciplinary proceedings pursuant to Title 32, Chapter 19, Arizona Revised Statutes, shall be approved and issued by the Board or the executive director of the Board.~~ A party desiring issuance of a subpoena to compel the appearance of a witness or the production of documents or other evidence at a hearing shall file a written request with the Board that includes the following information:
1. The caption and docket number of the matter;
2. A list or description of any documents or other evidence sought;
3. The name and business address of the custodian of the documents or other evidence sought;
4. The name and business or residential address of all persons to be subpoenaed;
5. A brief statement of the reason the evidence is relevant to the matter;
6. The date, time, and place to appear or produce documents or other evidence; and
7. The name, address, and telephone number of the party, or the party's attorney, requesting the subpoena.

B. ~~A~~ The party requesting a subpoena ~~to~~ be issued shall ~~serve the subpoena as provided~~ ensure that the subpoena is served in the manner prescribed by the Arizona Rules of Civil Procedure and pay all costs involved in serving the subpoena.

C. A party or the person served with a subpoena who objects to the subpoena, in whole or in part, may file a written objection with the Board within five days after service of the subpoena or at the beginning of the hearing if the subpoena is served fewer than five days before the hearing.

D. The Board shall quash or modify a subpoena if:
1. It is unreasonable or oppressive,
2. It requests information that is confidential or privileged, or

3. The desired testimony or evidence can be obtained by an alternative method.

~~R4-24-307.~~ R4-24-308. Rehearing or Review of Board Decisions

A. The Board shall provide for a rehearing and review of its decisions under A.R.S. Title 41, Chapter 6, Article 10.

~~A.~~B. Except as provided in subsection ~~(G)~~ (J), a party ~~to a contested case who is aggrieved by the Board's decision in the case may file with the Board a written motion for rehearing or review. The motion shall be filed within 15 days after service of the decision and shall particularly state the grounds for the motion. For purposes of this subsection, a decision is served when personally delivered or sent by certified mail to the party's last known residential or business address~~ is required to file a motion for rehearing or review of a decision of the Board to exhaust the party's administrative remedies.

~~B.~~C. A party may amend a motion for rehearing or review ~~may be amended~~ at any time before ~~it is ruled upon by~~ the Board rules on the motion. ~~A response may be filed to a motion or amended motion by any other party, within 10 days of service of the motion or amended motion. The Board may require the filing of written briefs upon the issues raised in the motion and may provide for oral argument.~~

~~C.~~D. ~~A~~ The Board may grant a rehearing or review ~~of a decision may be granted~~ for any of the following ~~causes~~ reasons materially affecting ~~the moving~~ a party's rights:

1. Irregularity in the ~~administrative~~ proceedings of the Board ~~or the prevailing party,~~ or any order or abuse of discretion that deprived the moving party of a fair hearing;
2. Misconduct of the Board, its staff, or ~~the prevailing party~~ an administrative law judge;
3. Accident or surprise ~~which~~ that could not have been prevented by ordinary prudence;
4. Newly discovered material evidence that could not, with reasonable diligence, have been discovered and produced at the ~~original~~ hearing;
5. Excessive or insufficient ~~penalties or disciplinary action~~ penalty;
6. Error in the admission or rejection of evidence or other errors of law ~~in~~ occurring at the ~~original~~ hearing or during the progress of the proceedings; ~~or~~ and
7. ~~A~~ The findings of fact or decision ~~that~~ is not justified by the evidence or is contrary to law.

~~D.~~E. The Board may affirm or modify a decision or grant a rehearing or review to any or all of the parties~~. The rehearing or review may cover~~ on all or part of the issues for any of the reasons ~~stated~~ listed in subsection ~~(C)~~ (D). An order modifying a decision or granting a rehearing or review shall specify with particularly ~~state~~ the grounds for the order. ~~granting the~~ If a rehearing or review is granted, ~~and~~ the rehearing or review shall cover only the ~~grounds stated~~ matters specified in the order.

~~E.~~F. No later than ~~15~~ 30 days after making a decision and after giving the parties notice and an opportunity to be heard, the Board may order a rehearing or review on its own initiative for any of the reasons ~~stated~~ listed in subsection ~~(C)~~ (D). ~~After giving notice to the parties or the parties' counsel, the~~ The Board may grant a motion for rehearing or review, timely served, ~~on grounds~~ for a reason not stated in the motion. ~~In either case, the~~ An order granting a rehearing or review shall ~~specifically state~~ specify with particularity the grounds ~~for~~ on which the rehearing or review is granted.

~~F.~~G. When a motion for rehearing or review is based upon affidavits, the affidavits shall be served with the motion. An opposing party may, within 15 days after service, serve opposing affidavits ~~within 10 days of service of the original affidavits~~. This ~~10-day~~ period may be extended for not more than 20 days by the Board for good cause ~~shown~~ as described in subsection (I) or by written stipulation of the parties. The Board may permit reply affidavits.

H. If a rehearing is granted, the Board shall hold the rehearing within 60 days after the issue date on the order granting the rehearing.

I. The Board may extend all time limits in this Section upon a showing of good cause. A party demonstrates good cause by showing that the grounds for the party's motion or other action could not have been known in time, using reasonable diligence, and a ruling on the motion will:

1. Further administrative convenience, expedition, or economy; or
2. Avoid undue prejudice to any party.

~~G.~~J. If the Board makes a specific finding that immediate effectiveness of a particular decision is necessary for ~~the~~ preservation of the public health, safety, or welfare and that rehearing or review is impracticable, unnecessary, or contrary to public interest, the decision ~~shall~~ may be issued as a final decision without an opportunity for rehearing or review. If an application for judicial review of the ~~a~~ decision is ~~issued as final, the time limits for judicial review of the Board's final decisions, at~~ made, it shall be made under A.R.S. § 12-901 et seq.~~, apply.~~

~~R4-24-308.~~ R4-24-309. Disciplinary Actions~~; Penalties~~

A. ~~All~~ As required by A.R.S. § 39-121.01, a record of Board disciplinary actions, including a decree of censure, ~~shall remain a part of a licensee's or certificate-holder's~~ is a public record open to public inspection.

B. ~~The~~ If the Board decides to restrict a license or certificate, the Board shall ~~include~~ ensure that the restriction and any required corrective action ~~specific to~~ address the ~~grounds upon which~~ conduct that led to the ~~disciplinary action is based when restricting a license or certificate~~ restriction and protect the public. ~~Supervision~~ If the Board decides to require that an individual with ~~of~~ a restricted ~~licensee~~ license or ~~certificate holder shall~~ certificate be supervised during the period of

restriction, the Board or the Board's designee shall ensure that ~~by~~ an unrestricted licensee ~~approved by the Board~~ provides the supervision.

C. A physical therapist or physical therapist assistant ~~who's~~ whose license or certificate is suspended, revoked, or voluntarily surrendered shall return the license or certificate to the Board within 10 days ~~of~~ after receipt of ~~a final Board~~ the Board's final order.

D. ~~Following~~ At the end of a period of ~~restricted~~ license or certificate restriction, the Board shall terminate the restriction only if ~~a~~ the licensee or ~~certificate-holder shall appear before the Board and submit~~ certificate holder submits to the Board evidence of having completed all ~~Board requirements and stipulations before termination of the restriction~~ required corrective actions and complied with all terms of the restriction. If the Board believes it will help the Board determine whether to terminate a restriction, the licensee or certificate holder shall appear before the Board.

~~**E.** Following revocation of a license or certificate in any jurisdiction, an individual may not reapply for a license or certificate for two years.~~

~~**F.**~~**E.** An applicant ~~whose~~ who had a previous license or certificate ~~was previously~~ revoked by the Board shall appear before the Board ~~before a license is granted~~ before the Board acts on the application.

~~R4-24-309.~~ R4-24-310. ~~Expired~~ Substance Abuse Recovery Program

~~In addition to the requirements of A.R.S. § 32-2050, to participate in a Board-approved substance abuse recovery program, a licensee or certificate-holder shall submit to the Board:~~

~~1. Evidence that the program is licensed by the Arizona Department of Health Services to provide substance abuse recovery services;~~
~~2. If ordered by the Board or its designee, results of body fluid examinations at any time;~~
~~3. An agreement, signed by an authorized representative of the program and the licensee or certificate-holder, that the program shall provide to the Board:~~
~~a. Periodic reports regarding treatment program activity;~~
~~b. All treatment records when requested by the Board;~~
~~c. Periodic reports regarding the licensee's or certificate-holder's diagnosis, prognosis, and the recommendations for continuing care, treatment, and supervision; and~~
~~d. An immediate report if the licensee or certificate-holder refuses to submit to treatment, is in noncompliance with the established program, or if the licensee's or certificate-holder's impairment is not substantially alleviated through treatment.~~

A. Under A.R.S. § 32-2044(8), practicing as a physical therapist or working as a physical therapist assistant while mentally or physically impaired is grounds for disciplinary action.

B. The Board shall allow an impaired licensee or certificate holder to enter into a substance abuse recovery program rather than conduct a disciplinary proceeding if:

1. The impaired licensee or certificate holder is qualified under A.R.S. § 32-2050(2),
2. The Board approves the proposed program because the Board believes the proposed program will assist the impaired licensee or certificate holder to recover, and
3. The impaired licensee or certificate holder enters into the written agreement required under A.R.S. § 32-2050(3) and (4).

R4-24-311. Display of License; ~~Posting Notice;~~ Disclosure

A. A licensee or certificate holder shall display a copy or provide documentation of the ~~licensee's~~ license or certificate and current renewal ~~certificate~~ verification ~~in a location accessible to public view at the licensee's place of practice~~ as specified in A.R.S. § 32-2051(G).

B. ~~A~~ Upon request, a licensee or certificate holder shall ~~post notice at the licensee's place of practice in a location accessible to~~ inform a member of the public ~~view the name,~~ how to file a complaint by providing the address~~,~~ and telephone number of the Board office~~,~~ and a statement ~~informing the public~~ that a complaint against a licensee or certificate holder should ~~can~~ be directed to the Board.

C. Before conducting an evaluation or initiating physical therapy, a licensee shall ~~Written disclosure~~ disclose to a patient ~~shall be provided prior to evaluation and initiation of physical therapy~~ when a referring practitioner is deriving direct or indirect compensation from the referral. The licensee shall ensure that the ~~written~~ disclosure is in writing and ~~shall state that~~ states "Under A.R.S. § 32-2051(C), I am required by law to inform you in writing that your referring physician [or specify if different ~~than~~ from a physician] derives either direct or indirect compensation related to your physical therapy."

R4-24-312. Mandatory Reporting Requirement

A. As required by A.R.S. § 32-3208, an applicant, licensee, or certificate holder who is charged with a misdemeanor involving conduct that may affect patient safety or a felony shall provide written notice of the charge to the Board within 10 days after the charge is filed.

B. An applicant, licensee, or certificate holder may request a list of reportable misdemeanors from the Board.

NOTICE OF PROPOSED RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 11. DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY STANDARDS

[R08-66]

PREAMBLE

1. Sections Affected	**Rulemaking Action**
R18-11-101	Amend
R18-11-102	Amend
R18-11-107	Amend
R18-11-107.01	New Section
R18-11-108	Amend
R18-11-108.01	New Section
R18-11-108.02	New Section
R18-11-108.03	New Section
R18-11-109	Amend
R18-11-110	Amend
R18-11-111	Amend
R18-11-112	Amend
R18-11-113	Amend
R18-11-114	Amend
R18-11-115	New Section
R18-11-116	Amend
R18-11-117	Amend
R18-11-118	Amend
R18-11-121	Amend
R18-11-122	Amend
R18-11-123	Amend
Appendix A	Amend
Table 1	Repeal
Table 1	New Table
Table 2	Repeal
Table 2	New Table
Table 3	Repeal
Table 3	New Table
Table 4	Repeal
Table 4	New Table
Table 5	Repeal
Table 5	New Table
Table 6	Renumber
Table 6	New Table
Table 7	Amend
Table 8	Amend
Table 9	Renumber
Table 9	Amend
Table 10	Renumber
Table 10	Amend
Table 11	Renumber
Table 11	Amend
Table 12	Renumber
Table 12	Amend
Table 13	Renumber
Table 13	Amend
Table 14	Renumber
Table 14	Amend
Table 15	Renumber
Table 15	Amend
Table 16	Amend

Table 17	Amend
Table 18	Repeal
Table 18	Renumber
Table 18	Amend
Table 19	Renumber
Table 19	New Table
Table 20	Amend
Table 21	Renumber
Table 21	Amend
Table 22	Renumber
Table 22	Amend
Table 23	Renumber
Table 23	Amend
Table 24	Renumber
Table 24	Amend
Table 25	Renumber
Table 25	Amend
Table 26	Renumber
Table 26	Amend
Appendix B	Amend
Appendix C	New Appendix

2. The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statutes: A.R.S. §§ 49-202(A), 49-203(A)(1), 49-221, 49-222

Implementing statutes: A.R.S. §§ 49-221, 49-222

3. A list of all previous notices appearing in the *Register* addressing the proposed rule:

Notice of Rulemaking Docket Opening: 10 A.A.R. 4780, November 26, 2004

Notice of Rulemaking Docket Opening: 11 A.A.R. 5222, December 9, 2005

Notice of Rulemaking Docket Opening: 14 A.A.R. 897, March 28, 2008

4. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Shirley J. Conard

Address: Department of Environmental Quality
1110 W. Washington St., 5415A-1
Phoenix, AZ 85007

Telephone: (602) 771-4632 (Metro-Phoenix area) or
1-800-234-5677, 4632 (other areas)

Fax: (602) 771-4528

E-mail: conard.shirley@azdeq.gov

5. An explanation of the rule, including the agency's reasons for initiating the rule:

GENERAL EXPLANATION OF THIS RULEMAKING

Section 303(c) of the Clean Water Act requires all states to, where appropriate, adopt and revise water quality standards at least once every three years. States must preserve and protect the quality of navigable waters and adopt surface water quality standards by considering the following factors:

1. The protection of the public health and the environment;
2. The uses that have been made, are being made, or with reasonable probability may be made of the waters;
3. The provisions and requirements of the Clean Water Act, the Safe Drinking Water Act, and their implementing regulations;
4. The degree to which standards for one category of water could cause violations of standards for other hydrologically-connected water categories (for example, the Department must consider the degree to which surface water quality standards could cause violations of aquifer water quality standards);
5. Guidelines, action levels, or numeric criteria adopted or recommended by the U.S. Environmental Protection Agency (EPA) or any other federal agency; and
6. Any unique, physical, biological, or chemical properties of the waters.

A.R.S. § 49-222 authorizes the Department to adopt surface water quality standards that assure water quality, if attainable, that provides for protecting the public health and welfare; to develop standards to enhance the quality of water in Arizona; and to take into consideration the use and value of water for public water supplies, the propagation of fish and wildlife, and recreational, agricultural, industrial, and other purposes.

The Department is charged with adopting numeric surface water standards that establish numeric limits on the concentrations of each of the 126 toxic pollutants listed by U.S. Environmental Protection Agency under § 307 of the Clean Water Act. In adopting numeric water quality standards, the Department may consider:

1. The effect of local water quality characteristics on the toxicity of pollutants;
2. The varying sensitivities of local affected aquatic populations to these pollutants; and
3. The extent to which the natural flow of the stream is perennial, intermittent, effluent-dependent, or ephemeral.

While the Department may consider these site-specific factors in establishing water quality standards for ephemeral waters and effluent dependent waters, any water quality standard adopted must be consistent with the requirements of the Clean Water Act.

Section 303(c) of the Clean Water Act provides the basis in federal law for Arizona's surface water quality standards program. The key elements are:

1. A water quality standard is defined as consisting of the designated beneficial uses of a water body and water quality criteria necessary to support the designated uses;
2. The following minimum beneficial uses must be considered when establishing surface water quality standards under the Clean Water Act: 1) public water supply; 2) the propagation of fish, shellfish, and wildlife; 3) recreation; 4) agricultural uses; 5) industrial uses; and 6) navigation;
3. Arizona's water quality standards must protect public health and welfare, enhance the quality of water, and serve the purposes of the Clean Water Act;
4. The surface water quality standards rules must be reviewed at least once every three years using a process that includes public participation; and
5. A process exists for EPA review of the surface water quality standards adopted by the Department.

EPA requires that the Department specify appropriate uses to be achieved and protected in Arizona's surface waters. These designated uses include domestic water source (DWS), fish consumption (FC), full body contact recreation (FBC), partial body contact recreation (PBC), aquatic and wildlife (cold water) (A&Wc), aquatic and wildlife (warm water) (A&Ww), aquatic and wildlife (effluent dependent water) (A&Wedw), aquatic and wildlife (ephemeral water) (A&We), agricultural irrigation (AgI), and agricultural livestock watering (AgL). Individual surface waters in Arizona and their respective designated uses are listed in Appendix B of this rulemaking.

The surface water quality standards for downstream surface waters must be considered when establishing designated uses for upstream waters. The Department must ensure that the water quality standards that are adopted for upstream water bodies also provide for the attainment and maintenance of the water quality standards for downstream waters. This concept is stated in R18-11-104(F).

The Department must adopt water quality criteria that are sufficient to protect water quality for the designated uses of Arizona's surface waters. Water quality criteria, numeric criteria, and narrative criteria, must be based on a sound scientific rationale and must contain sufficient parameters or constituents to protect each designated use.

The Department has discretionary authority under 40 CFR 131.13 to include general policies that affect the application and implementation of the surface water quality standards in the rules. The Department has used this authority to adopt a mixing zone rule at R18-11-114, a variance rule at R18-11-122, and site specific standards in R18-11-115.

How Surface Water Quality Standards Impact Pollution Control in Arizona

Surface water quality standards are essential elements of several important water quality management programs including: Arizona Pollutant Discharge Elimination System (AZPDES) permitting; the § 305(b) water quality assessment and § 303(d) impaired water listing; and total maximum daily load (TMDL) programs.

AZPDES Permit Program

Surface water quality standards are used to regulate point source discharges of pollutants under the AZPDES permit program authorized under § 402 of the Clean Water Act. When technology-based permit limits required by the Clean Water Act are not sufficiently stringent to meet the applicable water quality standards, the Clean Water Act requires the development of more stringent, water quality-based effluent limits (WQBELs) in the AZPDES permit that are designed to ensure that the applicable surface water quality standards are met. The surface water quality standards rules play a critical role in the development of every AZPDES permit and provide the regulatory basis for the development of WQBELs which affect the levels of wastewater treatment that a discharger must provide to control the discharge of pollutants to surface waters in Arizona.

Section 305(b) Water Quality Assessment and § 303(d) Impaired Water Listing

Section 305(b) of the Clean Water Act establishes a process to develop and report information on the quality of Arizona's surface waters. The Department developed a program to monitor surface waters within its boundaries, and a biennial report describing the status of water quality in Arizona rivers, streams, lakes, and reservoirs was prepared and submitted to the U.S. Environmental Protection Agency. The § 305(b) water quality assessment process is the primary means by which the Department evaluates whether water bodies in Arizona are meeting surface water quality standards, that progress has been made in maintaining and restoring surface water quality, and the extent of remaining water quality problems. The surface water quality standards play a central role in the § 305(b) water quality assessment process by providing the benchmarks used to assess water quality status. The surface water quality standards also provide the basis for the identification of water quality-limited or impaired waters in Arizona. Under § 303(d) of the Clean Water Act, the Department identifies and lists impaired waters that do not meet one or more of the surface water quality standards. The Clean Water Act requires the Department to develop total maximum daily load analyses (TMDLs) to restore water quality in those impaired waters.

Total Maximum Daily Load (TMDL) Program

Under § 303(d) of the Clean Water Act, the Department is required to develop TMDL analyses for impaired water bodies that do not meet one or more surface water quality standards. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet surface water quality standards. The TMDL allocates that amount among the point and non-point sources in the watershed that discharge the pollutant of concern. A TMDL analysis starts with the identification of the pollutant(s) of concern and the surface water quality standards that must be attained to protect designated uses. A TMDL establishes a pollutant "budget" which is implemented through other Department water quality management programs such as the AZPDES permit program and the § 319 Non-Point Source Program. The ultimate goal of a TMDL is the restoration of water quality so that an impaired water attains applicable surface water quality standards.

Other Department Water Quality Management Programs That Depend on Surface Water Quality Standards

Section 319 of the Clean Water Act requires the Department to identify surface waters in Arizona that, without additional controls to control non-point sources of pollution cannot be reasonably expected to attain or maintain applicable water quality standards or the goals and requirements of the Clean Water Act. Management measures and best management practices (BMPs) are the primary mechanisms in § 319 of the Act to enable achievement of surface water quality standards. The Department administers the Water Quality Improvement Grant program that provides financial assistance to projects that control the discharge of pollutants to surface waters from non-point sources with a goal of achieving applicable water quality standards.

Under § 401 of the Clean Water Act, the Department may grant, condition, or deny water quality certification for a federally permitted or licensed activity that may result in a discharge to a surface water in Arizona. Congress intended that states use the § 401 water quality certification process to ensure that no federal license or permit is issued that would violate state-adopted water quality standards. The surface water quality standards that are the subject of this rulemaking are the basis for the § 401 water quality certification process. If the Department grants water quality certification for a federal license or permit, it is in effect saying that the regulated activity will not result in a violation of a surface water quality standard. The Department also may place conditions on § 401 certification to ensure compliance with the surface water quality standards. The Department may deny certification if an applicant for a federal permit or license has not demonstrated that the regulated activity will be protective of applicable water quality standards. If the Department denies water quality certification, the federal permitting or licensing agency is prohibited from issuing the permit or license. The Department conducts § 401 water quality certifications for a variety of federal programs including the § 404 dredge-and-fill permit program administered by the U.S. Army Corps of Engineers, permits for construction of new or expanded airport facilities regulated by the Federal Aviation Administration, and some power plants regulated by the Federal Energy Regulatory Commission (e.g., hydroelectric power plants).

Public Participation

An important element of the surface water quality standards review process is the involvement of those who may be affected by water quality standards decisions. Section 303(c) of the Clean Water Act requires that the Department hold at least one public hearing during the triennial review process to consider changes to the standards. A.R.S. § 49-208 requires that the Department ensure adequate public participation in the development of new or revised surface water quality standards.

The Department invites the active involvement of citizens with an interest in surface water quality issues, the regulated community who may be affected by the state's water quality standards decisions, and federal, state, and local agencies and governments, including Indian tribes, who may have a stake in the outcome of the triennial review process. The Department has, over the last two years, gone well beyond the minimum requirements for public participation in this triennial review, holding numerous workshops and public meetings to discuss water quality standards issues.

EPA Review of Arizona's Surface Water Quality Standards

The Department is required to submit new and revised water quality standards to the Region 9 Administrator of the U.S. Environmental Protection Agency (EPA) for review. The Department must submit final surface water quality standards rules to the Regional Administrator within 30 days of the date of the filing of the final rules with the Office of the Secretary of State. At that time, EPA Region 9 will review the rules to determine whether they are consistent with the requirements of the Clean Water Act and EPA's Water Quality Standards Regulation at 40 CFR 131.

The EPA review of the surface water quality standards rules consists of the following determinations:

1. Whether the designated uses are consistent with the requirements of the Clean Water Act;
2. Whether Arizona's surface water quality standards that do not include designated uses specified in § 101(a)(2) of the Clean Water Act are based upon appropriate technical and scientific data and analyses;
3. Whether the water quality criterion adequately maintains and protects water quality for the designated uses;
4. Whether the legal procedures were followed for adopting the surface water quality standards rules; and
5. Whether the surface water quality standards rules meet EPA minimum requirements specified in 40 CFR 131.6.

After completing the review, the EPA Regional Administrator may approve (in whole or in part), disapprove (in whole or in part), or conditionally approve (in whole or in part) Arizona's surface water quality standards. If the Regional Administrator makes the decision to approve (in whole or in part) the rulemaking, the decision must be made within 60 days of the date of receiving a complete submittal of the surface water quality standards rules and supporting documentation.

If the Regional Administrator determines that the surface water quality standards rules are inconsistent with the requirements of the Clean Water Act or federal water quality standards regulations, the Regional Administrator must disapprove the rules (in whole or in part) within 90 days of receiving the complete submittal of the surface water quality standards rules.

If the Regional Administrator disapproves a water quality standard, EPA must notify the Department in a letter that includes a statement of the reasons for the disapproval and specify the revisions that must be adopted to obtain full EPA approval of the surface water quality standards. Under § 303(c)(4) of the Clean Water Act, EPA may federally promulgate water quality standards if the Regional Administrator disapproves a water quality standard and the Department does not adopt the necessary revisions as specified by EPA. A state-adopted standard that EPA disapproves remains in effect until either: 1) The Department adopts the necessary revisions through the rulemaking process, or 2) EPA promulgates a federal water quality standard to supersede the disapproved water quality standard.

SECTION BY SECTION EXPLANATION OF THE RULES

R18-11-101. Definitions

This rulemaking makes minor, conforming, and editorial changes to the following definitions: "acute toxicity," "annual mean," "aquatic and wildlife (cold water)," "aquatic and wildlife (warm water)," "full-body contact," "domestic water source," "ephemeral water," "existing use," "fish consumption," "intermittent water," "mixing zone," "ninetieth percentile," "oil," "perennial water," "pollutant," "practical quantitation limit," and "surface water."

The rulemaking combines all abbreviated terms (acronyms) with their defined counterparts.

The following are new terms used within the rulemaking and have been added to this Section: "Arizona Pollutant Discharge Elimination System (AZPDES)," "assimilative capacity," "critical flow condition," "reference condition," "regulated discharge," "riffle habitat," "run-habitat," "significant degradation," and "wadeable stream."

The current definition of "fish consumption" broadly defines this designated use as the harvesting of aquatic organisms for consumption, including fish, clams, turtles, crayfish, and frogs. The revised definition limits the designated use to the use of a surface water for fishing and the human consumption of the fish that are caught.

The rulemaking adds the five lake categories, "deep lake," "igneous lake," "sedimentary lake," "shallow lake," and "urban lake," identified in the narrative nutrient standard implementation procedures rule at R18-11-108.03.

The term "outstanding Arizona water (OAW)," replaces the term "unique waters."

The rulemaking revises the term "effluent-dependent water" to clarify that effluent-dependent water is surface water that consists of point source discharges of wastewater to ephemeral water. The current definition states that effluent-dependent water consists of "discharges of treated wastewater." "Wastewater" is a broader term than "treated wastewater." For example, the "point source discharge of wastewater" would include the point source discharge of untreated cooling water from a power plant to ephemeral water. The revision clarifies that "point source discharge of wastewater" does not mean a point source discharge of stormwater.

The terms "National Pollutant Discharge Elimination System," "recreational uses," and "unique water" are no longer used in this rulemaking and have been deleted from this Article.

R18-11-102. Applicability

This Section has been reorganized and editorially revised for clarity.

Two new provisions to subsection (B) have been added to clarify the scope of the surface water quality standards rules:

Subsection (B)(3) makes clear that surface water quality standards do not apply to man-made cooling ponds if they are created outside of what would otherwise be considered a "surface water" or a "water of the United States."

Subsection (B)(4) makes clear that the surface water quality standards rules do not apply to surface waters located on Indian lands as Arizona does not have jurisdiction in Indian Country.

R18-11-107. Antidegradation

Federal water quality standards regulations require the Department to adopt a statewide antidegradation policy and identify the methods for implementing the policy. Both federal and state antidegradation policies establish a three-tiered framework of antidegradation protection to maintain and protect existing water quality. This framework is established in this rulemaking.

The basic purpose of the Tier 1 antidegradation policy is to maintain and protect existing water quality in Arizona's surface waters and to ensure that applicable surface water quality standards are attained.

Tier 2 maintains and protects existing water quality in Arizona's "high quality" surface waters by allowing the degradation of existing water quality in high quality surface water only under certain circumstances. This rule language is modeled on the federal Tier 2 regulation that applies to "high quality" surface waters with water quality that exceeds levels necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water.

Tier 3 maintains and protects existing water quality in outstanding Arizona Waters (OAWs). Currently, there are 20 OAWs that have been classified in rule. Two new OAWs have been added in this rulemaking.

Editorial changes have been made to this Section for clarity.

R18-11-107.01 Antidegradation Implementation Procedures

Federal water quality standards regulations require the Department to adopt a statewide antidegradation policy and to identify the methods for implementing the policy. Arizona's first statewide antidegradation policy at R18-11-107 was adopted in 1985. While Arizona has had a statewide antidegradation policy in rule for more than 20 years, the Department has not identified methods for implementing the policy in rule. R18-11-107.01 is a new Section that satisfies the federal mandate to identify methods for implementing antidegradation. R18-11-107.01 is supported by a detailed guidance document entitled, "Antidegradation Implementation Procedures," Arizona Department of Environmental Quality (July 2007).

This Section contains the antidegradation implementation procedures for each of the three tiers, general permits, antidegradation reviews of § 404 dredge-and-fill permits, and AZPDES stormwater permits.

The antidegradation implementation procedures rule applies to *regulated discharges*. "Regulated discharge" is a defined term at R18-11-101(35).

Arizona's antidegradation implementation procedures, like other water quality standards rules, are subject to EPA review and approval. The EPA review of the antidegradation implementation procedures is limited to ensuring that procedures are included that describe how the Department will implements the required elements of an antidegradation review. EPA may disapprove and federally promulgate all or part of the antidegradation implementation procedures if, in EPA's judgment, the implementation procedures can be applied in a way that circumvents the intent and purpose of Arizona's antidegradation policy at R18-11-107.

R18-11-108. Narrative Water Quality Standards

Narrative water quality standards are qualitative statements of desired water quality. The narrative water quality standards supplement the numeric water quality standards for specific pollutants and provide an important regulatory tool to maintain and protect the aesthetic qualities of Arizona's surface waters.

This Section establishes narrative water quality standards. This rulemaking adds a new narrative standard in subsection (D), which is a tool to prevent dumping in Arizona surface waters by making it an enforceable water quality standard, and a new narrative standard in subsection (E), which implements the third prong of the primary goal of the Clean Water Act, to restore and maintain the chemical, physical, and *biological* integrity of the nation's waters.

R18-11-108.01 Biological Criteria Implementation Procedures

This Section implements the new biocriterion in R18-11-108(E) by providing the objective criteria for determining if the narrative biocriterion standard is being met. In the past, the Department has implemented a chemically-based water quality standards program that has focused almost exclusively on the maintenance and protection of the chemical integrity of Arizona's surface waters. However, a chemically-based water quality standards program alone cannot identify or adequately address all water quality problems that may result in impairment of the biological integrity of

the state's surface waters. Biocriteria can detect water quality problems that a chemically-based water quality standards program may miss or underestimate. Biocriteria are valuable tools because they directly measure the biological condition of surface waters.

The biocriteria are based on the idea that the structure and function of aquatic biological communities provide important information about the overall quality of Arizona's surface waters and attainment of aquatic life designated uses. Existing biological communities in relatively pristine or minimally impacted surface waters in Arizona that have been subjected to little or no anthropogenic disturbance provide the best available examples of biological integrity. Measurements of the attributes, structure and function of the biological communities in minimally impacted surface waters provide the basis for establishing reference conditions that can be used to evaluate the biological condition of surface waters that have been subjected to relatively greater amounts of disturbance.

R18-11-108.02 Narrative Bottom Deposits Standards and Implementation Procedures

This new Section implements R18-11-108(A)(1), which requires that surface waters "be free from pollutants in amounts or combinations that… settle to form bottom deposits that inhibit or prohibit the habitation, growth, or propagation of aquatic life." This narrative standard, commonly referred to as the "narrative bottom deposits standard," is intended to prevent excessive sedimentation and siltation in amounts that adversely affect aquatic life. Clean stream bottom substrates are essential for the health of many fish and benthic macroinvertebrate communities. Habitat degradation occurs when key stream habitat components such as spawning gravels and cobble surfaces are covered by fine sediment, decreasing inter-gravel oxygen transfer, and reducing or eliminating the quality and quantity of pool and interstitial habitat for fish, benthic macroinvertebrates, and algae. Excessive sediment and siltation adversely alters these habitats, suffocates fish eggs, and disrupts both aquatic communities and the food web dynamics.

This Section prescribes the objective criteria that will be used to determine whether there is a violation of the narrative bottom deposits standard. Using separate criteria for warm and cold water streams, the Department will use the percentage of fine sediments in the riffle and run habitats of wadeable, perennial streams to determine compliance with the narrative bottom deposits standard. The percent fine sediment thresholds are based on a Department review of the scientific literature on sedimentation and siltation of streams.

R18-11-108.03. Narrative Nutrients Standards and Implementation Procedures

R18-11-108(A)(6) states that surface waters shall not contain pollutants in amounts or concentrations that cause the growth of algae or aquatic plants that inhibit or prohibit the habitation, growth, or propagation of other aquatic life or that impair recreational uses. R18-11-108(A)(6) is often called the "narrative nutrients standard" because it is intended to regulate nutrients that cause excessive growth of algae and plants in surface waters (e.g., total nitrogen and total phosphorus). This narrative nutrient standard is intended to address water quality problems associated with nutrient over-enrichment and accelerated rates of eutrophication of Arizona's lakes and reservoirs. Most of Arizona's lakes and reservoirs serve as termini for the rivers and streams within the watershed. With the adoption of this narrative nutrient standard and matrix for lakes and reservoirs, the Department will initiate an effort to develop narrative nutrient targets for the rivers and streams that will be protective of the designated uses of the river or stream and protective of the downstream lake or reservoir based on the matrix.

R18-11-109. Numeric Water Quality Standards

This Section prescribes numeric water quality standards for bacteria, pH, temperature, suspended sediment concentration, dissolved oxygen, and nutrients.

The single sample maximum nitrate criterion of 10 mg/L that applies to the San Pedro River from Curtiss to Benson prescribed in R18-11-109(F)(10) has been repealed. The site-specific criterion of 10 mg/L is the same as the National Primary Drinking Water Maximum Contaminant Level for nitrate promulgated by EPA under the Safe Drinking Water Act. It is also the numeric criterion that the Department adopts to maintain and protect water quality for the domestic water source (DWS) designated use. The designated uses for the San Pedro River from Curtiss to Benson do not include a DWS designated use. Since DWS is not an existing or designated use of this reach of the San Pedro River, there is no reason to retain a numeric criterion intended to maintain and protect water quality for that use. The most stringent numeric water quality standard for nitrate that currently applies to this reach of the San Pedro River is the full body contact recreation (FBC) criterion. The numeric FBC criterion for nitrate is 2,240 mg/L, over 200 times the site-specific criterion of 10 mg/L. Department research on the origin of current site-specific criterion of 10 mg/L shows that the source of the current standard appears to be a report prepared in September, 1985 by the Arizona Department of Environmental Health Services (ADHS), "San Pedro and Santa Cruz Rivers: Nutrient Standards Review." In this report, ADHS recommended that a single sample maximum nitrate standard of 10 mg/L be adopted for the San Pedro River because incidental ingestion of nitrate-enriched water during water-based recreation and consumption of alluvial groundwater further downstream could present a public health risk. The current FBC criterion of 2,240 mg/L in the surface water quality standards rules will adequately protect public health from incidental ingestion of water associated with full body contact recreation.

R18-11-110. Salinity Standards for the Colorado River

This Section contains the salinity standards for the Colorado River. The rulemaking updates the incorporation by reference in this Section.

R18-11-111. Analytical Methods

This Section contains the analytical methods that are necessary to determine compliance with a water quality standard. Minor editorial changes have been made to this Section and statutory citations have been updated and added to allow the use of EPA-approved methods for analysis of water and wastewater.

R18-11-112. Outstanding Arizona Waters

This Section establishes the criteria for classifying a water as an outstanding Arizona water. The phrase "outstanding Arizona water" parallels EPA's term and more adequately describes the type of surface water intended to be protected under the Tier 3 antidegradation policy.

The reference to "unique waters" has been replaced throughout this rulemaking with "outstanding Arizona water" to make the rule consistent with the terminology used in the federal antidegradation rule at 40 CFR 131.12 when referring to Tier 3 waters. 40 CFR 131.12 refers to "outstanding national resource waters" in the Tier 3 federal antidegradation policy and provides the highest level of antidegradation protection to them.

Davidson Canyon has been added to the list of OAWs. Davidson Canyon was nominated by the Pima County Regional Flood Control District and the Pima Association of Governments (PAG) Watershed Planning Department. Davidson Canyon contains perennial and intermittent reaches, is in a free-flowing condition, and the water quality data provided by PAG indicates that water quality is good. Davidson Canyon possesses attributes that make it of exceptional recreational and ecological significance. Davidson Canyon is one of the largest drainages in the Cienega Corridor and to Cienega Creek, which is already classified as an OAW. Davidson Canyon provides one of the most important wildlife migration corridors in Southern Arizona, linking the Santa Rita Mountains to the Rincon Mountains. The stream provides important riparian habitat for a diverse flora and fauna, including priority vulnerable species listed under the Sonoran Desert Conservation Plan and threatened and endangered species or species of concern identified by the U.S. Fish & Wildlife Service, including the lowland leopard frog and the long fin dace. The Department notes that the nominated reach of Davidson Canyon, associated water rights, and surrounding lands are being acquired by Pima County as part of the Sonoran Desert Conservation Plan. The OAW classification of Davidson Canyon is consistent with and provides support for Pima County's conservation management goals and policies for this important riparian area.

Fossil Creek, a tributary of the Verde River, has been added to the list of OAWs. Fossil Creek was nominated for OAW classification by the Grand Canyon Chapter of the Sierra Club and others. Fossil Creek is perennial, in a free-flowing condition, and the available water quality data indicates the creek has excellent water quality. Also, Fossil Creek is of exceptional ecological significance, providing habitat for a diversity of plant and animal life. Of particular importance is the fact that Fossil Creek provides habitat for a diverse assemblage of native fishes, including the Sonora sucker, desert sucker, headwater chub, round tail chub, speckled dace, and long fin dace. The restoration and long-term protection of native fish in Fossil Creek provides an exceptional opportunity to restore Arizona's declining native fish species and may increase the success of native fish restoration efforts in the Verde River watershed. The decision to classify Fossil Creek as an OAW is based largely on the information and data provide on current physical and biological conditions of Fossil Creek, which was provided in "Fossil Creek: State of the Watershed Report," Northern Arizona University (July 2005). This rulemaking delays the effective date for the Fossil Creek OAW classification until June 30, 2010 to allow the Arizona Public Service company to complete de-commissioning activities in the Fossil Creek watershed. This date is the final deadline approved by the Federal Energy Regulatory Commission to complete all decommissioning activities.

R18-11-113. Effluent-Dependent Waters

This Section establishes the effluent-dependent water standards. Effluent dependent waters (EDWs) are a special category of surface waters created by the point source discharge of wastewater to an ephemeral water. An EDW is a surface water that, without a point source discharge of wastewater, would be an ephemeral water.

Any person may request that a surface water be classified as an EDW. There are three basic information requirements that must be met to support an EDW classification by rules. First, a person must submit a map and a description of the EDW. Second, the person must submit information demonstrating that the EDW consists of a point source discharge of wastewater. Finally, a person must submit information demonstrating that the receiving water is an ephemeral water. The Department may also propose surface waters for EDW classification on its own initiative.

The 36 EDWs currently listed in subsection (D) have been moved to Appendix B.

A subcategory of the aquatic and wildlife designated use has been developed for effluent dependent waters (A&Wedw) and apply to all surface waters that are classified as EDWs by rule.

The phrase "discharge of treated wastewater" has been changed to "point source discharge of wastewater." This change allows the Director to classify ephemeral waters that receive point source discharges of untreated cooling water and other industrial process waters as effluent dependent waters in addition to discharges of municipal and domestic wastewater.

New Subsection (D): This new subsection is subsection (E) in the current rule and requires that the permit-issuing authority use the water quality standards that apply to effluent dependent waters to derive discharge limitations for a

point source discharge from a wastewater treatment plant to an ephemeral water "that changes that ephemeral water into an effluent dependent water." This phrase has been deleted to clarify that EDW standards shall be used to derive discharge limitations for *all* point source discharges of wastewater to an ephemeral water. A point source discharge of wastewater to an ephemeral water changes the receiving ephemeral water into an effluent dependent water. This position is based on the definitions of "effluent dependent water" and "ephemeral water."

The reference to "a point source discharge has been changed from a wastewater treatment plant" to "a point source discharge of wastewater" in this subsection. This change broadens the applicability of the rule to include point source discharges of wastewater from industrial facilities (for example, the discharge of wastewater from a power plant to an ephemeral water).

New language has been added to this subsection to provide regulatory flexibility to apply only acute A&W(edw) standards to point source discharges of wastewater to ephemeral waters under certain circumstances. The Department recognizes that there may be infrequent, sporadic, or emergency point source discharges of wastewater to ephemeral waters where it is reasonable to conclude that chronic A&W(edw) standards are unnecessary. Acute and chronic A&W(edw) standards would be appropriate for continuous point source discharges of wastewater to an ephemeral water that create perennial EDWs or for intermittent point source discharges of wastewater that flow seasonally or regularly. Acute and chronic A&W(edw) standards are also appropriate to regulate a point source discharge to an ephemeral water where the water may reach a downstream surface water with chronic A&W standards. Also, chronic A&W(edw) standards are appropriate where the point source discharge of effluent creates an impoundment or semi-permanent ponds to permanent ponds within an ephemeral water. However, there may be point source discharges to ephemeral waters where the amount of flow, the frequency, or the duration of the discharge is such that it is unlikely that water may be present in the receiving ephemeral water for a sufficient period of time for organisms in the receiving water to be chronically exposed to pollutants.

This Section has been revised to provide flexibility so that acute A&Wedw standards can be applied on a case-by-case basis in AZPDES permits. Language has been added that provides regulatory flexibility by clarifying that AZPDES permit writers may establish alternative discharge limits derived from acute A&W(edw) or chronic A&W(edw) standards based on seasonal variations in the discharge.

R18-11-114. Mixing Zones

This Section lists the criteria for establishing a mixing zone and contains minor editorial and formatting changes.

A provision has been added to subsection (H) that prohibits zones of initial dilution in a mixing zone that are so large that they cause lethality to drifting organisms that pass through.

R18-11-115. Site-Specific Standards

State and federal law authorize the adoption of site-specific standards that reflect local environmental conditions. The federal water quality standards at 40 CFR 131.11(b)(1)(ii) provides the Department with the authority to adopt water quality criteria that are "modified to reflect site-specific conditions." Similarly, A.R.S. § 49-221(C)(6) directs the Director to consider "[a]ny unique physical, biological, or chemical properties of the waters" when establishing surface water quality standards. Under A.R.S. § 49-222(C), the Department may consider the effect of local water quality characteristics on the toxicity of specific pollutants and the varying sensitivities of local, affected aquatic populations to pollutants when setting numeric water quality standards. This Section provides specific authority for site-specific standards and identifies methods acceptable to the Department and EPA for their development. Site specific standards, like all surface water quality standards, must be based on a sound scientific rationale to protect the aquatic and wildlife designated use. This Section prescribes technically defensible methods for site-specific standard development.

R18-11-116. Resource Management Agencies

This Section establishes how resource management agencies are affected by this Article and contains minor editorial changes.

R18-11-117. Canals and Municipal Park Lakes

This Section establishes standards for canals and municipal park lakes and contains minor editorial changes.

R18-11-118. Dams and Flood Control Structures

This Section establishes standards for dams and flood control structures and contains minor editorial changes.

R18-11-121. Schedules of Compliance

This Section establishes schedules of compliance and contains minor editorial changes.

R18-11-122. Variances

This Section establishes water quality standard variances for a point source discharge and contains minor editorial changes.

R18-11-123. Discharge Prohibitions

This Section adds four new discharge prohibitions that prevent point source discharges of wastewater to ephemeral waters that may flow onto the Ak Chin Indian Reservation. The four prohibitions are for discharges to Vekol Wash, Smith Wash, Santa Rosa Wash, and Santa Cruz Wash.

Appendix A. Numeric Water Quality Criteria

Appendix A lists the numeric water quality standards. Tables 1 and 2 have been deleted and the information contained in those tables has been combined into new Table 1.

The numeric water quality criteria has been revised to reflect changes in criteria derivation methodologies, revised exposure assumptions, new information, and data on human health effects or new toxicity data that support a revision of aquatic life criteria. Specific revisions and the reasons for making the changes are indicated in the subsequent tables. Each table is organized by designated use and existing and criteria for each parameter are indicated.

Methodologies for Deriving Criteria for the Domestic Water Source Designated Use

Numeric criteria to maintain and protect water quality for the Domestic Water Source (DWS) designated use are either Maximum Contaminant Levels (MCLs) established by EPA under the National Primary Drinking Water Regulations or values derived using EPA methods to protect human health. Where an MCL has been established for a pollutant, the Department adopted the MCL as a criterion to protect water quality for the DWS designated use. Where MCLs were not available, the Department derived criteria for the DWS designated use using the following equations:

For carcinogens:

$$\frac{70\ \text{kg} * 10^{-6}}{\text{OCSF} * 2\ \text{L/day}}$$

For non-carcinogens:

$$\frac{\text{Rfd} * \text{RSC} * 70\ \text{kg}}{2\ \text{L/day}}$$

In the carcinogen equation, 70 kg is the average weight of a human male in kilograms; 10^{-6} is the excess cancer risk level; OCSF is the oral cancer slope factor and 2 L/day is the national average water consumption rate in liters per day.

In the non-carcinogen equation, Rfd is the reference dose; RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms and 2 L/day is the national average water consumption rate in liters per day. The relative source contribution factor is a way to account for other exposures pathways to a pollutant (e.g., food, inhalation work exposure, etc.). There is little reliable information to assess the amount of exposure to a pollutant attributable to different exposure pathways. EPA uses a default RSC factor of 20 percent when developing MCLs. This assumes that 20 percent of a person's exposure to a pollutant is estimated to be through the ingestion of water. The Department used the same default RSC factor in deriving criteria for the DWS designated use.

Numeric criteria for the DWS designated use has been adopted using the following decision criteria:

1. MCLs, where available;
2. Where MCLs were not available, the DWS criterion was calculated using the appropriate procedure for carcinogens or non-carcinogens;
3. For carcinogens where an OCSF was not available, but an Rfd is available, the non-carcinogen procedure and the Rfd was used to calculate a criterion;
4. For non-carcinogens, a criterion using available Rfds was used. If an Rfd was not available in the Integrated Risk Information System (IRIS) but a surrogate Rfd was available, such as a Minimum Risk Level from the Agency for Toxic Substances Disease Registry (ATSDR), a criterion using the MRL as an Rfd was calculated;
5. Where an MCL, OCSF, Rfd or MRL was not available, a criterion for the DWS designated use was not derived.

The following table summarizes the revisions to the numeric criteria for the DWS designated use. The table lists only those pollutants where a change or repeal has been made in this rulemaking.

Numeric Water Quality Standards for Domestic Water Source

Pollutant	Existing DWS Criterion (µg/L)	Proposed DWS Criterion (µg/L)	Reason for Change
Acenaphthylene	NNS	None	No change. This pollutant has been removed from Appendix A because of a lack of numeric criteria for any designated use.

Acrylonitrile	0.07	0.06	The standard was calculated using the DWS method for carcinogens (OCSF = 5.40E-01).
Arsenic	50 T	10 T	The rulemaking adopts the new MCL for arsenic.
Benz(a)anthracene	0.048	0.005	The standard was calculated using the DWS method for carcinogens (OCSF = 7.30E+00).
3,4 Benzfluoranthene	0.048	0.005	The standard was calculated using the DWS method for carcinogens (OCSF = 7.30E+00).
Benzo(k)fluoranthene	0.048	0.005	The standard was calculated using the DWS method for carcinogens (OCSF = 7.30E+00).
Boron	630 T	1,400 T	The standard was calculated using the DWS method for non-carcinogens (Rfd = 2.00E-01).
Chlorine (total residual)	700	4,000	The maximum residual disinfection level (MRDL) for chlorine has been adopted from EPA's 1998 Final Rule for Disinfectants and Disinfection-By-Products.
Chloropyrifos	New parameter not in existing rules	21	The standard was calculated using the DWS method for non-carcinogens (Rfd = 3.00E-03).
Chromium III	10,500 T	None	The rulemaking removes the speciated form and relies on total chromium DWS criterion of 100.
Chrysene	0.479	0.005	The standard was calculated using the DWS method for carcinogens (OCSF = 7.30E+00).
Dibenz(ah)anthracene	0.048	0.005	The standard was calculated using the DWS method for carcinogens (OCSF = 7.30E+00).
p,p'-Dichlorodiphenyl dichloroethane (DDD)	0.15	0.1	DDT and its metabolites, DDD & DDE have been consolidated into a single listing. The DWS criterion for DDT (0.1 µg/L) has been adopted for DDD.
1,1-Dichloroethane	NNS	None	No change. This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
1,3-Dichloropropene	2	0.7	The standard was calculated using the DWS method for carcinogens (OCSF = 5.00E-02).
Endosulfan sulfate	NNS	42	The standard was calculated using the DWS method for non-carcinogens (Rfd = 6.00E-03).
Hexachlorobutadiene	0.45	0.4	The DWS criteria have been adopted using the first significant figure to the right of the decimal point.
Malathion	New parameter not in existing rules	140	The standard was calculated using the DWS method for non-carcinogens (Rfd = 2.00E-02).
o-Nitrophenol	NNS	None	This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
Paraquat	New parameter not in existing rules	32	The standard was calculated using the DWS method for non-carcinogens (Rfd = 4.50E-03).
Permethrin	New parameter not in existing rules	350	The standard was calculated using the DWS method for non-carcinogens (Rfd = 5.00E-02).
Phenol	4,200	2,100	The standard was calculated using the DWS method for non-carcinogens (Rfd = 3.00E-01).
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	0.01	0.00003	The new MCL has been adopted.
Trihalomethanes (total)	100	80	The new MCL has been adopted. This standard is exceeded when the sum of four compounds (bromoform, chloroform, chlorodibromethane, and dichloro bromomethane) exceeds 80 µg/L as a rolling annual average.

Uranium	35 D	30 D	The new MCL has been adopted.

Methodologies for Deriving Criteria for the Fish Consumption Designated Use

Numeric water quality criteria for the fish consumption (FC) designated use were derived using the following equations:

For carcinogens:

$$\frac{70\ \text{kg} * 10^{-6}}{\text{OCSF} * 17.5\ \text{grams/day} * \text{BCF}}$$

For non-carcinogens:

$$\frac{\text{Rfd} * \text{RSC} * 70\ \text{kg}}{17.5\ \text{grams/day} * \text{BCF}}$$

In the carcinogen equation, 70 kg is the average weight of a human male in kilograms; 10^{-6} is the excess cancer risk level; OCSF is the oral cancer slope factor, 17.5 grams /day is the national average fish consumption rate, and BCF is a bioconcentration factor.

In the non-carcinogen equation, Rfd is the reference dose, RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms, 17.5 grams/day is the national average fish consumption rate, and BCF is the bioconcentration factor.

These equations differ from those used to calculate the existing fish consumption criteria in two ways. First, the default fish consumption rate was changed from 6.5 grams/day to 17.5 grams/day. Second, the relative source contribution factor (RSC) was used to calculate numeric fish consumption criteria for non-carcinogens.

The default fish consumption rate was changed to 17.5 grams/day for several reasons. The previous rate of 6.5 grams/day was based upon the national average fish consumption value EPA used to calculate fish consumption criteria for the 1980 ambient water quality criteria documents. EPA now recommends a fish consumption rate of 17.5 grams/day to adequately protect the general population of fish consumers. The 17.5 grams/day value is based on more recent fish consumption data obtained the U.S. Department of Agriculture 1994-1996 Continuing Survey of Food Intake by Individuals (CSFII). The CSFII is considered to be one of the best sources of current and unbiased information on the consumption of fish by the United States population. There is no reliable and statistically valid local or regional data on fish consumption to support the derivation of alternative fish consumption criteria for Arizona. Third, EPA uses the 17.5 grams/day value when making its national criteria recommendations to protect human health.

The second major difference between the methods used to calculate the existing and criteria is the use of a relative source contribution factor. A default RSC factor of 20 percent was used when calculating numeric fish consumption criteria. This means that the Department assumes that 20 percent of a person's exposure to a pollutant may come from the fish consumption exposure pathway. Previously, the Department had assumed that 100 percent of a person's exposure to a pollutant came through fish consumption. EPA recommends using the 20 percent relative source contribution factor when routes of exposure to a pollutant other than fish consumption are anticipated, but adequate data to quantify those exposures are lacking. In a few instances, EPA has data suggesting a higher RSC for a particular pollutant. In those instances, the actual RSL was used rather than the default 20 percent (e.g., antimony, cadmium). The use of a higher fish consumption rate of 17.5 grams/day and an RSC factor resulted in more stringent numeric criteria for the fish consumption designated use.

The rulemaking adopts numeric criteria for the fish consumption designated use using the following decision criteria:

1. For carcinogens where an OCSF was available, a criterion was calculated using the procedure for carcinogens;
2. For carcinogens where an OCSF was not available but an Rfd was available, the non-carcinogen procedure was used and a criterion was calculated for the carcinogen using the Rfd or an Rfd surrogate;
3. For non-carcinogens, a criterion was calculated using available Rfd. If an Rfd was not available in the Integrated Risk Information System (IRIS) but a surrogate Rfd was available, such as a Minimum Risk Level (MRL) from the Agency for Toxic Substances Disease Registry (ATSDR), a criterion was calculated for the non-carcinogen using the MRL;
4. Where an OCSF, Rfd or MRL was not available, a criterion was not derived for the fish consumption designated use. If the Department did not have a bioconcentration factor for a pollutant, a FC criterion was not calculated.

Methylmercury Fish Tissue Criterion

This rulemaking adopts a fish tissue criterion for methylmercury of 0.3 mg methylmercury/kg fish tissue to protect human health. This criterion is based on EPA's recommended national criterion for methylmercury in fish tissue, "Water Quality Criterion for the Protection of Human Health: Methylmercury," EPA-823-R-01-001 (January 2001). The criterion is expressed as a maximum concentration of methylmercury in fish and shellfish *tissue* to protect the consumers of fish and shellfish in the general population. It is not a water column value.

To assess health risks, EPA derived a reference dose (Rfd) for methylmercury. A reference dose is an estimate (with uncertainty of perhaps an order of magnitude) of a daily exposure to the human population (including sensitive sub groups) that is likely to be without an appreciable risk of adverse health effects during a lifetime. To derive the Rfd, EPA established a no observed adverse effect level (NOAEL) for developmental neurotoxicity and then divided the NOAEL by a numerical uncertainty factor of 10 to account for areas of variability and uncertainty in the risk estimate.

The consumption of contaminated fish and shellfish is the primary route of human exposure to methylmercury.

Methylmercury is highly toxic to humans and causes a number of adverse health effects. Health studies have demonstrated that methylmercury is a potent neurotoxin, particularly in developing organisms. The brain is the most sensitive organ for which suitable health effects data are available to quantify a dose-response relationship.

Mercury is found in the environment as a result of natural and human activities. During its movement among the atmosphere, land, and water, mercury undergoes a series of chemical transformations. One of these transformations is to an organic form of mercury called methylmercury. Methylmercury is easily absorbed into the living tissue of aquatic organisms and is not easily eliminated. Consequently, methylmercury accumulates in the tissues of predators as they age. The Department concluded that it is more appropriate to adopt a fish tissue criterion for methylmercury instead of a water column-based water quality standard. A fish tissue criterion for methylmercury is more directly tied to the Clean Water Act goal of protecting public health because it is based directly on the primary route of human exposure to methylmercury (i.e., fish consumption). Second, the concentration of methylmercury in fish tissue is easier to quantify and is less variable over time. Third, a fish tissue criterion is consistent with how fish consumption advisories are issued. Fish consumption advisories for mercury are based on the amount of methylmercury in fish tissue that is considered acceptable. The adoption of a fish tissue standard directly supports Department issuance of fish consumption advisories.

The following table presents the existing and the criteria for the FC designated use. The table identifies the pollutant, the current FC criterion, the FC criterion, and the reasons for any changes. The table lists only those pollutants where a change or repeal has been made in this rulemaking.

Numeric Water Quality Standards for Fish Consumption

Pollutant	Existing FC Criterion (µg/L)	Proposed FC Criterion (µg/L)	Reason for Change
Acenapthene	2,670	198	The standard was calculated using FC method for non-carcinogens (Rfd = 6.00E-02); revised FC rate of 17.5 g/day; default Relative Source Contribution Factor (RSC) = 20 percent. Bioconcentration Factor (BCF = 242).
Acenaphthylene	NNS	None	This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
Acrolein	25	1.9	The standard was calculated using FC method for non-carcinogens (Rfd = 5.00E-04); revised FC rate of 17.5 g/day; default RSC = 20%; BCF = 215.
Acrylonitrile	0.7	0.2	The standard was calculated using FC method for carcinogens (OCSF = 5.40E-01); revised FC rate of 17.5 g/day; and BCF = 30.
Aldrin	0.0001	0.00005	The standard was calculated using FC method for carcinogens (OCSF = 1.70E+01); revised FC rate of 17.5 g/day; and BCF = 4,670.
Anthracene	1,000	74	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00E-01); revised FC rate of 17.5 g/day; and default RSC = 20%; BCF = 3,230.8.
Antimony	4,300 T	640 T	The standard was calculated using FC method for non-carcinogens (Rfd = 4.00E-04); revised FC rate of 17.5 g/day; RSC = 40%; BCF = 1.
Arsenic	1,450 T	80 T	The standard was calculated using FC method for carcinogens (OCSF = 1.50E+00); revised FC rate of 17.5 g/day; and BCF = 3.

Benz(a)anthracene	0.49	0.02	The standard was calculated using FC method for carcinogens (OCSF = 7.30E+00); revised FC rate of 17.5 g/day; and BCF = 30.
Benzene	140	114	The standard was calculated using FC method for carcinogens (OCSF = 3.50E-02); revised FC rate of 17.5 g/day; and BCF = 1.
3,4 Benzfluroanthene	0.49	0.02	The standard was calculated using FC method for carcinogens (OCSF = 7.30E+00); revised FC rate of 17.5 g/day; and BCF = 30.
Benzidine	0.001	0.0002	The standard was calculated using FC method for carcinogens (OCSF = 2.30E+02); revised FC rate of 17.5 g/day; and BCF = 87.5.
Benzo(a)pyrene	0.05	0.02	The standard was calculated using FC method for carcinogens (OCSF = 7.30E+00); revised FC rate of 17.5 g/day; and BCF = 30.
Benzo(ghi)perylene	NNS	None	This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
Benzo(k)fluoranthene	0.49	0.02	The standard was calculated using FC method for carcinogens (OCSF = 7.30E+00); revised FC rate of 17.5 g/day; and BCF = 30.
Beryllium	1,130 T	84 T	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 19.
Bis (2-chloroethoxy methane)	NNS	None	This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
Bis (2-chloroethyl) ether	1.4	0.5	The standard was calculated using FC method for carcinogens (OCSF = 1.10E+00); revised FC rate of 17.5 g/day; and Bioconcentration factor BCF = 6.9.
Bis (2-chloroisopropyl) ether	174,400	3,441	The standard was calculated using FC method for non-carcinogens (Rfd = 4.00 E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 9.3.
Bromodichloromethane	46	17	The standard was calculated using FC method for carcinogens (OCSF = 6.20E-02); revised FC rate of 17.5 g/day; and BCF = 3.8.
Bromoform	360	133	The standard was calculated using FC method for carcinogens (OCSF = 7.90E-03); revised FC rate of 17.5 g/day; and BCF = 3.8.
Bromomethane	4,020	299	The standard was calculated using FC method for non-carcinogens (Rfd = 1.40E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 3.8.
Butyl benzyl phthalate	5,200	386	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 414.
Cadmium	84 T	6 T	The standard was calculated using FC method for non-carcinogens (Rfd = 5.00E-04); revised FC rate of 17.5 g/day; RSC = 25%; and BCF = 64.
Carbon tetrachloride	4	2	The standard was calculated using FC method for carcinogens (OCSF = 1.30E-01); revised FC rate of 17.5 g/day; and BCF = 18.8.
Chlordane	0.002	0.0008	The standard was calculated using FC method for carcinogens (OCSF = 3.50E-01); revised FC rate of 17.5 g/day; and BCF = 14,100.

Chlorobenzene	20,900	1,553	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 10.3.
Chloroform	470	2,133	The standard was calculated using FC method for non-carcinogens (Rfd = 0.01); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 3.8.
2-Chloronapthalene	4,300	317	The standard was calculated using FC method for non-carcinogens (Rfd = 8.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 202.
2-Chlorophenol	400	30	The standard was calculated using FC method for non-carcinogens (Rfd = 5.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 134.
Chromium III	1,010,000 T	75,000 T	The standard was calculated using FC method for non-carcinogens (Rfd = 1.50E+00); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 16.
Chromium VI	2,000 T	150 T	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 16.
Chrysene	4.92	0.02	The standard was calculated using FC method for carcinogens (OCSF = 7.30E+00); revised FC rate of 17.5 g/day; and BCF = 30.
Cyanide (as free cyanide)	215,000 T	16,000 T	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 1.
Dalapon	161,500	8,000	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00 E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 3.
Dibenz(ah)anthracene	0.20	0.02	The standard was calculated using FC method for carcinogens (OCSF = 7.30E+00); revised FC rate of 17.5 g/day; and BCF = 30.
Dibromochloromethane	34	13	The standard was calculated using FC method for carcinogens (OCSF = 8.40E-02); revised FC rate of 17.5 g/day; and BCF = 3.80.
Dibutyl phthalate	12,100	899	The standard was calculated using FC method for non-carcinogens (Rfd = 1.00E-01); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 89.
1,2-Dichlorobenzene	2,800	205	The standard was calculated using FC method for non-carcinogens (Rfd = 9.00E-02); revised FC rate of 17.5 g/day; RSC = 20%: and BCF = 351.
1,4-Dichlorobenzene	77,500	5,755	The standard was calculated using FC method for non-carcinogens (Rfd = 0.4); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 55.6.
3,3'-Dichlorobenzidine	0.08	0.03	The standard was calculated using FC method for carcinogens (OCSF = 4.50E-01); revised FC rate of 17.5 g/day; and BCF = 312.
P,p'-Dichlorodiphenyl dichloroethane (DDD)	0.001	0.0002	The standard was calculated using FC method for carcinogens (OCSF = 3.40E-01; revised FC rate of 17.5 g/day; and BCF = 53,600.
P,p'-Dichlorodiphenyl dichloroethylene (DDE)	0.001	0.0002	The standard was calculated using FC method for carcinogens (OCSF = 3.40E-01); revised FC rate of 17.5 g/day; and BCF = 53,600.
P,p'-Dichlorodiphenyl trichloroethane (DDT)	0.0006	0.0002	The standard was calculated using FC method for carcinogens (OCSF = 3.40E-01); revised FC rate of 17.5 g/day; and BCF = 53,600.

1,1-Dichloroethane	NNS	None	This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
1,2-Dichloroethane	100	37	The standard was calculated using FC method for carcinogens (OCSF = 9.10E-02); revised FC rate of 17.5 g/day; and BCF = 1.2.
1,1-Dichloroethylene	320	7,143	The standard was calculated using FC method for non-carcinogens (Rfd = 5.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 5.6.
1,2-trans-Dichloroethylene	136,000	10,127	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 1.6.
Dichloromethane	1,600	593	The standard was calculated using FC method for carcinogens (OCSF = 7.50E-03); revised FC rate of 17.5 g/day; and BCF = 0.9.
2,4-Dichlorophenol	800	59	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 40.7.
1,2-Dichloropropane	236,000	17,518	The standard was calculated using FC method for non-carcinogens (Rfd = 0.09); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 4.1.
1,3-Dichloropropene	1,700	42	The standard was calculated using FC method for carcinogens (Rfd = 5.00E-02); revised FC rate of 17.5 g/day; and BCF = 1.9.
Dieldrin	0.0001	0.00005	The standard was calculated using FC method for carcinogens (OCSF = 1.60E+01); revised FC rate of 17.5 g/day; and BCF = 4,670.
Diethyl phthalate	118,000	8,767	The standard was calculated using FC method for non-carcinogens (Rfd = 8.00E-01); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 73.
Di(2-ethylhexyl)phthalate	7.4	3	The standard was calculated using FC method for carcinogens (OCSF = 1.40E-02); revised FC rate of 17.5 g/day; and BCF = 104.
2,4-Dimethylphenol	2,300	171	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 93.8.
4,6-Dinitro-o-cresol	7,800	582	The standard was calculated using FC method for non-carcinogens (Rfd = 4.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 5.5.
2,4-Dinitrophenol	14,400	1,067	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 1.5.
2,4-Dinitrotoluene	5,700	421	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 3.8.
1,2-Diphenylhydrazine	0.5	0.2	The standard was calculated using FC method for carcinogens (OCSF = 8.00E-01); revised FC rate of 17.5 g/day; and BCF = 24.9.
Endosulfan sulfate	NNS	18	The standard was calculated using FC method for non-carcinogens (Rfd = 6.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 270.
Endosulfan (total)	240	18	The standard was calculated using FC method for non-carcinogens (Rfd = 6.00E-03); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 270.

Endrin	0.8	0.06	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00E-04); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 3,970.
Ethylbenzene	28,700	2,133	The standard was calculated using FC method for non-carcinogens (Rfd = 1.00E-01); revised FC rate of 17.5 g/day; RSC = 20% and BCF = 37.5.
Ethyl chloride	NNS	None	This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
Fluoranthene	380	28	The standard was calculated using FC method for non-carcinogens (Rfd = 4.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 1,150.
Fluorene	14,400	1,067	The standard was calculated using FC method for non-carcinogens (Rfd = 4.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; BCF = 30.
Glyphosate	1,077,000	266,667	The standard was calculated using FC method for non-carcinogens (Rfd = 1.00E-01); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 0.3.
Heptachlor	0.0002	0.00008	The standard was calculated using FC method for carcinogens (OCSF = 4.50E+00); revised FC rate of 17.5 g/day; and BCF = 11,200.
Heptachlor epoxide	0.0001	0.00004	The standard was calculated using FC method for carcinogens (OCSF = 9.10E+00); revised FC rate of 17.5 g/day; and BCF = 11,200.
Hexachlorobenzene	0.001	0.0003	The standard was calculated using FC method for carcinogens (OCSF = 1.6); revised FC rate of 17.5 g/day; and BCF = 8,690.
Hexachlorobutadiene	50	18	The standard was calculated using FC method for carcinogens (OCSF = 7.80E-02); revised FC rate of 17.5 g/day; and BCF = 2.8.
Hexachlorocyclohexane alpha	0.01	0.005	The standard was calculated using FC method for carcinogens (OCSF = 6.30E+00); revised FC rate of 17.5 g/day; and BCF = 130.
Hexachlorocyclohexane gamma (lindane)	25	1.8	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00E-04); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 130.
Hexachlorocyclopentadiene	580	74	The standard was calculated using FC method for non-carcinogens (Rfd = 6.00E-04); revised FC rate of 17.5 g/day; RSC = 40%; and BCF = 130.
Hexachloroethane	9	3.3	The standard was calculated using FC method for carcinogens (OCSF = 1.40E-02); revised FC rate of 17.5 g/day; and BCF = 86.9.
Indeno (1,2,3-cd) pyrene	0.49	0.2	The standard was calculated using FC method for non-carcinogens (OCSF = 7.3E-01); revised FC rate of 17.5 g/day; and BCF = 30.
Isophorone	2,600	961	The standard was calculated using FC method for carcinogens (OCSF = 9.50E-04); revised FC rate of 17.5 g/day; and BCF = 4.4.
Mercury	0.6 T	None	The Department replaced mercury FC criterion with methylmercury fish tissue criterion.
Methylmercury	New parameter not in existing rules	Fish tissue criterion 0.3 mg/kg	Based on EPA § 304(a) national criteria recommendation for methylmercury in fish tissue.

Napthalene	20,500	1,524	The standard was calculated using FC method for non-carcinogens (Rfd =2.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 10.5.
Nickel	4,600 T	511 T	The standard was calculated using FC method for non-carcinogens (Rfd =2.00E-02); revised FC rate of 17.5 g/day; RSC = 30%; and BCF = 47.
Nitrobenzene	1,900	138	The standard was calculated using FC method for non-carcinogens (Rfd =5.00E-04); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 2.9.
o-Nitrophenol	NNS	None	This pollutant has been removed from Appendix A because of a lack of criteria for any designated use.
N-Nitrosodimethylamine	8	3	The standard was calculated using FC method for carcinogens (OCSF = 5.10E+01); revised FC rate of 17.5 g/day; and BCF = 0.026.
N-Nitrosodi-n-phenylamine	16	6	The standard was calculated using FC method for carcinogens (OCSF = 4.90E-03); revised FC rate of 17.5 g/day; and BCF = 136.
N-Nitrosodi-n-propylamine	1.4	0.5	The standard was calculated using FC method for carcinogens (OCSF = 7.00E+00); revised FC rate of 17.5 g/day; and BCF = 1.1.
Pentachlorophenol	1,000	370	The standard was calculated using FC method for carcinogens (OCSF = 1.20E-01); revised FC rate of 17.5 g/day; and BCF = 0.1.
Phenol	1,000	37	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00E-01); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 6,462.
Picloram	24,300	2,710	The standard was calculated using FC method for non-carcinogens (Rfd = 7.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 31.
Polychlorinated biphenyls (PCBs)	0.007	0.00006	The standard was calculated using FC method for carcinogens (OCSF = 2); revised FC rate of 17.5 g/day; and BCF = 31,200.
Pyrene	10,800	800	The standard was calculated using FC method for non-carcinogens (Rfd = 3.00E-02); revised FC rate of 17.5 g/day; and RSC = 20%. BCF = 30.
Selenium	9,000 T	667 T	The standard was calculated using FC method for non-carcinogens (Rfd =5.00E-03); revised FC rate of 17.5 g/day; and RSC = 20%. BCF = 6.
Silver	107,700 T	8,000 T	The standard was calculated using FC method for non-carcinogens (Rfd =5.00E-03); revised FC rate of 17.5 g/day; and RSC = 20%. BCF = 0.5.
Sulfides	NNS	None	The Department replaced “sulfides with “hydrogen sulfide.”
2,3,7,8-Tetrachlorodibenzo-p-dixoin	0.000000004	0.000000005	The standard was calculated using FC method for carcinogens (OCSF = 1.00E+07); revised FC rate of 17.5 g/day; and BCF = 5,000.
1,1,2,2-Tetrachloroethane	11	4	The standard was calculated using FC method for carcinogens (OCSF = 2.00E-01); revised FC rate of 17.5 g/day; and BCF = 5.
Tetrachloroethylene	3,500	261	The standard was calculated using FC method for non-carcinogens (Rfd =1.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 30.6.

Thallium	7.2 T	1 T	The standard was calculated using FC method for non-carcinogens (Rfd =8.00E-05); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 119.
Toluene	201,000	29,907	The standard was calculated using FC method for non-carcinogens (Rfd = 2.00E-01); revised FC rate of 17.5 g/day; RSC = 40%; and BCF = 10.7.
Toxaphene	0.001	0.0003	The standard was calculated using FC method for carcinogens (OCSF = 1.10E+00); revised FC rate of 17.5 g/day; and BCF = 13,100.
1,2,4-Trichlorobenzene	950	70	The standard was calculated using FC method for non-carcinogens (Rfd = 1.00E-02); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 114.
1,1,1 Trichloroethane	NNS	428,571	The standard was calculated using FC method for non-carcinogens (Rfd = 2.0E+00); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 5.6.
1,1,2-Trichloroethane	42	16	The standard was calculated using FC method for carcinogens (OCSF = 5.70E-02); revised FC rate of 17.5 g/day; and BCF = 4.5.
Trichloroethylene	203,200	29	The standard was calculated using FC method for carcinogens (OCSF = 1.3E-02); revised FC rate of 17.5 g/day; and BCF = 10.6.
2,4,6-Trichlorophenol	6.5	2	The standard was calculated using FC method for carcinogens (Rfd = 1.1E-02); revised FC rate of 17.5 g/day; and BCF = 150.
Vinyl Chloride	13	5	The standard was calculated using FC method for carcinogens (OCSF = 7.20E-01); revised FC rate of 17.5 g/day; and BCF = 1.2.
Zinc	69,000 T	5,106 T	The standard was calculated using FC method for non-carcinogens (Rfd = 0.3); revised FC rate of 17.5 g/day; RSC = 20%; and BCF = 47.

Methodologies for Deriving Criteria for the Full Body Contact Designated Use

The numeric water quality criteria for the full body contact (FBC) designated use was derived using the following equations:

For carcinogens:

$$\frac{70\ \text{kg} * 10^{-6}}{\text{OCSF} * 15\ \text{ml/day}}$$

For non-carcinogens:

$$\frac{\text{Rfd} * \text{RSC} * 70\ \text{kg}}{15\ \text{ml/day}}$$

In the carcinogen equation, 70 kg is the average weight of a human male in kilograms; 10^{-6} is the excess cancer risk level; OCSF is the oral cancer slope factor, and 15 ml/day is the incidental water ingestion rate in milliliters per day.

In the non-carcinogen equation, Rfd is the reference dose, RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms, and 15 ml/day is the incidental water ingestion rate in milliliters per day.

These equations differ from those used to calculate the existing full body contact criteria in two ways. First, the rulemaking changes the incidental water ingestion rate from 50 ml/day to 15 ml/day. Second, the relative source contribution factor (RSC) is used to calculate numeric full body contact criteria for non-carcinogens to account for other exposure pathways.

The incidental water ingestion rate was changed to 15 ml/day for several reasons. First, the previous rate of 50 ml/day was based upon 1989 EPA recommendations for incidental water ingestion rate associated with swimming contained in "Exposure Factors Handbook," Exposure Assessment Group, EPA/600/8-89/043. (May, 1989), U.S. Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, D.C. In 2000, EPA published a new guidance document that addresses incidental ingestion of water from recreational uses in "Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health," U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, EPA-822-B-00-004, (October 2000). While EPA does

not make national criteria recommendations for recreational uses like FBC, EPA does suggest approaches to estimating exposure to pollutants through incidental ingestion during recreation. Literature on recreational exposure combined with assumptions about the average mouthful of water ingested for every hour total body contact can be used to determine an incidental water ingestion rate. EPA now recommends an incidental ingestion rate of 10 ml/day. This estimate is based on an assumption that an individual may be in full body contact with water for 123 hours a year (representing one hour exposure per day throughout four summer months) and may ingest 30 ml of water per hour of swimming. EPA calculated the 10 ml/day value by multiplying 30 ml/hour by 123 hours per year and dividing the product by 365 days. Studies of recreational exposures suggest that there may be considerable variability in this incidental water ingestion rate. EPA notes that while the recommended value of 10 ml/day may be appropriate where full body contact recreational activities may occur daily during the summer months, states in warmer climates, like Arizona, may wish to use a higher incidental ingestion rate to protect their populations that may swim in surface waters for a greater portion of the year. The Department assumed that persons in Arizona could engage in full body contact recreational activities for more than 4 months in a year. The incidental water ingestion rate of 15 ml/day is based on the assumption that a person may engage in full body contact recreational activity for 180 hours per year (6 months) and ingest 30 ml of water per hour. The 15 ml/day value is calculated by multiplying 30 ml/hour by 180 hours per year and dividing by 365.

The second major difference between the methods used to calculate the existing and FBC criteria are the use of a relative source contribution factor. A default RSC factor of 20 percent was used when calculating numeric FBC criteria unless EPA recommended a higher RSC (e.g., antimony, barium). The Department assumes that 20 percent of a person's exposure to a pollutant may come from incidental water ingestion while engaged in water-based recreation. Previously, the Department had calculated criteria assuming that 100 percent of a person's exposure to a pollutant came through a single exposure pathway, e.g., through full body contact recreation.

This rulemaking adopts numeric criteria for the full body contact designated use using the following decision criteria:

1. A criterion was calculated using the appropriate procedure for carcinogens or non-carcinogens;
2. For carcinogens where an OCSF was not available but an Rfd was available, the non-carcinogen procedure was used and a criterion was calculated for the carcinogen using the Rfd or a surrogate Rfd;
3. For non-carcinogens, a criterion was calculated using available Rfds. If an Rfd was not available in the Integrated Risk Information System (IRIS) but a surrogate Rfd was available, such as a Minimum Risk Level (MRL) from the Agency for Toxic Substances Disease Registry (ATSDR), a criterion for the non-carcinogen was calculated using the MRL;
4. Where an OCSF, Rfd or MRL was unavailable, a criterion was not derived for the full body contact designated use.
5. Where the calculated full body contact standard was more stringent than the Domestic Water Source standard, for the same pollutant, the DWS value was used in place of the calculated PBC value. It is unlikely that n individual will be more at risk from incidental ingestion during recreational activities than through direct consumption.

Full Body Contact Criterion for Arsenic

Arsenic is categorized by the USEPA as a Class A carcinogen (i.e., a demonstrated human carcinogen based on sufficient human epidemiological evidence (as opposed to animal studies)). Increased lung cancer mortality was observed in multiple human populations exposed primarily through inhalation. Also, increased mortality from multiple internal organ cancers (liver, kidney, lung, and bladder) and an increased incidence of skin cancer were observed in populations consuming drinking water high in inorganic arsenic.

Calculation of the FBC criteria using the standard equation above would yield new FBC criteria of 3 µg/L. This concentration was more stringent than the new drinking water MCL for arsenic of 10µg/L and the arsenic criterion that was being considered to maintain and protect water quality in surface waters with the domestic water source (DWS) designated use (also 10 µg/L). The Department did not think it was reasonable to adopt a FBC criterion for arsenic that was more stringent than the new drinking water MCL or the proposed DWS criterion for arsenic, particularly when it was unlikely that persons engaged in full body contact recreational activity would be more highly exposed to arsenic through incidental ingestion of water than persons who are assumed to ingest 2 liters of drinking water each day.

In the 2000 Human Health Methodology guidance document described in paragraph five of this section, EPA provides that states may use alternate minimum risk levels in standards derivation. It states that 10^{-6} and 10^{-5} are appropriate risk levels for health protection of the general population provided more highly exposed subpopulations do not exceed the 10^{-4} risk level. EPA allows states to adopt a water quality criterion for a pollutant based on an excess cancer risk level of 10^{-5} provided that the chosen risk level is protective of the most highly exposed populations and there is adequate public participation in the decision to use a risk level other than 10^{-6}. As noted earlier, the Department made conservative assumptions when choosing the exposure parameters for deriving criteria for the FBC designated use regarding the amount of time a person may swim in an Arizona lake or stream and the estimated amount of incidental ingestion. While the Department does not have data on the actual amounts of swimming or full body contact

recreational activity that takes place in Arizona surface waters, the Department thinks it is unlikely that there is a highly exposed subpopulation in Arizona that is engaged in full body contact recreational activities in Arizona lakes and reservoirs for more than an hour a day for more than six months out of the year.

Based on EPA's guidance on excess cancer risk levels and the conservative assumptions of exposure, this rulemaking adopts the full body contact water quality criterion for arsenic based on an excess cancer risk level of 10^{-5}. The new FBC criterion for arsenic is calculated as follows:

$$\frac{70 \text{ kg} \times 10^{-5}}{1.5\text{E}+00 \times 15 \text{ ml/day}} = 31 \ \mu\text{g/L}$$ (The value has been rounded down to 30 µg/L)

It should be noted that the FBC criterion of 30 µg/L, while not as stringent as the drinking water MCL or the DWS criterion (10 µg/L), it is *more* stringent than the currently effective FBC criterion of 50µg/L in rule.

The following table presents the existing and criteria for the FBC designated use. The table identifies the pollutant, the current FBC criterion, the FBC criterion and the reasons for any changes. The use of a revised water ingestion rate and an RSC factor resulted in more stringent numeric criteria for the full body contact designated use. The table lists only those pollutants where a change or repeal has been made in this rulemaking.

Numeric Water Quality Standards for Full Body Contact

Pollutant	Existing FBC Criterion (µg/L)	Proposed FBC Criterion (µg/L)	Reason for Change
Acenapthene	84,000	56,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 6.00E-02); revised FBC water ingestion rate of 15 ml/day and Relative Source Contribution Factor (RSC) = 20%.
Acrolein	700	467	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-04); revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
Alachlor	14,000	9,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-02); revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
Anthracene	420,000	280,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-01); revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
Antimony	560 T	747 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 4.00E-04); revised FBC water ingestion rate of 15 ml/day and RSC = 40%.
Arsenic	50 T	30 T	The standard was calculated using FBC method for carcinogens (OCSF = 1.5E+00); revised FBC water ingestion rate of 15 ml/day. The Department used 10^{-5} as the Excess Cancer Risk Level (ECRL) for arsenic (See additional discussion in preamble).
Atrazine	49,000	32,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.50E-02); revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
Barium	98,000 T	163,333 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 7.00E-02); revised FBC water ingestion rate of 15 ml/day and RSC = 50%.

Benz(a)anthracene	1.9	0.2	The standard was calculated using FBC method for carcinogens (OCSF = 7.30E+00); revised FBC water ingestion rate of 15 ml/day.
Benzene	93	40	The standard was calculated using FBC method for carcinogens (OCSF = 3.50E-02); revised FBC water ingestion rate of 15 ml/day.
3,4 Benzfluroanthene	1.9	0.2	The standard was calculated using FBC method for carcinogens (OCSF = 7.30E+00); revised FBC water ingestion rate of 15 ml/day.
Benzo(ghi)perylene	NNS	None	This pollutant has been deleted from Appendix A because of a lack of criteria for any designated use.
Benzo(k)fluoranthene	1.9	0.2	The standard was calculated using FBC method for carcinogens (OCSF = 7.30E+00); revised FBC water ingestion rate of 15 ml/day.
Beryllium	2,800 T	1,867 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-03), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.
Bis(2-chloroethoxy) methane	NNS	None	This pollutant has been deleted from Appendix A because of a lack of criteria for any designated use.
Bis(2-chloroethyl) ether	1.3	1	The standard was calculated using FBC method for carcinogens (OCSF = 1.10E+00); revised FBC water ingestion rate of 15 ml/day.
Bis(2-chloroisopropyl) ether	56,000	37,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 4.00E-02); revised FBC rate of 15 ml/day; and RSC = 20%.
Boron	126,000 T	186,667 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-01), revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
Bromodichloromethane	TTHM	18,667	The standard was calculated using FBC method for carcinogens (OCSF = 6.20E-02); revised FBC water ingestion rate of 15 ml/day.
Bromoform	180	18,667	The standard was calculated using FBC method for carcinogens (OCSF = 7.90E-03); revised FBC water ingestion rate of 15 ml/day.
Bromomethane	2,000	1,307	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.40E-03), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.
Butyl benzyl phthalate	280,000	186,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-01), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.
Cadmium	700 T	467 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-04), revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
Carbofuran	7,000	4,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-03), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.

Chlorine (total residual)	140,000	4,000	The maximum residual disinfection level (MRDL) from EPA 1998 Final Rule for Disinfectants and Disinfection-By-Products has been adopted.
Chlorobenzene	28,000	18,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.
Chloroform	230	9,333	The standard was calculated using FBC method for non-carcinogens (Rfd =0.01), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.
2-Chloronapthalene	112,000	74,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 8.00E-02), revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
2-Chlorophenol	7,000	4,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-03), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.
Chloropyrifos	Not in existing rules	2,800	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-03), revised FBC water ingestion rate of 15 ml/day and RSC = 20%.
Chromium III	2,100,000 T	1,400,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.50E+00), revised FBC water ingestion rate of 15 ml/day; and RSC = 20%.
Chromium VI	4,200 T	2,800 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-03), revised FBC water ingestion rate of 15 ml/day, Relative Source Contribution Factor (RSC) = 20%.
Chromium (total)	100 T	None	No OCSF or Rfd to calculate a FBC criterion.
Chrysene	19.2	0.2	The standard was calculated using FBC method for carcinogens (OCSF = 7.30E+00); revised FBC water ingestion rate of 15 ml/day.
Cyanide (as free cyanide)	28,000 T	18,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Dalapon	42,000	28,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-02); revised FBC rate of 15 ml/day; and RSC = 20%.
Dibenz(ah)anthracene	1.9	0.2	The standard was calculated using FBC method for carcinogens (OCSF = 7.30E+00); revised FBC water ingestion rate of 15 ml/day.
Dibromochloromethane	TTHM	18,667	The standard was calculated using FBC method for carcinogens (OCSF = 8.40E-02); revised FBC water ingestion rate of 15 ml/day.
1,2-Dibromo-3-chloropropane	2,800	None	No OCSF or Rfd to calculate FBC criterion.
1,2-Dibromoethane	0.05	8,400	The standard was calculated using FBC method for non-carcinogens (Rfd = 9.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.

Dibutyl phthalate	140,000	93,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-Dichlorobenzene	126,000	84,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 9.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,4-Dichlorobenzene	560,000	373,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 0.04), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
p,p'-Dichlorodiphenyl dichloroethane (DDD)	5.8	4	The standard was calculated using FBC method for carcinogens (OCSF = 3.40E-01); revised FBC water ingestion rate of 15 ml/day.
p,p'-Dichlorodiphenyl dichloroethylene (DDE)	4.1	4	The standard was calculated using FBC method for carcinogens (OCSF = 3.40E-01); revised FBC water ingestion rate of 15 ml/day.
p,p'-Dichlorodiphenyl trichloroethane (DDT)	4.1	4	The standard was calculated using FBC method for carcinogens (OCSF = 3.40E-01); revised FBC water ingestion rate of 15 ml/day.
1,1-Dichloroethylene	230	46,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-trans-Dichloroethylene	28,000	18,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4-Dichlorophenol	4,200	2,800	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4-Dichlorophenoxyacetic acid (2,4-D)	14,000	9,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-Dichloropropane	126,000	84,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 0.09); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
1,3-Dichloropropene	420	28	The standard was calculated using FBC method for carcinogens (OCSF = 5.00E-02); revised FBC water ingestion rate of 15 ml/day.
Diethyl phthalate	1,120,000	746,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 8.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Di(2-ethylhexyl) adipate	1,200	560,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 6.00E-01); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
Di(2-ethylhexyl)phthalate	100	100	The standard was calculated using FBC method for carcinogens (OCSF = 1.40E-02); revised FBC water ingestion rate of 15 ml/day.

2,4-Dimethylphenol	28.000	18,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
4,6-Dinitro-o-cresol	5,600	3,733	The standard was calculated using FBC method for non-carcinogens (Rfd = 4.00E-03); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
2,4-Dinitrophenol	2,800	1,867	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-03), revised FBC water ingestion rate of 15 ml/day, RSC = 20%.
2,4-Dinitrotoluene	2,800	1,867	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Di-n-octyl phthalate	560,000	373,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 0.4); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
Dinoseb	1,400	933	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-03); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
Diquat	3,080	2,053	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.20E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Endosulfan sulfate	NNS	5,600	The standard was calculated using FBC method for non-carcinogens (Rfd = 6.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Endosulfan (total)	8,400	5,600	The standard was calculated using FBC method for non-carcinogens (Rfd = 6.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Endothall	28,000	18,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day, RSC = 20%.
Endrin	420	280	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-04), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Ethylbenzene	140,000	93,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Fluoranthene	56,000	37,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 4.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Fluorene	56,000	37,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 4.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.

Fluoride	84,000	140,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 6.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 50%.
Glyphosate	140,000	93,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorocyclohexane gamma (lindane)	420	280	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-04), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorocyclopentadiene	9,800	11,200	The standard was calculated using FBC method for non-carcinogens (Rfd = 6.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 40%.
Hexachloroethane	100	100	The standard was calculated using FBC method for carcinogens (OCSF = 1.40E-02); revised FBC water ingestion rate of 15 ml/day.
Isophorone	1,500	1,474	The standard was calculated using FBC method for carcinogens (OCSF = 9.50E-04); revised FBC water ingestion rate of 15 ml/day.
Malathion	Not in existing rules	18,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Manganese	196,000 T	130,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.40E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Mercury	420 T	280 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-04), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Methoxychlor	7,000	4,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Napthalene	28,000	18,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Nickel	28,000 T	28,000 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 30%.
Nitrate	2,240,000	3,733,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.60E+00), revised FBC water ingestion rate of 15 ml/day, and RSC = 50%.
Nitrite	140,000	233,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 50%.

Nitrobenzene	700	467	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-04), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Oxamyl	35,000	23,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.50E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Paraquat	Not in existing rules	4,200	The standard was calculated using FBC method for non-carcinogens (Rfd = 4.50E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Permethrin	Not in existing rules	46,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Phenol	840,000	280,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Picloram	98,000	65,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 7.00E-02); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
Polychlorinated biphenyls (PCBs)	28	19	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-05); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
Pyrene	42,000	28,000	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Selenium	7,000 T	4,667 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Silver	7,000 T	4,667 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Simazine	7,000	4,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 5.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Styrene	280,000	186,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,3,7,8-Tetrachlorodibenzo-p-dixoin	0.00009	0.00003	The standard was calculated using FBC method for carcinogens (OCSF = 1.00E+07); revised FBC water ingestion rate of 15 ml/day. Resultant value is more stringent than DWS so default to DWS.

Tetrachloroethylene	14,000	9,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Thallium	112 T	75 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 8.00E-05), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Toluene	280,000	373,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 2.00E-01), revised FBC water ingestion rate of 15 ml/day, and RSC = 40%.
Toxaphene	1.3	3	The standard was calculated using FBC method for carcinogens (OCSF = 1.10E+00); revised FBC water ingestion rate of 15 ml/day. Resultant value is more stringent than DWS so defaulted to DWS.
1,2,4-Trichlorobenzene	14,000	9,333	The standard was calculated using FBC method for non-carcinogens (Rfd = 1.00E-02), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,1,1-Trichloroethane	200	1,866,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 2); revised FBC water injection rate of 15 ml/day; and RSC = 20%.
Trichloroethylene	280,000	108	The standard was calculated using FBC method for carcinogens (OCSF = 1.30E-02); revised FBC water ingestion rate of 15 ml/day.
2,4,5-Trichlorophenoxy proprionic acid (2,4,5-TP)	11,200	7,467	The standard was calculated using FBC method for non-carcinogens (Rfd = 8.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Uranium	NNS	2,800	The standard was calculated using FBC method for non-carcinogens (Rfd = 3.00E-03), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Xylenes (total)	2,800,000	186,667	The standard was calculated using FBC method for non-carcinogens (Rfd = 0.2), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.
Zinc	420,000 T	280,000 T	The standard was calculated using FBC method for non-carcinogens (Rfd = 0.3), revised FBC water ingestion rate of 15 ml/day, and RSC = 20%.

Methodologies for Deriving Criteria for the Partial Body Contact Designated Use

The Department derived numeric water quality criteria for the partial body contact (PBC) designated use using the following equation:

$$\frac{\text{Rfd} * \text{RSC} * 70\text{ kg}}{15\text{ ml/day}}$$

In this equation, Rfd is the reference dose, RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms, and 15 ml/day is the incidental water ingestion rate in milliliters per day. The equation is the same equation used to derive numeric criteria for non-carcinogens for the full body contact designated use.

This equation is different from the methods the Department has used in previous rulemakings to calculate PBC criteria. When PBC criteria were originally proposed in 1992, the Department followed recommendations for water quality criteria for the PBC designated use developed by members of the regulated community and published in "Proposed Human Health Ambient Water Quality Standards for Arizona" (EBASCO Environmental, et. al 1990). EBASCO recommended a criteria development method for PBC that included using reference doses and average weight of the human male of 70 kg but with an incidental water ingestion rate of 0.5 liter (500 ml). In 2002, the

Department revised the EBASCO methodology because it used what the Department considered to be an unreasonable incidental water ingestion rate of 500 ml to derive the PBC criteria (a rate that was 10 times higher than the incidental water ingestion rate used to calculate the FBC criteria in 1992). In 2002, the Department used the following equation to derive PBC criteria:

$$\frac{\text{Rfd x 70 kg}}{\text{50 ml/day}}$$

This rulemaking revises the incidental water ingestion rate for both the FBC and PBC designated uses to 15 ml/day. The incidental water ingestion rate for the PBC designated use should not be higher than the rate used for the FBC designated use. In the absence of reliable data to derive PBC criteria based on dermal exposures or another incidental ingestion rate, the rulemaking relies on incidental water ingestion rate used in the FBC methodology to derive criteria for the PBC designated use.

The rulemaking adopts numeric criteria for the partial body contact designated use using the following decision criteria:

1. Calculate a criterion using the PBC equation using available Rfds. If an Rfd is not available in the Integrated Risk Information System (IRIS) but a surrogate Rfd is available, such as a Minimum Risk Level (MRL) from the Agency for Toxic Substances and Disease Registry (ATSDR), a PBC criterion is calculated using the MRL; and
2. A criterion for the partial body contact designated use was not derived if there was no Rfd or MRL.

The following table presents the existing and proposed criteria for the PBC designated use. The table identifies the pollutant, the current PBC criterion, the proposed PBC criterion and the reasons for any proposed changes. The use of a revised water ingestion rate and an RSC factor resulted in more stringent numeric criteria for the partial body contact designated use. The table lists only those pollutants where a change or repeal has been made in this rulemaking.

Numeric Water Quality Standards for Partial Body Contact

Pollutant	Existing PBC Criterion (µg/L)	Proposed PBC Criterion (µg/L)	Reason for Change
Acenapthene	84,000	56,000	The standard was calculated using PBC method (Rfd = 6.00E-02), revised PBC water ingestion rate of 15ml/day, and RSC = 20%.
Acrolein	700	467	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15ml/day, and RSC = 20%.
Acrylonitrile	56,000	37,333	The standard was calculated using PBC method (Rfd = 0.04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Alachlor	14,000	9,333	The standard was calculated using PBC method (Rfd = 1.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Aldrin	42	28	The standard was calculated using PBC method (Rfd 3.00E-05), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Anthracene	420,000	280,000	The standard was calculated using PBC method (Rfd = 3.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Antimony	560 T	747 T	The standard was calculated using PBC method (Rfd = 4.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 40%.

Arsenic	420 T	280 T	The standard was calculated using PBC method (Rfd = 3.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Atrazine	49,000	32,667	The standard was calculated using PBC method (Rfd = 3.50E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Barium	98,000 T	163,333 T	The standard was calculated using PBC method (Rfd = 0.07), revised PBC water ingestion rate of 15 ml/day, and RSC = 50%.
Benzene	93	3,733	The standard was calculated using PBC method (Rfd = 4.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Benzidine	4,200	2,800	The standard was calculated using PBC method (Rfd = 3.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Beryllium	2,800 T	1,867 T	The standard was calculated using PBC method (Rfd = 2.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Bis(2-chloroisopropyl) ether	56,000	37,333	The standard was calculated using PBC method (Rfd 4.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Boron	126,000 T	186,667	The standard was calculated using PBC method (Rfd = 2.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Bromodichloromethane	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day and RSC = 20%.
Bromoform	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Bromomethane	2,000	1,307	The standard was calculated using PBC method (Rfd = 1.40E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Butyl benzyl phthalate	280,000	186,667	The standard was calculated using PBC method (Rfd = 2.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Cadmium	700 T	467 T	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

Carbofuran	7,000	4,667	The standard was calculated using PBC method (Rfd = 5.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Carbon tetrachloride	980	1,307	The standard was calculated using PBC method (Rfd = 7.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 40%.
Chlordane	700	467	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Chlorine (total residual)	140,000	4,000	The maximum residual disinfection level (MRDL) has been adopted from EPA's 1998 Final Rule for Disinfectants and Disinfection-By-Products. Proposed concentration is the level to avoid eye and skin irritation.
Chlorobenzene	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Chloroform	14,000	9,333	The standard was calculated using PBC method (Rfd = 0.01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2-Chloronapthalene	112,000	74,667	The standard was calculated using PBC method (Rfd = 8.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2-Chlorophenol	7,000	4,667	The standard was calculated using PBC method (Rfd = 5.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Chloropyrifos	Not in existing rules	2,800	The standard was calculated using PBC method (Rfd = 3.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Chromium III	2,100,000 T	1,400,000 T	The standard was calculated using PBC method (Rfd = 1.50E+00, revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Chromium VI	4,200 T	2,800 T	The standard was calculated using PBC method (Rfd = 3.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Chromium (total)	100 T	None	No Rfd or MRL to calculate a PBC criterion.
Chrysene	19	0.2	No Rfd or MRL to calculate a PBC criteria; used FBC criteria.
Cyanide (as free cyanide)	28,000 T	18,667 T	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

Dalapon	42,000	28,000	The standard was calculated using PBC method (Rfd = 3.00E-02); revised PBC water ingestion rate of 15 ml/day and RSC = 20%.
Di Benz(ah) anthracene	1.9	0.2	No Rfd or MRL to calculate a PBC criteria; used FBC criteria.
Dibromochloromethane	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-Dibromo-3-chloropropane	2,800	None	No Rfd or MRL to calculate a PBC method or criterion.
1,2-Dibromoethane	0.005	8,400	The standard was calculated using PBC method (Rfd = 9.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Dibutyl phthalate	140,000	93,333	The standard was calculated using PBC method (Rfd = 1.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-Dichlorobenzene	126,000	84,000	The standard was calculated using PBC method (Rfd = 9.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,4-Dichlorobenzene	560,000	373,333	The standard was calculated using PBC method (Rfd = 0.4), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
p,p'-Dichlorodiphenyl dichloroethane (DDD)	5.8	467	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
p,p'-Dichlorodiphenyl dichloroethylene (DDE)	4.1	467	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
p,p'-Dichlorodiphenyl trichloroethane (DDT)	700	467	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-Dichloroethane	280,000	186,667	The standard was calculated using PBC method (MRL = 2.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,1-Dichloroethylene	12,600	46,667	The standard was calculated using PBC method (Rfd = 5.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-trans-Dichloroethylene	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

Dichloromethane	84,000	56,000	The standard was calculated using PBC method (Rfd = 6.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4-Dichlorophenol	4,200	2,800	The standard was calculated using PBC method (Rfd = 3.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4-Dichlorophenoxyacetic acid (2,4-D)	14,000	9,333	The standard was calculated using PBC method (Rfd = 1.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2-Dichloropropane	126,000	84,000	The standard was calculated using PBC method (Rfd = 0.09), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,3-Dichloropropene	420	28,000	The standard was calculated using PBC method (Rfd = 3.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Dieldrin	70	47	The standard was calculated using PBC method (Rfd = 5.00E-05), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Diethyl phthalate	1,120,000	746,667	The standard was calculated using PBC method (Rfd = 8.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Di(2-ethylhexyl) adipate	840,000	560,000	The standard was calculated using PBC method (Rfd = 6.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Di(2-ethylhexyl)phthalate	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4-Dimethylphenol	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
4,6-Dinitro-o-cresol	5,600	3,733	The standard was calculated using PBC method (Rfd = 0.004), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4-Dinitrophenol	2,800	1,867	The standard was calculated using PBC method (Rfd = 2.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4-Dinitrotoluene	2,800	1,867	The standard was calculated using PBC method (Rfd = 2.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

2,6-Dinitrotoluene	5,600	3,733	The standard was calculated using PBC method (MRL = 4.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Di-n-octyl phthalate	560,000	373,333	The standard was calculated using PBC method (Rfd = 0.4), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Dinoseb	1,400	933	The standard was calculated using PBC method (Rfd = 1.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Diquat	3,080	2,053	The standard was calculated using PBC method (Rfd = 2.20E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Endosulfan sulfate	NNS	5,600	The standard was calculated using PBC method (Rfd = 6.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Endosulfan (total)	8,400	5,600	The standard was calculated using PBC method (Rfd = 6.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Endothall	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Endrin	420	280	The standard was calculated using PBC method (Rfd = 3.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Ethylbenzene	140,000	93,333	The standard was calculated using PBC method (Rfd = 1.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Fluoranthene	56,000	37,333	The standard was calculated using PBC method (Rfd = 4.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Fluorene	56,000	37,333	The standard was calculated using PBC method (Rfd = 4.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Fluoride	84,000	140,000	The standard was calculated using PBC method (Rfd = 6.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 50%.
Glyphosate	140,000	93,333	The standard was calculated using PBC method (Rfd = 1.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

Heptachlor	700	467	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Heptachlor epoxide	18	12	The standard was calculated using PBC method (Rfd = 1.30E-05), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorobenzene	1,120	747	The standard was calculated using PBC method (Rfd = 8.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorobutadiene	280	187	The standard was calculated using PBC method (MRL = 2.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorocyclohexane alpha	11,200	7,467	The standard was calculated using PBC method (MRL = 8.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorocyclohexane beta	840	560	The standard was calculated using PBC method (MRL = 6.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorocyclohexane gamma (lindane)	420	280	The standard was calculated using PBC method (Rfd = 3.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Hexachlorocyclopentadiene	9,800	11,200	The standard was calculated using PBC method (Rfd = 6.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 40%.
Hexachloroethane	1,400	933	The standard was calculated using PBC method (Rfd = 1.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Isophorone	280,000	186,667	The standard was calculated using PBC method (Rfd = 2.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Lead	15 T	15 T	Based on Safe Drinking Water action level.
Malathion	Not in existing rules	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Manganese	196,000 T	130,667	The standard was calculated using PBC method (Rfd = 1.40E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Mercury	420 T	280 T	The standard was calculated using PBC method (Rfd = 3.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

Methoxychlor	7,000	4,667	The standard was calculated using PBC method (Rfd = 5.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Napthalene	28,000	18,667	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Nickel	28,000 T	28,000	The standard was calculated using PBC method (Rfd = 2.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 30%.
Nitrate	2,240,000	3,733,333	The standard was calculated using PBC method (Rfd = 1.60E+00), revised PBC water ingestion rate of 15 ml/day, and RSC = 50%.
Nitrite	140,000	233,333	The standard was calculated using PBC method (Rfd = 1.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 50%.
Nitrobenzene	700	467	The standard was calculated using PBC method (Rfd = 5.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
N-Nitrosodi-n-propylamine	133,000	88,667	The standard was calculated using PBC method (MRL = 9.5E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Oxamyl	35,000	23,333	The standard was calculated using PBC method (Rfd = 2.50E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Paraquat	Not in existing rules	4,200	The standard was calculated using PBC method (Rfd = 4.50E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Pentachlorophenol	42,000	28,000	The standard was calculated using PBC method (Rfd = 3.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Permethrin	Not in existing rules	46,667	The standard was calculated using PBC method (Rfd = 5.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Phenol	840,000	280,000	The standard was calculated using PBC method (Rfd = 3.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Picloram	98,000	65,333	The standard was calculated using PBC method (Rfd = 0.07), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

Polychlorinated biphenyls (PCBs)	28	19	The standard was calculated using PBC method (Rfd = 2.00E-05), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Pyrene	42,000	28,000	The standard was calculated using PBC method (Rfd = 3.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Selenium	7,000 T	4,667 T	The standard was calculated using PBC method (Rfd = 5.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Silver	7,000 T	4,667 T	The standard was calculated using PBC method (Rfd = 5.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Simazine	7,000	4,667	The standard was calculated using PBC method (Rfd = 5.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Styrene	280,000	186,667	The standard was calculated using PBC method (Rfd = 2.00E-01), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,3,7,8-Tetrachlorodibenzo-p-dixoin	1.4	0.0009	The standard was calculated using PBC method (Rfd = 1.00E-09), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,1,2,2-Tetrachloroethane	56,000	93,333	The standard was calculated using PBC method (MRL = 0.04), revised PBC water ingestion rate of 15 ml/day, and RSC = 50%.
Tetrachloroethylene	14,000	9,333	The standard was calculated using PBC method (Rfd = 1.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.)
Thallium	112 T	75 T	The standard was calculated using PBC method (Rfd = 8.00E-05), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Toluene	280,000	373,333	The standard was calculated using PBC method (Rfd = 0.2), revised PBC water ingestion rate of 15 ml/day, and RSC = 40%.
Toxaphene	1,400	933	The standard was calculated using PBC method (MRL = 1.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,2,4-Trichlorobenzene	14,000	9,330	The standard was calculated using PBC method (Rfd = 1.00E-02), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

1,1,1-Trichloroethane	200	1,866,667	The standard was calculated using PBC method (Rfd = 2), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
1,1,2-Trichloroethane	5,600	3,733	The standard was calculated using PBC method (Rfd = 2), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Trichloroethylene	280,000	280	The standard was calculated using PBC method (Rfd = 3.00E-04), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
2,4,5-Trichlorophenoxy proprionic acid (2,4,5-TP)	11,200	7,467	The standard was calculated using PBC method (Rfd = 8.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Uranium	NNS	2,800	The standard was calculated using PBC method (Rfd = 3.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Vinyl Chloride	4,200	2,800	The standard was calculated using PBC method (Rfd = 3.00E-03), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Xylenes (total)	2,800,000	186,667	The standard was calculated using PBC method (Rfd = 0.2), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.
Zinc	420,000 T	280,000 T	The standard was calculated using PBC method (Rfd = 0.3), revised PBC water ingestion rate of 15 ml/day, and RSC = 20%.

Numeric Water Quality Standards for Aquatic and Wildlife Designated Uses

Currently, there are numeric criteria for 98 pollutants to maintain and protect water quality for the aquatic life and wildlife (A&W) designated uses. This rulemaking establishes new criteria, or revisions, to existing numeric A&W criteria for 59 parameters. In most cases, the § 304(a) national criteria recommendations to protect freshwater aquatic life have been adopted. The national criteria for total residual chlorine has been adopted and will provide for slightly less restrictive criteria for both acute and chronic aquatic life criteria. The current water quality standards are: acute = 11 µg/L and chronic = 5 µg/L. The proposed values are: acute = 11 µg/L and chronic = 19 µg/L.

New numeric water quality standards for previously unregulated pollutants include new A&W criteria for chloropyrifos, guthion, hydrogen sulfide, iron, malathion, mirex, paraquat, parathion, permethrin, and tributyltin. The numeric water quality criteria for "sulfides" have been repealed and replaced with numeric criteria for hydrogen sulfide. The current A&W criteria for beryllium has been repealed because EPA has withdrawn its national § 304(a) criteria recommendations for the pollutant.

Several pollutants have been amended by rounding existing criteria to the nearest whole number or to the first significant figure to the right of a decimal point.

No changes have been made to the current numeric water quality criteria for the aquatic and wildlife (ephemeral) (A&We) designated use.

Criteria for hardness-dependent metals

The numeric water quality standards for certain metals are expressed as a function of hardness because hardness can affect the toxicities of the metals to aquatic life. These "hardness-dependent" pollutants include cadmium, chromium III, copper, lead, nickel, silver, and zinc. Increasing hardness has the effect of decreasing the toxicity of the metals.

Currently, the numeric water quality criteria for these pollutants include a lower hardness cap of 25 mg/L. This hardness cap is based on an earlier EPA national criteria recommendation that when the hardness of freshwater is less than 25 mg/L, a hardness-dependent metals criterion should be calculated as if the hardness is 25 mg/L. EPA made this

recommendation because the available toxicity data for the hardness-dependent metals in the hardness range below 25 mg/L was limited. EPA describes the available data for copper, zinc, and cadmium in the 1-25 mg/L range as "somewhat limited" and "quite limited" for silver, lead, chromium III, and nickel. EPA subsequently re-evaluated the limited available data in the current metals criteria documents and determined that the data were "inconclusive." EPA expressed concern that capping hardness at 25 mg/L without additional data or justification could result in metals criteria that provided less protection than that intended by EPA's "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses," U.S. Environmental Protection Agency, Office of Research and Development, EPA 822/R-85-100, (1985).

EPA now recommends that hardness not be capped at 25 mg/L or any other hardness value on the lower end. The rulemaking removes the lower hardness cap for the hardness-dependent pollutants to include numeric metals criteria in the 1-25 hardness range.

The following table provides the dissolved acute and dissolved chronic criteria for the hardness-dependent metals. In the rule, the Department has prepared individual tables by metal type and designated use, which calculated the criterion using the equation and appropriate hardness.

HARDNESS-DEPENDENT DISSOLVED METALS CRITERIA

CHEMICAL	STANDARDS														FRESHWATER CONVERSION FACTORS (CF)	
	A&Wc				A&Ww				A&Wedw				A&We			
	Acute		Chronic		Acute		Chronic		Acute		Chronic		Acute		ACUTE	CHRONIC
	m_A	b_A	m_C	b_C	m_A	b_A	m_C	b_C	m_A	b_A	m_C	b_C	m_A	b_A		
Cadmium	1.0166	-3.924	0.7409	-4.719	1.0166	-2.561	0.7409	-3.894	1.0166	-2.561	0.7409	-3.894	1.0166	-1.497	1.136672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]
Chromium III	0.8190	3.7256	0.8190	0.6848	0.8190	3.7256	0.8190	0.6848	0.8190	3.7256	0.8190	0.6848	0.8190	4.9361	0.316	0.860
Copper	0.9422	-1.7	0.8545	-1.702	0.9422	-1.7	0.8545	-1.702	0.9422	-1.7	0.8545	-1.702	0.9422	-1.1514	0.960	0.960
Lead	1.273	-1.460	1.273	-4.705	1.273	-1.460	1.273	-4.705	1.273	-1.460	1.273	-4.705	1.273	-0.7131	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]
Nickel	0.8460	2.255	0.8460	0.0584	0.8460	2.255	0.8460	0.0584	0.8460	2.255	0.8460	0.0584	0.8460	4.4389	0.998	0.997
Silver	1.72	-6.59	—	—	1.72	-6.59	—	—	1.72	-6.59	—	—	1.72	-6.59	0.85	—
Zinc	0.8473	0.884	0.8473	0.884	0.8473	0.884	0.8473	0.884	0.8473	0.884	0.8473	0.884	0.8473	3.1342	0.978	0.978

Hardness-dependent metals' criteria may be calculated from the following:
Acute (dissolved) = exp $\{m_A [\ln(\text{hardness})] + b_A\}$ (CF)
Chronic (dissolved) = exp $\{m_C [\ln(\text{hardness})] + b_C\}$ (CF)

Criteria for Pentachlorophenol

The criterion equation for pentachlorophenol requires the insertion of receiving water pH to develop the applicable water quality standards. The Department has prepared three tables in rule, by designated use, for pentachlorophenol standards. The equations to develop the water quality standards and companion tables are as follows:

A&Wc acute standard: $e^{(1.005\ (pH) - 4.830)}$

A&Wc chronic standard: $e^{(1.005\ (pH) - 5.290)}$

A&Ww acute standard: $e^{(1.005\ (pH) - 4.830)}$

A&Ww chronic standard: $e^{(1.005\ (pH) - 5.290)}$

A&Wedw acute standard: $e^{(1.005\ (pH) - 4.830)}$

A&Wedw chronic standard: $e^{(1.005\ (pH) - 5.290)}$

A&We acute standard: $e^{(1.005\ (pH) - 3.4306)}$

A&Wedw chronic criterion for dissolved mercury

The rulemaking revises the A&W(edw) chronic standard for dissolved mercury from 0.2 µg/L to 0.01 µg/L. The Department adopted the current A&W(edw) chronic criterion for dissolved mercury of 0.2 µg/L in 1992. The follow-

ing documentation on the calculation of the A&W(edw) chronic criterion for mercury from 1992 explains how this criterion was derived:

> "The proposed standard was based on toxicity to aquatic life. However, mercury has a propensity to accumulate in tissues of aquatic life to levels that may be harmful to wildlife or human consumers. These routes of exposure should also be considered in developing A&W standards. The EPA publication "Ambient Water Quality Criteria for Mercury – 1984," U.S. EPA, Office of Water, EPA 440/5-84-026 (January 1985) does not contain information regarding the effects of mercury on wildlife but does contain information on the effects of mercury on humans. Setting a standard based strictly on toxicity to aquatic life may not adequately protect wildlife. The rulemaking uses an FDA action level as a surrogate to protect wildlife. This seems appropriate because wildlife is more like humans than aquatic life. The mercury standard has been recalculated using the more appropriate Final Residue Value procedure (see "Ambient Water Quality Criteria for Mercury – 1984"). The equation used is:
>
> **FDA action level**
> **(Bioconcentration factor)**
>
> Where the FDA action level for mercury is 1.0 mg/kg and the bioconcentration factor for mercury is 4,994 L/kg. (Criteria Document, p. 47), the recalculated A&Wedw chronic standard is 0.2 µg/L.

The methodology used in 1992 to recalculate the A&Wedw chronic criterion has been modified. An FDA action level as a surrogate value is no longer supported to protect aquatic life and wildlife in EDWs. The bioconcentration factor of 4,994 L/kg used in 1992 to calculate the chronic criterion significantly underestimates the bioaccumulation potential of mercury in the aquatic environment. More recent information indicates that concentrations of total mercury in fish at the top of the food chain may be as much as 10,000 to 100,000 times higher than the concentrations of inorganic mercury found in surrounding waters (Source: EPA Fact Sheet, "Mercury Update: Impact on Fish Advisories," EPA-823-F-99-016 (September, 1999).

The rulemaking adopts the same chronic criterion for dissolved mercury that was adopted for the A&Wc and A&Ww designated uses. The Department employed the EPA methodology described in the national "Guidelines for Deriving Water Quality Criteria for the Protection of Aquatic Life and Its Uses" [hereafter referred to as the Guidelines Methodology] to derive water quality criteria for mercury. The Guidelines Methodology calls for the calculation of a Final Residue Value [FRV] if a maximum permissible tissue concentration and at least one acceptable bioconcentration factor determined from an aquatic species are available. The Department calculated a FRV for mercury using data from EPA's National Ambient Water Quality Criteria Document for Mercury – 1984. The FRV of 0.012 µg/L became the A&Wc and the A&Ww criterion to protect against chronic toxicity from mercury. The Guidelines Methodology is a more appropriate method to derive A&Wedw chronic criteria than the use of FDA action levels to calculate the A&Wedw (chronic) criterion.

Numeric Criteria for Total Ammonia for Effluent-Dependent Waters

This rulemaking adopts numeric water quality criteria for total ammonia for the A&Wedw designated use. The Clean Water Act requires the Department to adopt water quality standards for all uses including effluent dependent waters that contain sufficient parameters or constituents to protect designated uses. Ammonia is a major toxicant of concern in Arizona's effluent dependent waters. There is a large body of scientific literature documenting ammonia toxicity to aquatic life, including toxicity to species that are known to inhabit effluent dependent waters, however, the Department has not adopted numeric criteria to protect aquatic life in EDWs. The adoption of numeric water quality criteria for ammonia for the A&Wedw designated use is necessary to protect the use and will provide an objective basis for the establishment of water quality-based effluent limits in AZPDES permits to control toxic discharges of ammonia in wastewater to Arizona's effluent dependent waters.

The U.S. Fish & Wildlife Service has repeatedly recommended that the Department include ammonia as a pollutant to be regulated in Arizona's effluent dependent waters, noting that Arizona's EDWs are vital components of southwestern desert ecosystems, providing valuable replacement habitat for threatened and endangered species, including the Gila topminnow, Yuma clapper rail, and the Southwestern willow flycatcher, as well as other native and migratory birds.

The ammonia criteria are based on EPA's "1999 Update of Ambient Water Quality Criteria for Ammonia," U.S. Department of Environmental Quality, U.S. Environmental Protection Agency, Office of Water, EPA-822-R-99-014 (December 1999), EPA's most recent national § 304(a) criteria recommendations to protect freshwater aquatic life. The proposed ammonia criteria for A&Wedw are expressed as total ammonia concentrations (i.e., un-ionized ammonia (NH_3) + ionized ammonia (NH_4^+). The proposed criteria consist of both acute and chronic criteria.

Acute

The § 304(a) criteria for total ammonia to protect against acute toxicity are dependent on pH and the presence or absence of salmonids (i.e., large trout). Where salmonids are present, EPA recommends that the acute criterion be calculated using the following equation:

$$\textbf{Acute criterion} = \frac{0.275}{1 + 10^{7.204-pH}} + \frac{39.0}{1 + 10^{7.204-pH}}$$

The acute criterion for total ammonia was calculated for the A&Wc designated use using the equation recommended by EPA above. The results may be found in the first column of Table 26 in the current surface water quality standards rules. There are no revisions of acute A&Wc criteria in this rulemaking.

Where salmonid fish are not present, EPA recommends the calculation of acute criteria for total ammonia to protect aquatic life using the following equation:

$$\textbf{Acute criterion} = \frac{0.411}{1 + 10^{7.204-pH}} + \frac{58.4}{1 + 10^{7.204-pH}}$$

The acute criterion for total ammonia was calculated for the A&Ww and the A&Wedw designated uses using this equation. The results may be found in the second column of Table 25 of the surface water quality standards rules. There are no revisions to the resulting numeric criteria for the A&Ww (acute) designated use in this rulemaking.

This rulemaking applies the same numeric criteria for the A&Ww (acute) designated use to protect the A&Wedw (acute) designated use. The Department recalculated the A&Wedw (acute) criteria using the EPA Guidelines methodology and adjusting the species toxicity datasets using representative species from effluent dependent waters. The use of recalculation procedures did not result in any significant differences between A&Wedw and A&Ww acute criteria because the same species that are sensitive to ammonia toxicity that "drive" the criteria derivation are found in both warm surface waters and EDWs. The table below illustrates the minimal differences between the A&Ww (acute) criteria and the re-calculated A&Wedw acute criteria:

pH	Calculated A&Ww (in mg/L)	Recalculated A&Wedw (in mg/L)
6.5	47.6	48.9
6.6	45.7	46.9
6.7	43.5	44.6
6.8	41.0	42.0
6.9	38.2	39.2
7.0	35.2	36.1
7.1	32.0	32.9
7.2	28.8	29.6
7.3	25.6	26.2
7.4	22.4	23.0
7.5	19.4	19.9
7.6	16.6	17.0
7.7	14.1	14.5
7.8	11.8	12.2
7.9	9.9	10.1
8.0	8.2	8.4
8.1	6.8	7.0
8.2	5.6	5.7
8.3	4.6	4.7
8.4	3.8	3.9
8.5	3.1	3.2
8.6	2.6	2.7
8.7	2.1	2.2
8.8	1.8	1.8
8.9	1.5	1.6
9.0	1.3	1.3

Chronic

The A&W (chronic) criteria for total ammonia are dependent on both pH and temperature. The national § 304(a) recommendations for chronic toxicity for total ammonia that apply when early life stages of fish are expected to be present have been adopted because of the likelihood that early life stages of fish may be present in Arizona surface waters (including EDWs) at any time during the year. The following equation was used to calculate the chronic criteria for total ammonia for the A&Wc, A&Ww, and A&Wedw designated uses:

$$\text{Chronic criteria} = \left(\frac{0.0577}{1 + 10^{7.688 - \text{pH}}} + \frac{2.487}{1 + 10^{\text{pH} - 7.688}}\right) \times \text{MIN } 2.85,\ 1.45 \times 10^{0.028 \times (25 - \text{T})}$$

The results are found in Appendix A within Table 26. The chronic criteria are not species dependent and apply equally to the A&Wc, A&Ww, and A&Wedw designated uses. The chronic criteria for total ammonia become more stringent as temperature and pH values increase.

The following table shows proposed changes to the aquatic and wildlife criteria: The table identifies the pollutant, the current A&W criteria, the proposed A&W criteria, and the reasons for any proposed changes.

Numeric Water Quality Standards for Aquatic and Wildlife Designated Uses

Pollutant	Existing A&W Criteria (µg/L)	Proposed A&W Criteria (µg/L)	Reason for Change
Aldrin	A&W(c) acute: 2.0 A&W(w) acute: 2.0 A&Wedw acute: 2.0	A&W(c) acute: 3 A&W(w) acute: 3 A&Wedw acute: 3	Less stringent. The § 304(a) national criteria recommendations for aldrin have been adopted.
Ammonia	A&Wedw acute: NNS A&Wedw chronic: NNS	Acute and chronic A&Wedw criteria See Tables 25 and 26	The ammonia criteria for A&Wedw have been updated based on EPA § 304(a) national criteria recommendations. See discussion under "Numeric Water Quality Standards for Aquatic and Wildlife Designated Uses" above.
Arsenic	A&Wc acute: 360 A&Ww acute: 360 A&Wedw acute: 360 A&Wc chronic: 190 A&Ww chronic: 190 A&Wedw chronic: 190	A&Wc acute: 340 A&Ww acute: 340 A&Wedw acute: 340 A&Wc chronic: 150 A&Ww chronic: 150 A&Wedw chronic: 150	More stringent. The § 304(a) national criteria recommendations for arsenic have been adopted.
Beryllium	A&Wc acute: 65 A&Ww acute: 65 A&Wedw acute: 65 A&Wc chronic: 5.3 A&Ww chronic: 5.3 A&Wedw chronic: 5.3	None	EPA has withdrawn its national § 304(a) criteria recommendations to protect aquatic life for beryllium.
Chlordane	A&Wc acute: 2.4 A&Ww acute 2.4 A&Wedw acute: 2.4 A&Ww chronic: 0.21 A&Wedw chronic: 0.21	A&Wc acute: 2.4 A&Ww acute: 2.4 A&Wedw acute: 2.4 A&Ww chronic: 0.2 A&Wedw chronic: 0.2	The standard has been rounded to the first significant figure to the right of the decimal point.
Chlorine (total residual)	A&Wc acute: 11 A&Ww acute: 11 A&Wedw acute: 11 A&Wc chronic: 5 A&Ww chronic: 5 A&Wedw chronic: 5	A&Wc acute: 19 &Ww acute: 19 A&Wedw acute: 19 A&Wc chronic: 11 A&Ww chronic: 11 A&Wedw chronic: 11	Less stringent. The § 304(a) national criteria recommendations for chlorine have been adopted.
Chloropyrifos	None	A&Wc acute: 0.08 A&Ww acute: 0.08 A&Wedw acute: 0.08 A&Wc chronic: 0.04 A&Ww chronic: 0.04 A&Wedw chronic: 0.04	New parameter. The § 304(a) national criteria recommendations for chloropyrifos have been adopted.

p,p'-Dichlorodiphenyl dichloroethane (DDD)	A&Ww chronic: 0.02 A&Wedw chronic: 0.02	A&Ww chronic: 0.001 A&Wedw chronic: 0.001	More stringent. DDD and DDE have been consolidated with DDT. The more stringent chronic criterion for DDT (0.001) has been adopted for DDD. DDD is a daughter product of DDT. The criterion is based on EPA § 304(a) national criteria recommendations.
p,p'-Dichlorodiphenyl dichloroethylene (DDE)	A&Ww chronic: 0.02 A&Wedw chronic: 0.02	A&Ww chronic: 0.001 A&Wedw chronic: 0.001	More stringent. DDD and DDE has been consolidated with DDT. The more stringent chronic criterion for DDT (0.001) has been adopted for DDE. DDE is a daughter product of DDT. The criterion is based on EPA § 304(a) national criteria recommendations.
Dieldrin	A&Wc acute: 2.5 A&Ww acute: 2.5 A&Wedw acute: 2.5 A&Wc chronic: 0.002 A&Ww chronic: 0.002 A&Wedw chronic: 0.005	A&Wc acute: 0.2 A&Ww acute: 0.2 A&Wedw acute: 0.2 A&Wc chronic: 0.06 A&Ww chronic: 0.06 A&Wedw chronic: 0.06	The more stringent acute criteria and less stringent chronic criteria for dieldrin based on EPA § 304(a) national criteria recommendations have been adopted.
Endosulfan	A&Wc acute: 0.22 A&Ww acute: 0.22 A&Wedw acute: 0.22	A&Wc acute: 0.2 A&Ww acute: 0.2 A&Wedw acute: 0.2	The standard has been rounded to first significant figure to right of decimal point
Endosulfan sulfate	A&Wc acute: 0.22 A&Ww acute: 0.22 A&Wedw acute: 0.22	A&Wc acute: 0.2 A&Ww acute: 0.2 A&Wedw acute: 0.2	The standard has been rounded to first significant figure to right of decimal point
Endrin	A&Wc acute: 0.18 A&Ww acute: 0.18 A&Wedw acute: 0.18 A&Wc chronic: 0.002 A&Ww chronic: 0.002 A&Wedw chronic: 0.002	A&Wc acute: 0.09 A&Ww acute: 0.09 A&Wedw acute: 0.09 A&Wc chronic: 0.04 A&Ww chronic: 0.04 A&Wedw chronic: 0.04	The more stringent acute criteria and less stringent chronic criteria for endrin based on EPA § 304(a) national criteria recommendations have been adopted
Endrin aldehyde	A&Wc acute: 0.18 A&Ww acute: 0.18 A&Wedw acute: 0.18 A&Wc chronic: 0.002 A&Ww chronic: 0.002 A&Wedw chronic: 0.002	A&Wc acute: 0.09 A&Ww acute: 0.09 A&Wedw acute: 0.09 A&Wc chronic: 0.04 A&Ww chronic: 0.04 A&Wedw chronic: 0.04	The rulemaking adopts more stringent acute criteria and less stringent chronic criteria for endrin aldehyde. Proposed criteria are based on EPA § 304(a) national criteria recommendations
Guthion	None	A&Wc chronic: 0.01 A&Ww chronic: 0.01 A&Wedw chronic: 0.01	New parameter. The criteria are based on EPA § 304(a) national criteria recommendations.
Heptachlor	A&Wc acute: 0.52 A&Ww acute: 0.52 A&Wedw acute: 0.58 A&Wedw chronic: 0.013	A&Wc acute: 0.5 A&Ww acute: 0.5 A&Wedw acute: 0.6 A&Wedw chronic: 0.01	The standard has been rounded to first significant figure to right of decimal point
Heptachlor epoxide	A&Wc acute: 0.52 A&Ww acute: 0.52 A&Wedw acute: 0.58 A&Wedw chronic: 0.013	A&Wc acute: 0.5 A&Ww acute: 0.5 A&Wedw acute: 0.6 A&Wedw chronic: 0.01	The standard has been rounded to first significant figure to right of decimal point
Hexachlorobenzene	A&Ww acute: NNS A&Wedw acute: NNS A&Ww chronic: NNS A&Wedw chronic: NNS	A&Ww acute: 6 A&Wedw acute: 6 A&Ww chronic: 3.7 A&Wedw chronic: 3.7	The rulemaking adopts criteria for A&Ww and A&Wedw based on EPA § 304(a) national criteria recommendations.

Hexaclorocyclohexane gamma (lindane)	A&Wc acute: 2.0 A&Ww acute: 3.4 A&Wedw acute: 7.6 A&Wc chronic: 0.08 A&Ww chronic: 0.28 A&Wedw chronic: 0.61	A&Wc acute: 1 A&Ww acute: 1 A&Wedw acute: 1 A&Wc chronic: None A&Ww chronic: None A&Wedw chronic: None	Based on EPA § 304(a) national criteria recommendations, the more stringent acute criteria has been adopted and the chronic criteria for lindane has been repealed.
Hydrogen sulfide	None	A&Wc chronic: 2 A&Ww chronic: 2 A&Wedw chronic: 2	New pollutant. Replaces "sulfides." Proposed criteria are based on EPA § 304(a) national criteria recommendations
Iron	None	A&Wc chronic: 1,000 A&Ww chronic: 1,000 A&Wedw chronic: 1,000	New pollutant. The § 304(a) national criteria recommendations have been adopted.
Malathion	None	A&Wc chronic: 0.1 A&Ww chronic: 0.1 A&Wedw chronic: 0.1	New pollutant. The § 304(a) national criteria recommendations have been adopted
Mercury	A&Wedw acute: 2.6 A&Wedw chronic: 0.2	A&Wedw acute: 2.4 A&Wedw chronic: 0.01	See discussion under "Numeric Water Quality Standards for Aquatic and Wildlife Designated Uses" above.
Methoxychlor	A&Wc chronic: NNS A&Ww chronic: NNS A&Wedw chronic: NNS	A&Wc chronic: 0.03 A&Ww chronic: 0.03 A&Wedw chronic: 0.03	The § 304(a) national criteria recommendations have been adopted
Mirex	None	A&Wc chronic: 0.001 A&Ww chronic: 0.001 A&Wedw chronic: 0.001	Newly regulated pollutant. The § 304(a) national criteria recommendations have been adopted
Parathion	None	A&Wc acute: 0.07 A&Ww acute: 0.07 A&Wedw acute: 0.07 A&Wc chronic: 0.01 A&Ww chronic: 0.01 A&Wedw chronic: 0.01	Newly regulated pollutant. The § 304(a) national criteria recommendations have been adopted
Paraquat	None	A&Wc acute: 100 A&Ww acute: 100 A&Wedw acute: 100 A&Wc chronic: 54 A&Ww chronic: 54 A&Wedw chronic: 54	Newly regulated pollutant. The § 304(a) national criteria recommendations have been adopted
Permethrin	None	A&Wc acute: 0.3 A&Ww acute: 0.3 A&Wedw acute: 0.3 A&Wc chronic: 0.2 A&Ww chronic: 0.2 A&Wedw chronic: 0.2	Newly regulated pollutant. The § 304(a) national criteria recommendations have been adopted
Phenanthrene	A&Wedw acute: 54	A&Wedw acute: 30	The EPA § 304(a) national criteria recommendation for A&Wedw acute criterion have been adopted.
Selenium	A&Wc acute: 20 T A&Ww acute: 20 T A&Wedw acute: 50 T	A&Wc acute: None A&Ww acute: None A&Wedw acute: None	The § 304(a) national criteria recommendations for acute criteria, expressed as concentrations of selenate and selenite have been repealed.
Sulfides	A&Wc acute: 100 A&Ww acute: 100 A&Wedw acute: 100 A&We: 100	None	"Sulfides" has been replaced with "hydrodgen sulfide."

2,3,7,8-Tetrachlorod-ibenzo-p-dioxin (2,3,7,8-TCDD)	A&Wedw acute: 0.12 A&Wedw chronic: 0.01	A&Wedw acute: 0.1 A&Wedw chronic: 0.005	The A&Wedw acute standard has been rounded to the first significant figure to right of decimal point. The more stringent A&Wedw chronic criterion has been adopted to be consistent with EPA § 304(a) national criteria recommendations for dioxin.
Toxaphene	A&Wc acute: 0.73 A&Ww acute: 0.73 A&Wedw acute: 0.73 A&Wc chronic: 0.0002 A&Ww chronic: 0.02 A&Wedw chronic: 0.02	A&Wc acute: 0.7 A&Ww acute: 0.7 A&Wedw acute: 0.7 A&Wc chronic: 0.0002 A&Ww chronic: 0.0002 A&Wedw chronic: 0.0002	Acute criteria has been amended by rounding to the first significant figure to the right of the decimal point. The more stringent A&Ww chronic and A&Wedw chronic criteria have been adopted to be consistent with national § 304(a) criteria recommendations for toxaphene.
Tributyltin	None	A&Wc acute: 0.5 A&Ww acute: 0.5 A&Wedw acute: 0.5 A&Wc chronic: 0.07 A&Ww chronic: 0.07 A&Wedw chronic: 0.07	Newly regulated pollutant. The § 304(a) national criteria recommendations for A&Wc, A&Ww and A&Wedw have been adopted.
1,2,4-Trichlorobenzene	A&Wedw acute: NNS A&Wedw chronic: NNS	A&Wedw acute: 1,700 A&Wedw chronic: 300	The current acute and chronic A&Ww criteria for A&Wedw have been adopted

Appendix B. Surface Waters and Designated Uses

Appendix B lists surface waters and their designated uses. The geographic descriptions in Appendix B has been updated and reformatted. Lake categories have been added, when known.

The following 29 new effluent dependent waters identified have been classified using information provided by the AZPDES permit program. The new effluent dependent waters are created by point source discharges of wastewater to ephemeral waters. Information from AZPDES permit applications, fact sheets, and discharge monitoring reports for each point source document discharges of wastewater to the effluent dependent waters.

1. Coconino Wash from the South Grand Canyon Sanitary District Tusayan WRF outfall to 1 km downstream.
2. Unnamed wash from Grand Canyon National Park Desert View WWTP to Cedar Canyon.
3. Unnamed wash from Valle Airpark WRF outfall to confluence with Spring Wash.
4. Tyson Wash from Town of Quartzite WWTP to 1 km downstream.
5. Puerco River from Sanders Unified School District WWTP to 0.5 km downstream.
6. Unnamed wash from High Country Pines II WWTP to Turkey Draw to confluence with Black Canyon Creek.
7. Unnamed wash from Bison Ranch WWTP outfall to Pierce Seep.
8. Unnamed wash from Black Mesa Ranger Station WWTP to confluence with Pierce Wash.
9. Pine Canyon Golf Course storage ponds 4I, 6E, and 10D to unnamed tributaries of Rio de Flag.
10. Agua Fria River from City of Avondale WWTP to Gila River.
11. Andorra Wash from Town of Cave Creek WWTP outfall #1 to Cave Creek Wash.
12. Gallaway Wash from Town of Cave Creek WWTP outfall #2 to confluence with Andorra Wash.
13. McMicken Wash from City of Peoria Jomax WWTP to Agua Fria River.
14. Mountain Valley Park ponds from Town of Prescott Valley WWTP outfall 002 to Navajo Wash.
15. Salt River from City of Mesa Northwest WWTP to Tempe Town Lake.
16. Siphon Draw from Superstition Mountains Community Facilities District WWTP to 6 km downstream.
17. Unnamed wash from City of Phoenix Cave Creek WRF to 0.5 km downstream.
18. Unnamed wash from North Florence WWTP, tributary to Gila River.

19. Wagner Wash from Town of Buckeye Festival Ranch WRF to Hassayampa River.
20. Black Wash from Pima County WWMD Avra Valley WWTP to Brawley Wash.
21. North Branch of Santa Cruz Wash from City of Casa Grande WRF to 1 km downstream.
22. Santa Rosa Wash from Palo Verde Utilities WWTP to Gila River Indian Reservation.
23. Unnamed wash from Arizona City Sanitary District WWTP to Santa Cruz Wash.
24. Unnamed wash from Saddlebrooke WWTP to Canada del Oro.
25. Unnamed wash from Fort Huachuca WWTP to Soldier Creek to Babocomari River.
26. Pinal Creek from Lower Pinal Creek WTP to See Ranch Crossing.
27. Unnamed wash from Cobre Valley Plaza WWTP to Russell Gulch.
28. Dry Creek from Sedona Venture WWTP to confluence with Oak Creek.
29. Unnamed wash from Flagstaff Meadows WWTP to Volunteer Wash.

The rulemaking removes the Cholla Reservoir from Appendix B. In the early 1990s, the Cholla Reservoir, a manmade cooling pond for the Arizona Public Service Co. (APS) Cholla Power Plant near Joseph City, Arizona, was issued a National Pollutant Discharge Elimination System permit by EPA based on the agency's understanding that the reservoir had been constructed in a water of the United States. As a result of this understanding, the Cholla Reservoir was added to the state's list of surface waters in Appendix B. Recent investigation finds that the Cholla Reservoir is a 100 acre manmade impoundment constructed by APS in 1961 to serve as a cooling pond for the power plant. It is a terminal impoundment without any outflow to what would otherwise be considered a "water of the United States." The source of water for the Cholla Reservoir is pumped groundwater. As the Cholla Reservoir was not created by impounding any "water of the United States," nor was the reservoir created within a "water of the United States," the reservoir has been removed from Appendix B based on a new exclusion at R18-11-102(B)(3).

Appendix C. Site-Specific Standards

This new Appendix lists site-specific standards.

Site-Specific Standard for Copper for Pinto Creek

The site-specific standard for dissolved copper in Pinto Creek was determined through watershed modeling procedures that were used to calculate the natural background concentration of dissolved copper in the defined reach of Pinto Creek. The modeling procedures are described in "Pinto Creek Site-Specific Water Quality Standard for Dissolved Copper," Arizona Department of Environmental Quality, (March 12, 2007), the Phase II TMDL analysis for the Pinto Creek watershed.

Site-Specific Standards for Yuma East Wetlands

The site-specific standards for total selenium and total residual chlorine for the Yuma East Wetlands Project are supported by a request by the City of Yuma to modify the two standards on grounds of net ecological benefit. The modification of the water quality standards for selenium and total residual chlorine will enable the City of Yuma to discharge spent filter backwash water from their Main Street Water Treatment Plant to the Yuma East Wetlands Project. The Yuma East Wetlands Project is a multi-million dollar river ecosystem restoration effort designed to restore, enhance, and augment riparian habitats for native and sensitive riparian plant and wildlife species, and to create natural history and cultural interpretation centers and recreational facilities along the Lower Colorado River. The restoration of these habitats depends upon the discharge of filter backwash water to maintain adequate flows of water in the wetlands, particularly during periods of low flow in the Colorado River. Without the discharge of the filter backwash water, the viability of a large portion of the Yuma Wetlands East Project would be jeopardized.

Under R18-11-106, the Director may modify a water quality standard on the grounds that there is a net ecological benefit associated with the discharge of effluent to support or create a riparian and aquatic habitat in an area where water resources are limited.

The Director has determined the conditions of R18-11-106 have been met to support modifications of the water quality standards for selenium and total residual chlorine and to allow the discharge of filter backwash water for flow augmentation in the Yuma East Wetlands on grounds of net ecological benefit. The Director has determined that a net ecological benefit is clearly demonstrated by the Yuma East Wetlands project.

The environmental benefits associated with the discharge of filter backwash water to support the restoration of the Yuma East Wetlands outweigh the environmental costs associated with eliminating the discharge. The discharge of filter backwash water for flow augmentation is essential to the maintenance and restoration of open water and marshland habitats within the wetlands. Only the discharge of filter backwash water can assure the continual water flow necessary to maintain the marshes of the Yuma East Wetlands.

The cost of treatment to achieve compliance with the selenium and total residual chlorine standards are prohibitive and it would be more cost-effective to eliminate the discharge of the filter backwash water to the wetlands instead of

installing the necessary treatment processes. Achieving compliance with the total residual chlorine standard would require the installation and operation of a dechlorination facility at the water treatment plant. The City of Yuma estimates that the capital cost of a de-chlorination facility are in excess of $1 million dollars. The estimated cost of compliance with the selenium standard would require the installation of reverse osmosis or a similar treatment process to remove dissolved solids from the spent filter backwash water. The City of Yuma estimates the capital cost of selenium treatment to be $8.2 million with estimated operation and maintenance costs of $1.3 million per year. The City of Yuma described these costs as "economically impossible." Moreover, it is feasible for the City of Yuma to completely eliminate the discharge of filter backwash to the Yuma East Wetlands. Spent filter backwash is currently recycled within the water treatment plant and is not discharged. There are no costs associated with maintaining the status quo of recycling the filter backwash water instead of discharging it to augment flows in the wetlands. The City of Yuma could avoid the compliance costs associated with meeting the selenium and chlorine standards by not discharging their filter backwash water to the wetlands. However, the success of the wetlands project would be jeopardized if the City of Yuma exercised that option.

The discharge of filter backwash water that meets the site-specific standards will not cause or contribute to a violation of a water quality standard for a downstream surface water. The concentration of total residual chlorine in the filter backwash water is not anticipated to cause or contribute to a violation of the chlorine standard that applies to the adjacent Colorado River. Concentrations of chlorine are expected to dissipate in the filter backwash water pipeline, at the point of discharge to the wetlands, and by retention within the wetlands and marsh habitats. With regard to selenium, the City of Yuma does not add or remove selenium from the filter backwash water at its water treatment plant. The concentration of selenium in the filter backwash water is the same as the concentration of selenium in its raw intake water from the Colorado River.

The City of Yuma demonstrated that it is implementing all practicable discharge control programs to reduce and limit the concentration of chlorine in its filter backwash water. The Department agrees with the City that there are no practicable discharge control programs that the City can implement to reduce selenium in its raw source water or in its filter backwash water.

The discharge of filter backwash water does not produce or contribute to the concentration of a bioaccumulative pollutant that is likely to be harmful to humans or wildlife through food chain concentration. This condition is met with regard to chlorine because chlorine is not a bioaccumulative pollutant. While selenium is a bioaccumulative pollutant, the discharge of filter backwash water does not produce or contribute to selenium concentrations in either the Yuma East Wetlands or in the Colorado River. The concentration of selenium in the filter backwash water is the same as that found in the raw source water from the Colorado River.

The rulemaking modifies the water quality standard applicable to this discharge for total residual chlorine to protect aquatic life from acute and chronic toxicity. The acute criterion is 33 µg/L and the chronic criterion is 20 µg/L. These criteria are based on EPA recalculation procedures and the species list for chlorine toxicity, which is located on the EPA web site at www.epa.gov/region7/water/chlorine. The only adjustment made in the recalculation procedure was to remove *Daphnia magna* from the toxicity dataset. The resulting chlorine criteria, calculated from the modified dataset, are the criteria of 33 µg/L and 20 µg/L.

The rulemaking modifies chronic selenium criterion applicable to this discharge to protect aquatic life of 2.2 µg/L. This concentration is based on the highest selenium concentration that has been measured in the receiving water within the Yuma East Wetlands. This concentration represents the observed background concentration in the lower Colorado River. The site-specific criterion is slightly less stringent than the default A&Ww chronic criterion for selenium of 2 µg/L in the current rules and it is more stringent than EPA's 304(a) national recommended chronic criterion for selenium to protect freshwater aquatic life of 5 µg/L. The Department notes that the U.S. Fish & Wildlife Service has written a letter of support for the site-specific modifications of the selenium and chlorine standards for the Yuma East Wetlands project.

Site-Specific Standard for Copper for Rio de Flag

The site-specific dissolved copper standards for the Rio de Flag currently found in R18-11-113(F) have been moved to Appendix C.

6. A reference to any study relevant to the rule that the agency reviewed and proposes either to rely on or not to rely on in its evaluation of or justification for the rule, where the public may obtain or review each study, all data underlying each study, and any analysis of each study and other supporting material:

"Antidegradation Implementation Procedures," Arizona Department of Environmental Quality, Water Quality Division, (July 2007)

"Biocriteria Implementation Procedures," Arizona Department of Environmental Quality, Water Quality Division, (April 2007)

"Technical Support Documentation for the Narrative Biocriteria Standard," Arizona Department of Environmental Quality, Water Quality Division, (April 2007)

A monograph by Thomas F. Walters summarizing the results of the scientific research on the effects of sediment on stream biota, "Sediment in Streams: Sources, Biological Effects and Control," American Fisheries Society Monograph 7, American Fisheries Society, Bethesda, Maryland (1995)

"Narrative Bottom Deposits Standard Implementation Procedures for Wadeable, Perennial Streams," Arizona Department of Environmental Quality, Water Quality Division, (April 2007)

"Ambient Water Quality Criteria for Bacteria – 1986," U.S. Environmental Protection Agency, Office of Water, EPA 440/5-84-002 (January, 1986)

"Fossil Creek: State of the Watershed Report," Northern Arizona University (July 2005)

"Water Quality Criterion for the Protection of Human Health: Methylmercury," U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, EPA-823-R-01-001 (January 2001)

"Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health," U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, EPA-822-B-00-004, (October 2000)

"Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses," U.S. Environmental Protection Agency, Office of Research and Development, EPA 822/R-85-100, (1985)

"Ambient Water Quality Criteria for Mercury – 1984," U.S. EPA, Office of Water, EPA 440/5-84-026 (January 1985)

"1999 Update of Ambient Water Quality Criteria for Ammonia," U.S. Environmental Protection Agency, Office of Water, EPA-822-R-99-014 (December 1999)

"Pinto Creek Site-Specific Water Quality Standard for Dissolved Copper," Arizona Department of Environmental Quality, Water Quality Division, (March 12, 2007)

"Sediment in Streams: Sources, Biological Effects and Control," American Fisheries Society Monograph 7, American Fisheries Society, Bethesda, Maryland (1995)

7. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable

8. The preliminary summary of the economic, small business, and consumer impact:

A. Estimated Costs and Benefits to the Department of Environmental Quality.

The Department does not expect this rulemaking to increase or decrease costs for the Arizona Department of Environmental Quality. It is possible however, that new or revised water quality standards and new implementation procedures for narrative standards could lead to an increase in the number of surface waters that are identified as impaired waters. This could result in a corresponding increase in the number of Total Maximum Daily Load (TMDLs) that the Department would be required to complete. New TMDLs are prioritized by the Department and would have to be completed within the next 10 years. The Department does not anticipate any increase in FTEs or state funding to complete any additional TMDLs.

B. Estimated Costs and Benefits to Political Subdivisions.

Some of the revisions to the rules may affect political subdivisions of Arizona that operate wastewater treatment plants that discharge wastewater to surface waters regulated by surface water quality standards. In particular, the adoption of numeric water quality criteria for ammonia in surface waters with the A&Wedw designated use may result in new water quality-based discharge limitations in AZPDES permits for wastewater treatment plants discharging to existing EDW designated or ephemeral streams.

Wastewater treatment plants and other point source dischargers may be required to upgrade their treatment processes to control ammonia in discharges to effluent dependent waters. Nitrogen removal is already a requirement of the Aquifer Protection Program (APP) for the protection of human health in meeting the aquifer water quality standard of 10 mg/L and Best Available Demonstrated Control Technology (BADCT) requirements. Adoption of ammonia standards will be a parallel, regulatory requirement under the surface water program for the protection of aquatic life which have a very low tolerance for ammonia toxicity.

The most cost-effective method of ammonia removal is accomplished through biological nutrient removal (BNR) processes. Total nitrogen in effluents discharged from wastewater treatment plants is typically composed of ammonia, nitrate, organic nitrogen, and soluble organic nitrogen. The biological processes that remove these forms of nitrogen from effluent are called nitrification and denitrification.

Overview of BNR systems

There are a number of BNR treatment processes currently available to remove ammonia and nitrate from wastewater. The BNR configuration that is appropriate for any particular wastewater treatment plant depends on the target effluent quality (e.g., the applicable ammonia and nitrate criteria), wastewater treatment plant operator experience, influ-

ent quality, and existing wastewater treatment processes (if retrofitting an existing facility to meet the standards). Common BNR systems to remove total nitrogen include:

- Modified Ludzack-Ettinger (MLE) Process (a continuous flow suspended growth process with an initial anoxic stage followed by an aerobic stage);
- A^2/O Process (a MLE process preceded by an initial anoxic stage);
- Bardenpho Process (continuous flow suspended growth process with alternating anoxic/anaerobic stages;
- Sequencing Batch Reactor (SBR) Process (suspended growth batch process sequenced to simulate the four stage Bardenpho process);
- Rotating Biological Contactor (RBC) Process (a continuous flow process using rotating biological contactors in sequential anoxic/anaerobic stages); and
- Oxidation Ditch Process (a continuous flow process using looped channels to create time-sequenced anoxic, aerobic, and anaerobic zones).

Choosing which treatment system is most appropriate for a specific wastewater treatment plant depends primarily on the applicable water quality standards that must be met and whether the facility is a new facility or a retrofit of an existing facility. In general, new wastewater treatment plants have more flexibility and options when deciding which BNR system to implement because they are not constrained by existing treatment processes and sludge handling procedures. Retrofitting an existing wastewater treatment plant to provide ammonia removal involves consideration of a number of factors:

- Aeration basin size and configuration,
- Clarifier capacity,
- Type of aeration system,
- Sludge processing units, and
- Operator experience.

The aeration basin size and configuration of an existing wastewater treatment plant dictates which BNR configurations are the most economical and feasible. If a wastewater treatment plant has available excess capacity, it may reduce the need for construction of additional basins and it may allow for a more complex BNR configuration. The need for additional basins can result in the need to purchase additional land if the space needed is not available. If land is not available, another BNR configuration may have to be considered. Clarifier capacity influences the effluent suspended solids concentration which affects effluent total nitrogen levels. Existing clarifiers may need to be modified to achieve target total nitrogen levels in the effluent that is discharged. Similarly, the existing aeration system will most likely need to be modified to provide for aerobic and anaerobic zones in the wastewater treatment train. Also, the manner in which sludge is processed at an existing wastewater treatment plant will be important to the design of the BNR system. Sludge must be recycled within the wastewater treatment process to provide the organisms and bacteria necessary for ammonia and nitrate removal, and operators should be able to adjust treatment processes to compensate for changing conditions in the plant. BNR treatment processes are sensitive to influent conditions, including weather events and sludge processing. Sufficient operator skill and training are essential for achieving the target effluent concentrations of ammonia and total nitrogen.

Costs of BNR systems

BNR treatment systems will differ for new wastewater treatment plants and retrofits. New plant BNR costs are based on estimated influent quality, target effluent quality, and available funding. Retrofit costs are more site-specific and may vary considerably for any given size category of wastewater treatment plant. No economic studies have been conducted in Arizona to estimate the costs of upgrading wastewater treatment plants to provide BNR. However, EPA conducted studies in Maryland and Connecticut for BNR upgrade costs, which are provided below to illustrate the potential costs associated with retrofitting existing wastewater treatment plants in Arizona.

BNR UPGRADE COSTS FOR MARYLAND WASTEWATER TREATMENT PLANTS

Facility Name	Design Capacity (mgd)	Treatment Process	Total Capital BNR Cost (in 2006$)
Aberdeen	2.8	MLE	$3,177,679
Annapolis	10	Ringlace	$14,687,326
Back River	180	MLE	$138,305,987
Ballenger	2.0	Modified Bardenpho	$2,891,906
Broadneck	6.0	Oxidation ditch	$3,165,193

Broadwater	2.0	MLE	$6,892,000
Cambridge	8.1	Activated sludge	$11,740,209
Celanese	1.25	Sequential step feed	$7,424,000
Centreville	0.375	SBR/Land application	$7,336,020
Chesapeake Beach	0.75	Oxidation ditch	$2,158,215
Conococheague	2.5	Carrousel	$6,620,888
Cox Creek	15	MLE	$11,466,657
Cumberland	15	MLE	$12,929,990
Denton	0.45	Biolac	$4,203,767
Dorsey Run	2.0	Methanol	$3,967,307
Emmitsburg	0.75	Overland	$2,562,722
Frederick	8.0	MLE	$11,916,504
Freedom District	3.5	Activated Sludge	$1,462,798
Fruitland	0.50	SBR	$7,546,764
Hagerstown	8.0	Johannesburg Process	$11,190,344
Havre DeGrace	1.89	MLE	$7,596,882
Hurlock	2.0	Bardenpho	$5,200,000
Joppatowne	0.95	MLE	$2,433,205
La Plata	1.0	MLE	$4,952,150
Leonardtown	0.65	Biolac	$2,811,448
Little Patuxent	18	A^2/O	$7,263,879
Marlay Taylor	4.5	Schreiber	$4,986,641
Maryland City	2.5	Schreiber	$1,375,866
Maryland Correctional Institute	1.23	Bardenpho	$2,703,932
Mt. Airy	0.60	Activated sludge	$5,235,575
Northeast	2.0	Activated sludge	$4,225,029
Parkway	7.5	Methanol	$15,869,228
Patuxent	6.0	Oxidation ditch	$2,106,763
Piscataway	30	MLE	$24,778,239
Pocomoke City	1.4	Biolac	$3,924,240
Poolesville	0.625	SBR	$1,593,640
Princess Anne	1.26	Activated Sludge	$4,311,742
Seneca	5.0	MLE	$34,886,034
Sod Run	12	MLE	$21,999,198
Taneytown	0.70	SBR	$3,808,298
Thurmont	1.0	MLE	$3,122,264
Western Branch	30	Methanol	$47,132,782
Westminster	5.0	Activated Sludge	$5,274,444

The capital costs range from a low of $1,375,866 for a 2.5 mgd plant for Maryland City to a high, for the 180 mgd Back River WWTP, of $138,305,987. The same EPA report, *Biological Nutrient Removal Processes and Costs*, provides costs for BNR upgrades to existing wastewater treatment plants in Connecticut. The total costs of BNR retrofits ranged from $649,320 to $22,074,225.

These figures appear on the low end of what the Department has seen in working with municipalities in recent years. Based on conversations with various municipalities, new plant costs for BNR technology in Arizona likely range from $6-12 per gallon while retrofit facilities may cost as little as $2-4 per gallon but likely average in the $6-8 per gallon range which is in keeping with EPA's calculated average unit capital costs shown below. One example for which there are estimates is the upgrade to the Nogales International Wastewater Treatment Plant in Nogales, Arizona for full nitrification and denitrification using the MLE process. The project will cost over $62 million dollars for a 14.7 mgd facility. Cost per treatment gallon is approximately $4.40 estimated annual operating costs are $5.3 million.

The EPA study underscores that site-specific factors such as existing treatment system layout and space availability may cause costs to vary significantly between treatment plants with the same design capacities that are implementing the same type of BNR treatment upgrade. The study shows that despite this variability in costs, the unit cost per mgd generally decreases as the size of the wastewater treatment plant increases due to economies of scale. EPA calculated the average unit capital costs for BNR upgrades at the Maryland and Connecticut wastewater treatment plants as follows:

Average Unit Capital Costs for BNR Upgrades at MD and CT Wastewater Treatment Plants	
Flow (in mgd)	**Cost/mgd (in $2006)**
> 0.1 – 1.0	$6,972,000
> 1.0 – 10.0	$1,742,000
> 10.0	$588,000

The EPA study of BNR costs for retrofitting wastewater treatment plants in Maryland and Connecticut demonstrates that the cost of upgrading existing wastewater treatment plants in Arizona to provide BNR treatment to remove ammonia and nitrate from effluents may be substantial for some communities. However, it is important to restate that denitrification is already required as a result of the APP program and so the Department expects that the additional reductions necessary to meet surface water quality standards will not require capital expenditures to the same level as initial upgrades to install BNR systems.

The Department expects similar average unit capital costs for wastewater treatment upgrades to provide ammonia and nitrate removal for existing facilities in Arizona with flows of 100,000 gpd or more. Small BNR systems of less than 0.1 mgd are usually pre-engineered, factory or field-assembled package plant systems. The table below presents average BNR costs for new small systems (<100,000 gpd). The construction costs provided include all required facilities for a new package plant on a new site. Annual O&M costs include labor, electricity, maintenance and repair, solids handling and disposal, administration, laboratory analytical costs, and chemical costs.

Average BNR Costs for Small Systems: New Plants (2006 $)					
System	**4,000 gpd**	**10,000 gpd**	**25,000 gpd**	**50,000 gpd**	**100,000 gpd**
MLE Process					
Construction	$348,771	$415,585	$563,912	$803,108	$1,167,914
O&M	$37,263	$43,515	$60,553	$81,636	$122,699
4-Stage Bardenpho Process					
Construction	$448,992	$491,753	$634,736	$889,966	$1,293,524
O&M	$64,353	$70,604	$90,462	$117,551	$162,169
3-Stage Process					
Construction	$388,859	$444,983	$589,302	$837,851	$1,220,029
O&M	$44,005	$51,360	$69,133	$93,403	$142,066
SBR Process					
Construction	$448,992	$509,125	$644,090	$931,391	$1,290,852
O&M	$34,321	$41,799	$60,185	$82,862	$122,577

MLE and Deep Bed Filtration					
Construction	$411,576	$491,753	$649,435	$887,294	$1,280,161
O&M	$45,231	$52,340	$71,217	$93,036	$136,550
Submerged Biofilter Process					
Construction	$330,063	$395,541	$601,328	$1,131,834	NA
O&M	$23,902	$29,909	$50,379	$75,385	NA
RBC Process					
Construction	$351,443	$457,010	$704,222	$1,159,896	$1,459,224
O&M	$25,006	$31,747	$53,198	$75,385	$109,584

This table illustrates the potential costs associated with the installation of a new package wastewater treatment plant that can provide ammonia and nitrate removal. Capital costs for new package plants will vary depending on the treatment process installed and the size of the package plant. Construction costs range from approximately $350,000 for a 4,000 gpd package plant to $1.5 million for a 100,000 gpd package plant. Annual operation and maintenance costs range from $25,000/year for the smallest plant (4,000 gpd) to over $160,000/year for the largest package plant (100,000 gpd).

There are 36 EDWs currently identified in the rules that will be affected by the new numeric ammonia criteria for EDWs. This rulemaking adds 29 new EDWs. Most facilities discharging to these areas already provide biological nutrient removal treatment, including nitrification to transform ammonia to nitrate and denitrification to meet the current BADCT requirements for the APP permit program. As many as 30 wastewater treatment plants may be required, over a reasonable period of time, to retrofit their existing facility and upgrade unit treatment processes to meet numeric ammonia standards, if they choose to continue discharging to surface waters

C. Businesses Directly Affected By the Rulemaking

Businesses and industries (such as private wastewater utilities, mining operations, and electric utilities) that discharge pollutants to surface waters in Arizona may be directly affected by this rulemaking. Business that discharge pollutants to Arizona surface waters are regulated under the AZPDES permit program. Revisions to the surface water quality standards rules may result in changes in the permits that regulate their discharges.

D. Estimated Costs and Benefits to Private and Public Employment.

Private and public employment is not directly affected by these rules.

E. Estimated Costs and Benefits to Consumers and the Public.

It is relatively easy to *qualitatively* describe the benefits of clean water used as a source for drinking water, bathing, cooking, washing clothes, and the inherent value of Arizona's rivers and lakes that are safe for swimming, fishing, boating, wading, or other water-based recreation. The value of clean water for recreation and tourism, agricultural irrigation, real estate and manufacturing is understood and clearly provides economic benefit. However, it is more difficult to estimate or quantify these benefits in monetary terms. In one sense, since clean water is essential to life in the desert for humans and wildlife.

Consider what clean water means to the enjoyment of the Colorado River beaches, rafting and kayaking in the Grand Canyon or other Arizona rivers, houseboating on Lake Powell and boating on other major Arizona reservoirs, fishing in Arizona's streams and lakes, spring break at Lake Havasu, tubing on the lower Salt River. Water has a powerful attraction for people in our desert state, and that attraction translates into jobs and profits for the Arizona economy. The 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation survey for Arizona reported that there were 419,000 anglers who spent an average of 10 days fishing in Arizona in 2001 for an estimated total of 4,246,000 fishing days. The U.S. Fish and Wildlife Service estimated that total fishing trip-related and equipment expenditures by Arizona residents in 2001 was $336,293,000. Fishing trip and equipment expenditures by non-residents in Arizona was estimated to be another $48,205,000. The 2001 survey also reported that an additional 1.5 million people participated in wildlife-watching activities, such as bird-watching and wildlife photography. Arizona's riparian areas and wetlands provide critically important habitat for Arizona wildlife. The survey reports that Arizona residents and non-residents spent an estimated $1.6 billion on wildlife-related recreation in Arizona.

Clean water is critical to the maintenance and protection of aquatic life and wildlife. Clean water is an essential habitat component that clearly relates to these economically important recreational activities. As the example of the economic value of fishing in Arizona illustrates, the economic impact of clean water to support water-based recreation and tourism can be valued in the millions of dollars. Almost all Arizonans participate in some form of water-based recreation and tourism. When Arizonans decide to plan vacations and travel for pleasure, there is a strong tendency to

head to the water. It is difficult to quantify the value of clean water to these recreational experiences. However, we know at some basic level that without clean water, all of these experiences are diminished in value.

It is nearly impossible to quantify the value of maintaining and protecting clean water in the Colorado River that is transported through the Central Arizona Project (CAP). This 336 mile long canal provides on average 1.4 million acre-feet of water each year to nearly 2 million citizens and businesses in central and southern Arizona. The CAP and other surface water are absolutely essential to life in the Valley of the Sun and the Tucson metropolitan areas. If the quality of the water transported in the CAP canal were unfit for human consumption or for use in manufacturing or agriculture, the economic and social impact throughout the state would be catastrophic.

Clean water is an absolute necessity for ensuring agricultural productivity. The Department has adopted water quality standards to maintain and protect water quality for irrigation and livestock watering. An example of the economic importance of the agricultural sector in Arizona is to consider agricultural productivity in Maricopa County. The Arizona Department of Agriculture states on their web site that over 100,000 bales of cotton, 44,000 tons of durum wheat, 39,000 tons of barley, and 610,000 tons of alfalfa are produced in Maricopa County each year. In addition, Maricopa County is known for producing head lettuce, leaf lettuce, romaine, broccoli, cauliflower, onions, carrots, honeydew, cantaloupe, watermelon, potatoes, and cabbage. In addition, lemons, oranges, grapefruit, and tangerines make citrus a large contributor to agriculture. More than 245,000 cattle and calves as well as 12,000 sheep and lambs live inside Maricopa County. It is estimated that agriculture is worth $792,307,000 annually in Maricopa County alone. This agricultural productivity would not be possible without clean water that can be used for irrigation and livestock watering.

Lastly, clean water is important to real estate. As everyone who has ever bought a home knows, real estate values tend to be higher with a waterfront view. It a fact that the economic value of a waterfront location on a clean river or lake is significantly higher than a location on a polluted water body. Community and business leaders understand the potential value of waterfront locations. Rivers and lakes often become the focus of new residential and commercial development. Consider the example of the Tempe Town Lake. In less than ten years, Tempe Town Lake has become a community gathering place, ranked by the Phoenix Business Journal as Arizona's second most popular public attraction. Each year, more than 2.3 million people visit the lake for rowing, fishing, jogging and the more than 100 special events that take place at the lake. By creating Town Lake, the City of Tempe has reinvigorated its economy. Land surrounding Town Lake, once considered blighted, is some of Arizona's most desired real estate, with penthouse condominiums selling for more than $6 million. Tempe Town Lake alone brings approximately $60 million in tourism revenue to city businesses. Numerous public and private projects have been built or are under construction around the lake, including the Hayden Ferry Lakeside mixed use development, Tempe Beach Park and Splash Playground, Tempe Center for the Arts, Town Lake Marina, Playa del Norte development and the Indian Bend Wash habitat restoration. Good water that meets water quality standards is essential to maintaining and enhancing the economic and recreational values associated with this water body. Certainly, the economic value of Tempe Town Lake is significantly diminished if water quality is not adequate for water-based recreation or the maintenance of the aesthetic qualities of the lake. It is not unreasonable to estimate an economic value of a clean Tempe Town Lake (i.e., the value of existing and planned residential and commercial developments, tourism, recreation, etc.) at hundreds of millions of dollars.

Some business, industry, and consumers may have to pay higher utility bills for sewer services in communities where wastewater treatment plant upgrades are required to comply with new or revised water quality standards. In particular, customers served by wastewater treatment plants that discharge to effluent dependent waters may be affected by the adoption of numeric water quality standards that will limit discharges of ammonia but only if the discharge is not currently toxic. Wastewater treatment plant upgrades are typically financed through rate increases, bonding, or through low-interest Water Infrastructure Financing Authority loans.

Municipal operators of wastewater treatment plants typically pay the debt service on bonds or WIFA loans through increases in sewer rates and sewer connection fees for customers in the local community. It is difficult to estimate the costs to consumers and the general public. All that can be said with reasonable certainty is that the cost of sewer services will increase for those wastewater treatment plants that are required to upgrade treatment. To provide one example of how customers may be affected. the Nogales International Wastewater Treatment Plant projects a wastewater treatment rate increase from $6.75 to $9.96 for the base fee over a period of 10 years and an increase in the sewer rate from $1.17 to $1.71 for every 1,000 gallons over the same period.

Changes in this rulemaking also level the playing field between businesses and municipalities that are point source dischargers. Previously the rule required the Department to use of EDW standards when writing permits for discharges from "wastewater treatment plants" to an ephemeral water. This rulemaking clarifies that any discharge of "wastewater" to an ephemeral water will require use of EDW standards in the AZPDES permit. With this change, an industrial facility will be held to the same water quality requirements as the municipal discharger to the same waterbody.

Several of the methodologies for developing criteria have changed, for several of the designated uses, resulting in more protective standards. In deriving the fish consumption criteria, the Department has adopted EPA's recommendations that resulted in two changes: 1) increasing the default fish consumption number from 6.5 to 17.5 grams/day to more adequately protect the general population of fish consumer, and 2) changing the relative source contribution from 100 percent to 20 percent, thereby acknowledging there may be additional routes of exposure for a pollutant

besides ingestion of fish. Both of these changes result in the fish consumption standards that are more protective of human health. In deriving both full and partial body contact criteria for non-carcinogenic compounds, changing the relative source contribution from 100 percent exposure to 20 percent, also results in more protective standards. As with fish consumption, this change assumes that there are other possible avenues of exposure for a particular pollutant than just through full or partial body contact with the surface water. The Domestic Water Source designated use criteria is either the Maximum Contaminant Levels (MCLs) established by EPA or are values derived by EPA methods to protect human health. Once again, the Department used the new default of 20 percent relative source contribution which results in more protective standards.

Achieving water quality standards has substantial health benefits to the public. Nitrates above 10 milligrams per liter in drinking water can cause human health risks, especially to children younger than 5 years old, the elderly, and persons with suppressed or compromised immune systems. Infants who drink water with elevated nitrates may be at risk of methemoglobinemia, or "blue-baby" syndrome, which can cause development deficiencies or even death. In surface waters, excess nitrogen causes algal blooms that clog sections of rivers or blanket lakes. The algal blooms can be toxic to both humans and aquatic life. Symptoms in humans can range from severe gastrointestinal issues to minor skin irritations.

Another new standard adopted in this rulemaking is a fish tissue standard for methylmercury (MeHg), the organic form of mercury, which is one of the most toxic substances known. While it has been linked to a variety of health effects, the primary risk arises from its toxicity to the nervous system, including the brain. The primary route of human exposure to methylmercury is dietary, and unborn children are as much as 10 times more susceptible than adults to its detrimental effects. The most common source of exposure to MeHg is from eating fish that contain the mercury. Upon ingestion by humans, MeHg is readily absorbed through the gastrointestinal tract and easily penetrates the blood-brain and placental barriers. Most at risk are infants and unborn children whose mothers consume fish containing MeHg during pregnancy or while nursing. If the tissues of a pregnant or breastfeeding woman are contaminated with Hg, a disproportionate amount of that mercury may be passed to the baby, where it can attack the developing nervous system. Chronic exposure to MeHg at elevated concentrations can cause developmental delays and learning disabilities and acute exposures may cause gross cranial defects, cerebral palsy and a higher infant mortality rate. Adoption of the fish tissue standard is protective of human health and will aid the Department in notifying the public when it is not safe to consume fish from certain waterbodies.

F. Estimated Costs and Benefits to State Revenues.

There are no fees associated with these rules. This rulemaking will have no impact on state revenues.

Requirements of A.R.S. § 41-1035.

1. *Establish less stringent compliance and reporting requirements for small businesses.*
   The rules do not establish any reporting requirements.
2. *Establish less stringent compliance or reporting schedules or deadlines for small businesses.*
   The rules authorize schedules of compliance in A.A.C. R18-11-121. The Department is prohibited by federal law from establishing less stringent compliance schedules for small businesses under 40 CFR 122.47. The rules do not establish any reporting schedules or deadlines for small businesses.
3. *Consolidate or simplify the rule's compliance and reporting requirements for small businesses*.
   The rulemaking does not prescribe reporting requirements. There are no opportunities to consolidate or simplify compliance requirements for small businesses.
4. *Establish performance standards for small businesses to replace design and operational standards.*
   The rules do not establish design or operational standards for small businesses.
5. *Exempt small businesses from any or all requirements of the rule*.
   Water quality standards are provisions of state law required by the Clean Water Act. The Department cannot exempt small businesses from the requirement to comply with surface water quality standards established pursuant to the Act.

9. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:

Name: Shirley J. Conard

Address: Department of Environmental Quality
1110 W. Washington St., 5415A-1
Phoenix, AZ 85007

Telephone: (602) 771-4632 (Metro-Phoenix area) or
1-800-234-5677, 4632 (other areas)

Fax: (602) 771-4528

E-mail: conard.shirley@azdeq.gov

10. The time, place, and nature of the proceedings for the adoption, amendment, or repeal of the rule, or if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rule:

Date:	Tuesday, May 13, 2008
Time:	2:00 p.m.
Location:	Department of Environmental Quality 1110 W. Washington St., Conference Room 3175 Phoenix, AZ 85007
Nature:	Oral Proceeding

Date:	Monday, May 19, 2008
Time:	1:30 p.m.
Location:	Pima County Public Library 101 N. Stone Ave., Lower Level Conference Room Tucson, AZ
Nature:	Oral Proceeding

Written comments on the proposed rules or preliminary economic, small business, and consumer impact statement must be received by 5:00 p.m. Friday, May 30, 2008.

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting the Department's coordinator, Trisha Garland, at (602) 771-4794 (voice) or 1-800-367-3839 (TDD Relay). Requests should be made as early as possible to allow time to arrange the accommodation.

11. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

None

12. Incorporations by reference and their location in the rules:

R18-11-110(B)	"2005 Review, Water Quality Standards for Salinity, Colorado River System," Colorado River Basin Salinity Control Forum (October, 2005)
R18-11-112(D)(4)(b)	"Endangered and Threatened Wildlife," 50 CFR 17.11 (Revised 2005) "Endangered and Threatened Plants," 50 CFR 17.12 (Revised 2005)
R18-11-115(C)(1)	"The Recalculation Procedure," Appendix L, pages 90 - 98, Water Quality Standards Handbook, Second Edition, EPA 823-B-94-005b (August 1994)
R18-11-115(C)(2)	"Water-Effects Ratio for Metals," Appendix L, pages 1 - 89, Water Quality Standards Handbook, Second Edition, EPA 823-B-94-005b (August 1994)
R18-11-115(C)(3)	"Streamlined Water Effects Ratio Procedure for Discharges of Copper," EPA-822-R-01-005 (March 2001)

13. The full text of the rules follows:

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 11. DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY STANDARDS

ARTICLE 1. WATER QUALITY STANDARDS FOR SURFACE WATERS

Section
R18-11-101. Definitions
R18-11-102. Applicability
R18-11-107. Antidegradation
R18-11-107.01. Antidegradation Implementation Procedures
R18-11-108. Narrative Water Quality Standards
R18-11-108.01. Narrative Biological Standard Implementation Procedures
R18-11-108.02. Narrative Bottom Deposit Standard Implementation Procedures

R18-11-108.03. Narrative Nutrient Standard Implementation Procedures
R18-11-109. Numeric Water Quality Standards
R18-11-110. Salinity Standards for the Colorado River
R18-11-111. Analytical Methods
R18-11-112. ~~Unique~~ Outstanding Arizona Waters
R18-11-113. ~~Effluent-dependent~~ Effluent-Dependent Waters
R18-11-114. Mixing Zones
R18-11-115. ~~Repealed~~ Site-Specific Standards
R18-11-116. Resource ~~management agencies~~ Management Agencies
R18-11-117. Canals and Municipal Park Lakes
R18-11-118. Dams and Flood Control Structures
R18-11-121. Schedules of Compliance
R18-11-122. Variances
R18-11-123. ~~Prohibition Against~~ Discharge Prohibitions
Appendix A. Numeric Water Quality ~~Criteria~~ Standards
~~Table 1. Human Health and Agricultural Designated Uses~~
~~Table 2. Aquatic & Wildlife Designated Uses~~
~~Table 3. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife ephemeral~~
~~Table 4. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater, warmwater, and edw~~
~~Table 5. Chronic Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater, warmwater, and edw~~
Table 1. Water Quality Criteria By Designated Use
Table 2. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater
Table 3. Chronic Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater
Table 4. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife warmwater, and edw
Table 5. Chronic Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife warmwater and edw
Table 6. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife ephemeral
Table 7. Acute Water Quality Standards for ~~dissolved~~ Dissolved Chromium III Aquatic and Wildlife coldwater, warmwater, and edw
Table 8. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Chromium III Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 6.~~Table 9. Acute Water Quality Standards for ~~dissolved~~ Dissolved Chromium III Aquatic and Wildlife ephemeral
~~Table 11.~~Table 10. Acute Water Quality Standards for ~~dissolved~~ Dissolved Copper Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 9.~~Table 11. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Copper Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 10.~~Table 12. Acute Water Quality Standards for ~~dissolved~~ Dissolved Copper Aquatic and Wildlife ephemeral
~~Table 14.~~Table 13. Acute Water Quality Standards for ~~dissolved~~ Dissolved Lead Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 15.~~Table 14. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Lead Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 13.~~Table 15. Acute Water Quality Standards for ~~dissolved~~ Dissolved Lead Aquatic and Wildlife ephemeral
Table 16. Acute Water Quality Standards for ~~dissolved~~ Dissolved Nickel Aquatic and Wildlife coldwater, warmwater, and edw
Table 17. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Nickel Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 18. Water Quality Standards for Dissolved Silver Aquatic and Wildlife coldwater, warmwater, edw, and ephemeral~~
~~Table 12.~~Table 18. Acute Water Quality Standards for ~~dissolved~~ Dissolved Nickel Aquatic and Wildlife ephemeral
Table 19. Water Quality Standards for Dissolved Silver Aquatic and Wildlife coldwater, warmwater, edw, and ephemeral
Table 20. Acute and Chronic Water Quality Standards for ~~dissolved~~ Dissolved Zinc Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 19.~~Table 21. Acute Water Quality Standards for ~~dissolved~~ Dissolved Zinc Aquatic and Wildlife ephemeral
~~Table 21.~~Table 22. Acute Water Quality Standards for Pentachlorophenol ~~Acute~~ Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 22.~~Table 23. Chronic Water Quality Standards for Pentachlorophenol ~~Chronic~~ Aquatic and Wildlife coldwater, warmwater, and edw
~~Table 23.~~ Table 24. Acute Water Quality Standards for Pentachlorophenol ~~Acute~~ Aquatic and Wildlife ephemeral
~~Table 24.~~Table 25. Acute Criteria for Total Ammonia (in mg/L as N) Aquatic and Wildlife coldwater, warmwater, and edw

~~Table 25.~~Table 26. Chronic Criteria for Total Ammonia (in mg/L as N) ~~A&Wc, A&Ww~~ Aquatic and Wildlife coldwater, warmwater, and edw
Appendix B. ~~List of~~ Surface Waters and Designated Uses
Appendix C. ~~Repealed~~ Site-Specific Standards

ARTICLE 1. WATER QUALITY STANDARDS FOR SURFACE WATERS

R18-11-101. Definitions

The following terms ~~of~~ apply to this Article ~~have the following meanings~~:

1. "Acute toxicity" means toxicity involving a stimulus severe enough to induce a rapid response ~~rapidly~~. In aquatic toxicity tests, an effect observed in 96 hours or less is considered acute.
~~2. "AgI" means agricultural irrigation.~~
~~3. "AgL" means agricultural livestock watering.~~
~~4.~~2. "Agricultural irrigation (AgI)" means the use of a surface water for ~~the irrigation of crops~~ crop irrigation.
~~5.~~3. "Agricultural livestock watering (AgL)" means the use of a surface water as a ~~supply of~~ water supply for consumption by livestock.
~~6.~~4. "Annual mean" ~~means~~ is the arithmetic mean of monthly values determined over a consecutive 12-month period, provided that monthly values are determined for at least three months. ~~The~~ A monthly value is the arithmetic mean of all values determined in a calendar month.
~~7.~~5. "Aquatic and wildlife (cold water) (A&Wc)" means the use of a surface water by ~~animals, plants, or other cold-water organisms~~ an animal, plant, or other organism, generally occurring at ~~elevations~~ an elevation greater than 5000 feet, for habitation, growth, or propagation.
~~8.~~6. "Aquatic and wildlife (effluent-dependent water) (A&Wedw)" means the use of an effluent-dependent water by ~~animals, plants, or other organisms~~ an animal, plant, or other organism for habitation, growth, or propagation.
~~9.~~7. "Aquatic and wildlife (ephemeral) (A&We)" means the use of an ephemeral water by ~~animals, plants, or other organisms~~ an animal, plant, or other organism, excluding fish, for habitation, growth, or propagation.
~~10.~~8. "Aquatic and wildlife (warm water) (A&Ww)" means the use of a surface water by ~~animals, plants, or other warm-water organisms~~ an animal, plant, or other organism, generally occurring at ~~elevations~~ an elevation less than 5000 feet, for habitation, growth, or propagation.
~~11. "A&Wc" means aquatic and wildlife (cold water).~~
~~12. "A&We" means aquatic and wildlife (ephemeral).~~
~~13. "A&Wedw" means aquatic and wildlife (effluent-dependent water).~~
~~14. "A&Ww" means aquatic and wildlife (warm water).~~
9. "Arizona Pollutant Discharge Elimination System (AZPDES)" means the point source discharge permitting program established under 18 A.A.C. 9, Article 9.
10. "Assimilative capacity" means the difference between the baseline water quality concentration for a pollutant and the most stringent applicable water quality criterion for that pollutant.
~~15.~~11. "Clean Water Act" means the Federal Water Pollution Control Act [33 U.S.C. 1251 to 1387].
~~16.~~12. "Criteria" means elements of water quality standards that are expressed as pollutant concentrations, levels, or narrative statements representing a water quality that supports a designated use.
13. "Critical flow condition" means the lowest flow over seven consecutive days that has a probability of occurring once in 10 years (7 Q 10).
14. "Deep lake" means a lake or reservoir with an average depth over 6 meters.
~~17.~~15. "Designated use" means ~~a~~ the use of a surface water specified in Appendix B of this Article ~~for a surface water~~.
~~18.~~16. "Domestic water source (DWS)" means the use of a surface water as a source of potable water ~~supply~~. ~~Coagulation, sedimentation, filtration, disinfection, or other treatments~~ Treatment of a surface water may be necessary to yield a finished water suitable for human consumption.
~~19. "DWS" means domestic water source.~~
~~20. "EDW" means effluent-dependent water.~~
~~21.~~17. "Effluent-dependent water (EDW)" means a surface water, classified under R18-11-113, that consists of a point source ~~discharges~~ discharge of ~~treated~~ wastewater ~~that is classified as an effluent-dependent water by the Director under R18-11-113~~. An effluent-dependent water is a surface water that, without the point source discharge of ~~treated~~ wastewater, would be an ephemeral water.
~~22.~~18. "Ephemeral water" means a surface water that has a channel that is at all times above the water table~~,~~ and ~~that~~ flows only in direct response to precipitation.
~~23.~~19. "Existing use" means ~~those uses actually~~ a use attained in the waterbody on or after November 28, 1975, whether or not ~~they are~~ it is included in the water quality standards.
~~24. "FBC" means full-body contact."~~
~~25. "FC" means fish consumption.~~

~~26.~~20. "Fish consumption (FC)" means the use of a surface water by humans for ~~harvesting aquatic organisms for consumption~~ fishing and eating the fish that are caught. ~~Harvestable aquatic organisms include, but are not limited to, fish, clams, turtles, crayfish, and frogs.~~

~~27.~~21. "Full-body contact (FBC)" means the use of a surface water for swimming or other recreational activity that causes the human body to come into direct contact with the water to the point of complete submergence. The use is such that ingestion of the water is likely and sensitive body organs, such as the eyes, ears, or nose, may be exposed to direct contact with the water.

~~28.~~22. "Geometric mean" means the nth root of the product of n items or values. The geometric mean is calculated using the following formula:

$$GM_y = \sqrt[n]{(Y_1)(Y_2)(Y_3)...(Y_n)}$$

~~29.~~23. "Hardness" means the sum of the calcium and magnesium concentrations, expressed as calcium carbonate ($CaCO_3$) in milligrams per liter.

24. "Igneous lake" means a lake located in volcanic or basaltic geology and soils.

~~30.~~25. "Intermittent ~~surface~~ water" means a stream or reach ~~of a stream~~ that flows continuously only at certain times of the year, as when it receives water from a spring or from another surface source, such as melting snow.

~~31.~~26. "Mixing zone" means ~~a prescribed~~ an area or volume of a surface water that is contiguous to a point source discharge where ~~initial~~ dilution of the discharge takes place.

~~32. "National Pollutant Discharge Elimination System means the point source discharge permit program established by § 402 of the Clean Water Act [33 U.S.C. 1342].~~

~~33. "Ninetieth percentile" means the value that may not be exceeded by more than 10% of the observations in a consecutive 12 month period. A minimum of 10 samples, each taken at least 10 days apart, are required to determine a ninetieth percentile.~~

~~34. "NNS" means no numeric standard.~~

~~35.~~27. "Oil" means petroleum in any form, including ~~but not limited to~~ crude oil, gasoline, fuel oil, diesel oil, lubricating oil, or sludge.

28. "Outstanding Arizona water (OAW)" means a perennial or intermittent water that is free-flowing, has good water quality, and has one or more of the following characteristics:
   a. The water is of exceptional recreational or ecological significance,
   b. The existing water quality is essential to the maintenance and propagation of a threatened or endangered species, or
   c. The water provides critical habitat for a threatened or endangered species.

~~36.~~29. "Partial-body contact (PBC)" means the recreational use of a surface water that may cause the human body to come into direct contact with the water, but normally not to the point of complete submergence (for example, wading or boating). The use is such that ingestion of the water is not likely and sensitive body organs, such as the eyes, ears, or nose, will not normally be exposed to direct contact with the water.

~~37. "PBC" means partial-body contact."~~

~~38.~~30. "Perennial ~~surface~~ water" means a surface water that flows continuously throughout the year.

~~39.~~31. "Pollutant" means ~~fluids, contaminants, toxic wastes, toxic pollutants,~~ a fluid, contaminant, toxic waste, toxic pollutant, dredged spoil, solid waste, ~~substances and chemicals, pesticides, herbicides, fertilizers and other agricultural chemicals~~ pesticide, herbicide, fertilizer and other agricultural chemical, incinerator residue, sewage, garbage, sewage sludge, ~~munitions, petroleum products, chemical wastes, biological materials, radioactive materials~~ munition, petroleum product, chemical waste, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and mining, industrial, municipal, and agricultural ~~wastes~~ waste, or any other liquid, solid, gaseous, or hazardous substance.

~~40.~~32. "Practical quantitation limit" means the lowest level of quantitative measurement that can be reliably achieved during a routine laboratory ~~operations~~ operation.

~~41. "Recreational uses" means the full-body contact and partial-body contact designated uses.~~

33. "Reference condition" means a set of ecological measurements from a population of relatively undisturbed waterbodies within a region that establish a basis for making comparisons of biological condition among samples.

~~42.~~34. "Regional Administrator" means the Regional Administrator of Region IX of the U.S. Environmental Protection Agency.

35. "Regulated discharge" means a point source discharge regulated under an AZPDES permit, a discharge regulated by a § 404 permit, and any discharge authorized by a federal permit or license that is subject to state water quality certification under § 401 of the Clean Water Act.

36. "Riffle habitat" means a stream segment where moderate water velocity and substrate roughness produce moderately turbulent conditions that break the surface tension of the water and may produce breaking wavelets that turn the surface water into white water.

37. "Run habitat" means a stream segment where there is moderate water velocity that does not break the surface tension of the water and does not produce breaking wavelets that turn the surface water into white water.
38. "Sedimentary lake" means a lake or reservoir in sedimentary or karst geology and soils.
39. "Shallow lake" means a lake or reservoir, excluding an urban lake, with a smaller, flatter morphology and an average depth of less than 3 meters and a maximum depth of less than 4 meters.
40. "Significant degradation" means:
    a. The consumption of 20 percent or more of the available assimilative capacity for a pollutant of concern at critical flow conditions, or
    b. Any consumption of assimilative capacity beyond the cumulative cap of 50 percent of assimilative capacity.

~~43.~~41. "Surface water" means a water of the United States and includes the following:
    a. A water that is currently used, was used in the past, or may be susceptible to use in interstate or foreign commerce;
    b. An interstate water, including an interstate wetland;
    c. All other waters, such as an intrastate lake, reservoir, natural pond, river, stream (including an intermittent or ephemeral stream), creek, wash, draw, mudflat, sandflat, wetland, slough, backwater, prairie pothole, wet meadow, or playa lake, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including any such water:
        i. That is or could be used by interstate or foreign travelers for recreational or other purposes;
        ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
        iii. That is used or could be used for industrial purposes by industries in interstate or foreign commerce;
    d. An impoundment of a surface water as defined by this definition;
    e. A tributary of a surface water identified in subsections ~~(a)~~ (41)(a) through (d) ~~of this definition~~; and
    f. A wetland adjacent to a surface water identified in subsections ~~(a)~~ (41)(a) through (e) ~~of this definition~~.

~~44.~~42. "Total nitrogen" means the sum of the concentrations of ammonia (NH_3), ammonium ion (NH_4+), nitrite (NO_2), and nitrate (NO_3), and dissolved and particulate organic nitrogen expressed as elemental nitrogen.

~~45.~~43. "Total phosphorus" means all of the phosphorus present in a sample, regardless of form, as measured by a persulfate digestion procedure.

~~46.~~44. "Toxic" means a pollutant or combination of pollutants, that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism, either directly from the environment or indirectly by ingestion through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations in the organism or its offspring.

~~47. "Unique water" means a surface water that is classified as an outstanding state resource water by the Director under R18-11-112.~~

45. "Urban lake" means a small, manmade lake within an urban landscape.

~~48.~~46. "Use attainability analysis" means a structured scientific assessment of the factors affecting the attainment of a designated use including physical, chemical, biological, and economic factors.

47. "Wadeable stream" means a stream where the product of the water depth in feet multiplied by the velocity of the water in feet per second is less than nine.

~~49.~~48. "Wetland" means an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. A wetland includes a swamp, marsh, bog, cienega, tinaja, and similar areas.

~~50.~~49. "Zone of passage" means a continuous water route of volume, cross-sectional area, and quality necessary to allow passage of free-swimming or drifting organisms with no acutely toxic effect produced on the organisms.

R18-11-102. Applicability

A. The water quality standards prescribed in this Article apply to surface waters.

B. The water quality standards prescribed in this Article do not apply to the following:
1. A waste treatment system, including an impoundment, pond, lagoon, or constructed wetland that is a part of the waste treatment system~~.~~;
2. A man-made surface impoundment and associated ditches and conveyances used in the extraction, beneficiation, or processing of metallic ores that is not a surface water or is located in an area that once was a surface water but no longer remains a surface water because it has been and remains legally converted, including:
    a. ~~a~~ A pit,
    b. ~~pregnant~~ Pregnant leach solution pond,
    c. ~~raffinate~~ Raffinate pond,
    d. ~~tailing~~ Tailing impoundment,
    e. ~~decant~~ Decant pond,
    f. ~~pond~~ Pond or a sump in a mine pit associated with dewatering activity,
    g. ~~pond~~ Pond holding water that has come into contact with a process or product and that is being held for recy-

cling,
h. ~~spill~~ Spill or upset catchment pond, or
i. A pond used for onsite remediation~~, that is not a surface water or is located in an area that once was a surface water but no longer remains a surface water because it has been and remains legally converted.~~;
3. A man-made cooling pond that is neither created originally in a surface water nor results from the impoundment of a surface water; or
4. A surface water located on tribal lands.

R18-11-107. Antidegradation

A. The Director shall, using R18-11-107.01 and this Section, determine whether there is degradation of water quality in a surface water on a pollutant-by-pollutant basis.

B. Tier 1: The level of water quality necessary to ~~protect~~ support an existing ~~uses~~ use shall be maintained and protected. No degradation of existing water quality is permitted in a surface water where the existing water quality does not meet the applicable water quality standards.

C. Tier 2: Where existing water quality in a surface water is better than the applicable water quality standard~~,~~ the existing water quality shall be maintained and protected. The Director may allow ~~limited~~ degradation of existing water quality in the surface water, provided ~~that the Department holds a public hearing on whether degradation should be allowed under the general public hearing procedures prescribed at R18-1-401 and R18-1-402 and~~ the Director makes all of the following findings:
1. The ~~level of~~ water quality necessary ~~to protect~~ for existing uses is fully protected~~. Water~~ and water quality ~~shall~~ is not ~~be~~ lowered to a level that does not comply with applicable water quality standards~~.~~,
2. The highest statutory and regulatory requirements for new and existing point sources are achieved~~.~~,
3. All cost-effective and reasonable best management practices for nonpoint source pollution control are implemented~~.~~, and
4. Allowing lower water quality is necessary to accommodate important economic or social development in the area where the surface water is located.

D. Tier 3: Existing water quality shall be maintained and protected in a surface water that is classified as ~~a unique water~~ an OAW under R18-11-112. ~~The Director shall not allow limited degradation~~ Degradation of ~~a unique water~~ an OAW under subsection (C) is prohibited.

E. The ~~Department~~ Director shall implement this Section in a manner consistent with § 316 of the Clean Water Act [33 U.S.C. ~~§~~ 1326] if a potential water quality impairment associated with a thermal discharge is involved.

R18-11-107.01. Antidegradation Implementation Procedures

A. Tier 1 antidegradation protection.
1. Tier 1 antidegradation protection applies to the following surface waters:
   a. A surface water listed on the § 303(d) list for the pollutant that resulted in the listing,
   b. An effluent dependent water,
   c. An ephemeral water,
   d. An intermittent water, and
   e. A canal.
2. A regulated discharge shall not cause a violation of a surface water quality standard or a wasteload allocation established in a total maximum daily load under 11 A.A.C. 6.
3. Tier 1 antidegradation review requirements are satisfied for a point source discharge regulated under an AZPDES permit to an ephemeral water, effluent dependent water, intermittent water, or a canal provided water quality-based effluent limitations designed to achieve compliance with applicable surface water quality standards are established in the permit and technology-based requirements of the Clean Water Act for the point source discharge are met.

B. Tier 2 antidegradation protection.
1. Tier 2 antidegradation protection applies to a perennial water with existing water quality that is better than applicable water quality standards. A perennial water that is not listed in subsection (A)(1) nor classified as an OAW under A.A.C. R18-9-112(G) has Tier 2 antidegradation protection for all pollutants of concern.
2. A regulated discharge that meets the following criteria does not cause significant degradation:
   a. The regulated discharge consumes less than 20 percent of the available assimilative capacity for each pollutant of concern, and
   b. At least 50 percent of the assimilative capacity for each pollutant of concern remains available in the surface water for each pollutant of concern.
3. Antidegradation review. Any person proposing a regulated discharge that causes significant degradation shall provide the Department with the following information:

a. Alternative analysis. The person shall demonstrate that there are no reasonable, cost-effective, less-degrading, or non-degrading alternatives to the regulated discharge.
   i. The person seeking authorization for the discharge shall prepare and submit a written analysis of alternatives to the discharge. The analysis shall provide information on all reasonable, cost-effective, less-degrading, or non-degrading discharge alternatives. Alternatives may include wastewater treatment process changes or upgrades, pollution prevention measures, source reduction, water reclamation, alternative discharge locations, groundwater recharge, land application or treatment, local pretreatment programs, improved operation and maintenance of existing systems, seasonal or controlled discharge to avoid critical flow conditions, and zero discharge;
   ii. The alternatives analysis shall include cost information on base pollution control measures associated with the regulated discharge and cost information for each alternative;
   iii. The person shall implement the alternative that is cost effective and reasonable, results in the least degradation, and is approved by the Director. An alternative is cost effective and reasonable if treatment costs associated with the alternative are less than a 10 percent increase above the cost of base pollution control measures;
   iv. For purposes of this subsection, "base pollution control measures" are water pollution control measures required to meet technology-based requirements of the Clean Water Act and water quality-based effluent limits designed to achieve compliance with applicable water quality standards;
b. Social and economic justification. A person shall demonstrate to the Director that significant degradation is necessary to accommodate important economic or social development in the local area. The person seeking authorization for the discharge shall prepare a written social and economic justification that includes a description of the following:
   i. The geographic area where significant degradation of existing water quality will occur;
   ii. The current baseline social and economic conditions in the local area;
   iii. The net positive social and economic effects of development associated with the regulated discharge and allowing significant degradation;
   iv. The negative social, environmental and economic effects of allowing significant degradation of existing water quality; and
   v. Alternatives to the regulated discharge that do not significantly degrade water quality yet may yield comparable social and economic benefits;
c. Baseline characterization. A person seeking authorization to discharge to a perennial water shall provide baseline water quality data on pollutants of concern where no data exist or there are insufficient data to characterize baseline water quality and to determine available assimilative capacity. A discharger shall characterize baseline water quality at a location upstream of the proposed discharge location; and

4. Public participation. The Director shall provide public notice and an opportunity to comment on an antidegradation review, under subsection (B)(3) and shall provide an opportunity for a public hearing under A.A.C. R18-9-A908(B).

C. Tier 3 antidegradation protection.
1. Tier 3 antidegradation protection applies only to an OAW listed in R18-11-112(G) and to a surface water that is a direct tributary to an OAW.
2. A new or expanded point source discharge directly to an OAW is prohibited.
3. A person seeking authorization for a regulated discharge to a direct tributary to, or upstream of, an OAW shall demonstrate in a permit application or in other documentation submitted to the Department that the regulated discharge will not degrade existing water quality in the downstream OAW.
4. A discharge regulated under a § 404 permit that may affect existing water quality of an OAW requires an individual § 401 water quality certification to ensure that existing water quality is maintained and protected and any water quality impacts are temporary. Temporary water quality impacts are those impacts that occur for a period of six months or less.

D. Antidegradation review of a § 404 permit. The Department shall conduct an antidegradation review of a discharge authorized by a § 404 permit issued by the U.S. Army Corps of Engineers as part of the § 401 water quality certification process.
1. A regulated discharge authorized by a § 404 permit that receives § 401 water quality certification from the Department satisfies antidegradation requirements.
2. A discharge regulated under a nationwide or regional § 404 permit that has been certified by the Director under § 401 of the Clean Water Act does not require an individual antidegradation review except as required under subsection (C)(4).

E. Antidegradation review of an AZPDES stormwater permit. An individual stormwater permit for a municipal separate storm sewer system (MS4) meets antidegradation requirements if the permittee complies with the permit, including developing a stormwater management plan containing controls that reduce the level of pollutants in stormwater discharges to the maximum extent practicable and conducting monitoring activities of discharge water quality.

F. Antidegradation review of a general permit. The Director shall conduct the antidegradation review of a regulated discharge authorized by a general permit at the time the general permit is issued or renewed. A person seeking authorization to discharge under a general permit is not required to undergo an individual antidegradation review at the time the Notice of Intent is submitted unless the discharge may affect an OAW or a water listed on the § 303(d) list of impaired waters.

R18-11-108. Narrative Water Quality Standards

A. A surface water shall ~~be free from~~ not contain pollutants in amounts or combinations that:
1. Settle to form bottom deposits that inhibit or prohibit the habitation, growth, or propagation of aquatic life;
2. Cause objectionable odor in the area in which the surface water is located;
3. Cause off-taste or odor in drinking water;
4. Cause off-flavor in aquatic organisms;
5. Are toxic to humans, animals, plants, or other organisms;
6. Cause the growth of algae or aquatic plants that inhibit or prohibit the habitation, growth, or propagation of other aquatic life or that impair recreational uses;
7. Cause or contribute to a violation of an aquifer water quality standard prescribed in R18-11-405 or R18-11-406; or
8. Change the color of the surface water from natural background levels of color.

B. A surface water shall ~~be free from~~ not contain oil, grease, ~~and~~ or other ~~pollutants~~ pollutant that ~~float~~ floats as debris, foam, or scum; or that ~~cause~~ causes a film or iridescent appearance on the surface of the water; or that cause a deposit on a shoreline, bank, or aquatic vegetation. The discharge of lubricating oil or gasoline associated with the normal operation of a recreational watercraft is not a violation of this narrative standard.

C. ~~A discharge of suspended solids to a surface water shall not be~~ A surface water shall not contain a discharge of suspended solids in quantities or concentrations that ~~either~~ interfere with the treatment processes at the nearest downstream potable water treatment plant or substantially increase the cost of handling solids produced at the nearest downstream potable water treatment plant.

D. A surface water shall not contain refuse, rubbish, demolition or construction debris, trash, garbage, motor vehicles, appliances, tires, or other solid waste into a surface water or onto its banks.

E. A wadeable, perennial stream shall support and maintain a community of organisms having taxa richness, species composition, tolerance, and functional organization comparable to that of a reference stream in Arizona.

R18-11-108.01. Narrative Biological Standard Implementation Procedures

A. The narrative biological standard implementation procedures in this Section apply to a wadeable, perennial stream with either an aquatic and wildlife (cold water) or an aquatic and wildlife (warm water) designated use.

B. The biological standard in R18-11-108(E) is met when a bioassessment result, as measured by the Arizona Index of Biological Integrity (IBI) for cold or warm water is:
1. Greater than or equal to the 25th percentile of reference condition, or
2. Greater than the 10th percentile of reference condition and less than the 25th percentile of reference condition and a verification bioassessment result is greater than or equal to the 25th percentile of reference condition.

C. Arizona Index of Biological Integrity (IBI) scores.

Bioassessment Result	Index of Biological Integrity Scores	
	A&Wc	A&Ww
Greater than or equal to the 25th percentile of reference condition	≥52	≥50
Greater than the 10th and less than the 25th percentile of reference condition	46 - 51	40 - 49

R18-11-108.02. Narrative Bottom Deposit Standard Implementation Procedures

A. The narrative bottom deposit implementation procedures in this Section apply to wadeable, perennial streams with an aquatic and wildlife (cold water) or an aquatic and wildlife (warm water) designated use.

B. The narrative water quality standard for bottom deposits at R18-11-108(A)(1) is met when:
1. The percentage of fine sediments in the riffle habitats of a wadeable, perennial stream with an A&Wc designated use, as determined by a riffle pebble count, is less than or equal to 30 percent.
2. The percentage of fine sediments in the riffle and run habitats of a wadeable, perennial stream with an A&Ww designated use, as determined by a reach level pebble count, is equal to or less than 50 percent.

R18-11-108.03. Narrative Nutrient Standard Implementation Procedures

A. The narrative nutrient implementation procedures in this Section apply to those lakes and reservoirs categorized in Appendix B.

B. The narrative water quality standard for nutrients at R18-11-108(A)(6) is met if sampling conducted during the peak season for lake productivity shows:
1. The mean chlorophyll-*a* concentration is less than the lower value in the target range chlorophyll-*a* for the lake category; or

2. The mean chlorophyll-*a* concentration is within the target range for the lake category and:
   a. The mean blue green algae count is at or below 20,000 per milliliter, and
   b. The blue green algae count is less than 50 percent of the total algae count, and
   c. There is no evidence of nutrient-related impairments such as:
      i. An exceedance of dissolved oxygen or pH standards;
      ii. A fish kill coincident with a dissolved oxygen or pH exceedance;
      iii. A fish kill or other aquatic organism mortality coincident with algal toxicity;
      iv. Secchi depth is less than the lower value prescribed for the lake category;
      v. A nuisance algal bloom is present in the lacustrine portion of the lake or reservoir; or
      vi. The concentration of total phosphorous, total nitrogen, or total Kjehdal nitrogen (TKN) is greater than the upper value in the range prescribed for the lake category; or
3. Submerged aquatic vegetation covers 50 percent or less of the lake bottom of a shallow lake and there is less than a 5 mg/L swing in diel dissolved oxygen concentration measured within the photic zone.

C. The following threshold ranges apply during the peak season for lake productivity:
1. Warm water lakes peak season, April – October;
2. Cold water lakes peak season, May – September.

D. The following table lists the numeric targets for lakes and reservoirs.

NUMERIC TARGETS FOR LAKES AND RESERVOIRS

Designated Use	Lake Category	Chl-*a* (µg/L)	Secchi Depth (m)	Total Phosphorus (µg/L)	Total Nitrogen (mg/L)	Total Kjehldal Nitrogen (TKN) (mg/L)	Blue-Green Algae (per ml)	Blue-Green Algae (% of total count)	Dis-solved Oxygen (mg/L)	pH (SU)
FBC	Deep	10-15	1.5-2.5	70-90	1.2-1.4	1.0-1.1	20,000			6.5-9.0
	Shallow	10-15	1.5-2.0	70-90	1.2-1.4	1.0-1.1				
	Igneous	20-30	0.5-1.0	100-125	1.5-1.7	1.2-1.4				
	Sedimentary	20-30	1.5-2.0	100-125	1.5-1.7	1.2-1.4				
	Urban	20-30	0.5-1.0	100-125	1.5-1.7	1.2-1.4				
A&Wc	All	5-15	1.5-2.0	50-90	1.0-1.4	0.7-1.1		<50	7 (top m)	6.5-9.0
A&Ww	All (except urban lakes)	25-40	0.8-1.0	115-140	1.6-1.8	1.3-1.6			6 (top m)	
	Urban	30-50	0.7-1.0	125-160	1.7-1.9	1.4-1.7			6 (top m)	
A&Wedw	All	30-50	0.7-1.0	125-165	1.7-1.9	1.4-1.7				6.5-6.0
DWS	All	10-20	0.5-1.5	70-100	1.2-1.5	1.0-1.2	20,000			5.0-9.0

R18-11-109. Numeric Water Quality Standards

A. *E. coli* bacteria. The following water quality standards for ~~Escherichia coli (E. coli)~~ *Escherichia coli (E. coli)*~~,~~ are expressed in colony forming units per 100 milliliters of water (cfu / 100 ml)~~,~~ or as a Most Probable Number (MPN): ~~shall not be exceeded~~

~~**E. coli**~~ ***E. coli***	**FBC**	**PBC**
Geometric mean (~~four-sample~~ minimum of four samples in 30 days)	126	126
Single sample maximum	235	~~576~~ 575

B. pH. The following water quality standards for pH~~,~~ are expressed in standard units~~, shall not be violated~~:

pH	**DWS**	**FBC, PBC, A&W** [1]	**AgI**	**AgL**
Maximum	9.0	9.0	9.0	9.0
Minimum	5.0	6.5	4.5	6.5
~~Maximum change due to discharge~~	~~NNS~~	~~0.5~~	~~NNS~~	~~NNS~~

C. The ~~following~~ maximum allowable increase in ambient water temperature, ~~expressed in degrees Celsius, shall not be exceeded~~ due to a thermal discharge is as follows:

~~**Temperature**~~	~~**A&Ww, A&Wedw**~~	~~**A&We**~~
~~Maximum increase due to a thermal discharge~~ ~~2,3~~	~~3.0~~	~~1.0~~
A&Ww	**A&Wedw**	**A&Wc**
3.0° C	3.0° C	1.0° C

~~**D.**~~**C.** Suspended sediment concentration.

1. The following water quality ~~standard~~ standards for suspended sediment concentration, expressed in milligrams per liter (mg/L), are expressed as a ~~geometric mean~~ median value ~~(four-sample minimum)~~ determined from a minimum of four-samples collected at least seven days apart ~~shall not be exceeded~~. ~~The standard applies to a surface water that is at or near base flow and does not apply to a surface water during or soon after a precipitation event:~~

~~A&Wc, A&Ww~~	
~~80 mg / L~~	
A&Wc	**A&Ww**
25	80

2. The Director shall not use the results of a suspended sediment concentration sample collected during or within 48 hours after a local storm event to determine the median value.

~~**E.**~~**D.** Dissolved oxygen. The following ~~are the~~ water quality standards for dissolved oxygen~~,~~ are expressed in milligrams per liter (mg/L). ~~The dissolved oxygen concentration in a surface water shall not fall below the following minimum concentrations:~~

1. **Dissolved oxygen** **A&Ww** **A&Wc**
   Single sample minimum ~~4~~ 2 6.0 7.0
2. **Dissolved oxygenin effluent-dependent waters (single sample minimum)~~:~~** **A&W edw**
   Three hours after sunrise to sunset 3.0
   Sunset to three hours after sunrise 1.0
3. A surface water ~~is in compliance~~ complies with the water quality standard for dissolved oxygen if the percent saturation of dissolved oxygen is equal to or greater than 90~~%~~ percent.

~~**F.**~~**E.** Nutrient criteria. The following water quality standards for total phosphorus and total nitrogen~~,~~ are expressed in milligrams per liter (mg/L)~~, shall not be exceeded:~~. A minimum of 10 samples, each taken at least 10 days apart in a consecutive 12-month period, are required to determine a 90th percentile. Not more than 10 percent of the samples may exceed the 90th percentile value listed below:

		~~**Annual Mean**~~	~~**90th percentile**~~	~~**Single Sample Maximum**~~
~~1. Verde River and its tributaries from headwaters to Bartlett Lake:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~0.10~~ ~~1.00~~	~~0.30~~ ~~1.50~~	~~1.00~~ ~~3.00~~
~~2. Black River, Tonto Creek, and their tributaries that are not located on tribal lands:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~0.10~~ ~~0.50~~	~~0.20~~ ~~1.00~~	~~0.80~~ ~~2.00~~
~~3. Salt River and its tributaries that are not located on tribal lands but not Pinal Creek above Theodore Roosevelt Lake:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~0.12~~ ~~0.60~~	~~0.30~~ ~~1.20~~	~~1.00~~ ~~2.00~~
~~4. Theodore Roosevelt, Apache, Canyon, and Saguaro Lakes:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~0.03 5~~ ~~0.30 5~~	~~NNS~~ ~~NNS~~	~~0.60 6~~ ~~1.00 6~~
~~5. Salt River below Stewart Mountain Dam to confluence with the Verde River:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~0.05~~ ~~0.60~~	~~NNS~~ ~~NNS~~	~~0.20~~ ~~3.00~~
~~6. Little Colorado River and its tributaries above River Reservoir in Greer, South Fork of Little Colorado River above South Fork Campground, Water Canyon Creek above Apache-Sitgreaves National Forest boundary:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~0.08~~ ~~0.60~~	~~0.10~~ ~~0.75~~	~~0.75~~ ~~1.10~~
~~7. Little Colorado River at the crossing of Apache County Road No. 124:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~NNS~~ ~~NNS~~	~~NNS~~ ~~NNS~~	~~0.75~~ ~~1.80~~

~~8. Little Colorado River above Lyman Lake to above the Amity Ditch diversion near crossing of Arizona Highway 273 (applies only when in-stream turbidity is less than 50 NTU):~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~0.20~~ ~~0.70~~	~~0.30~~ ~~1.20~~	~~0.75~~ ~~1.50~~
~~9. Colorado River, at Northern International Boundary near Morelos Dam:~~	~~Total phosphorus~~ ~~Total nitrogen~~	~~NNS~~ ~~NNS~~	~~0.33~~ ~~2.50~~	~~NNS~~ ~~NNS~~
~~10. San Pedro River, from Curtis to Benson:~~	~~Total phosphorus~~ ~~Total nitrate as N~~	~~NNS~~ ~~NNS~~	~~NNS~~ ~~NNS~~	~~NNS~~ ~~10.00~~
~~11. The discharge of wastewater to Show Low Creek and tributaries upstream of and including Fools Hollow Lake shall not exceed 0.16 mg/L total phosphates as P.~~				
~~12. The discharge of wastewater to the San Francisco River and tributaries upstream of Luna Lake Dam shall not exceed 1.0 mg/L total phosphates as P.~~				

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
1. Verde River and its tributaries from the Verde headwaters to Bartlett Lake:			
Total phosphorus	0.10	0.30	1.00
Total nitrogen	1.00	1.50	3.00
2. Black River, Tonto Creek, and their tributaries that are not located on tribal lands:			
Total phosphorus	0.10	0.20	0.80
Total nitrogen	0.50	1.00	2.00
3. Salt River and its tributaries above Roosevelt Reservoir, excluding Pinal Creek, that are not located on tribal lands.			
Total phosphorus	0.12	0.30	1.00
Total nitrogen	0.60	1.20	2.00
4. Salt River below Stewart Mountain Dam to its confluence with the Verde River:			
Total phosphorus	0.05		0.20
Total nitrogen	0.60		3.00
5. Little Colorado River and its tributaries above River Reservoir in Greer, South Fork of Little Colorado River above South Fork Campground, and Water Canyon Creek above Apache-Sitgreaves National Forest boundary:			
Total phosphorus	0.08	0.10	0.75
Total nitrogen	0.60	0.75	1.10
6. Little Colorado River at the crossing of Apache County Road No. 124:			
Total phosphorus			0.75
Total nitrogen			1.80
7. Little Colorado River above Lyman Lake to above the Amity Ditch diversion near crossing of Arizona Highway 273 (applies only when in-stream turbidity is less than 50 NTU):			
Total phosphorus	0.20	0.30	0.75
Total nitrogen	0.70	1.20	1.50
8. Colorado River at the Northern International Boundary near Morelos Dam:			
Total phosphorus		0.33	
Total nitrogen		2.50	
9. Oak Creek from its headwaters at 35°01'30"/111°44'12" to its confluence with the Verde River at 34°40'41"/111°56'30" and the West Fork of Oak Creek from its headwaters at 35°02'44"/111°54'48" to its confluence with Oak Creek at 34°59'14"/111°44'46".			
Total phosphorus	1.00	1.50	2.50
Total nitrogen	0.10	0.25	0.30
10. No discharge of wastewater to Show Low Creek or its tributaries upstream of and including Fools Hollow Lake shall exceed 0.16 mg/L total phosphates as P.			

11. No discharge of wastewater to the San Francisco River or its tributaries upstream of Luna Lake Dam shall exceed 1.0 mg/L total phosphates as P.

~~G. The following water quality standards for radiochemicals shall not be exceeded in surface waters with the domestic water source designated use:~~

~~1. The concentration of gross alpha particle activity, including radium-226, but excluding radon and uranium, shall not exceed 15 picocuries per liter of water.~~
~~2. The concentration of combined radium-226 and radium-228 shall not exceed five picocuries per liter of water.~~
~~3. The concentration of strontium-90 shall not exceed 8 eight picocuries per liter of water.~~
~~4. The concentration of tritium shall not exceed 20,000 picocuries per liter of water.~~
~~5. The average annual concentration of beta particle activity and photon emitters from manmade radionuclides shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirems per year.~~

Footnotes:

[1] Includes A&Wc, A&Ww, A&Wedw, and A&We.
~~[2] Does not apply to Cholla Lake.~~
~~[3] Does not apply to a wastewater treatment plant discharge to a dry watercourse that creates an effluent-dependent water or to a stormwater discharge.~~
~~[4]~~[2] The dissolved oxygen water quality standard for a lake ~~shall apply~~ applies below the water surface but not at a depth greater than one meter.
~~[5] Means the annual mean of representative composite samples taken from the surface and at two and five meter depths.~~
~~[6] Means the maximum for any set of representative composite samples taken from the surface and at two and five meter depths.~~

R18-11-110. Salinity Standards for the Colorado River

A. The flow-weighted average annual salinity in the lower main stem of the Colorado River shall ~~be maintained at or below~~ not exceed the following ~~concentrations~~ criteria:

Location	Total Dissolved Solids
Below Hoover Dam	723 mg/L
Below Parker Dam	747 mg/L
At Imperial Dam	879 mg/L

B. ~~To preserve the basin-wide approach to salinity control developed by the Colorado River Basin states and to ensure compliance with the numeric criteria for salinity in subsection (A), the Department adopts the~~ The plan of implementation contained in the "~~1999~~ 2005 Review, Water Quality Standards for Salinity, Colorado River System," approved October 2005, ~~Colorado River Basin Salinity Control Forum, 106 West 500 South, Suite 101, Bountiful, Utah 84010-6232 (June, 1999), which is incorporated by reference and on file with the Office of the Secretary of State and the Department~~ is incorporated by reference to preserve the basin-wide approach to salinity control developed by the Colorado River Basin Salinity Control Forum and to ensure compliance with the numeric criteria for salinity in subsection (A). ~~This incorporation by reference contains no future editions or amendments.~~ This material does not include any later amendments or editions of the incorporated material. Copies of the incorporated material are available for inspection at the Arizona Department of Environmental Quality, 1110 W. Washington St., Phoenix, AZ 85007 or may be obtained from the Colorado River Basin Salinity Control Forum, 106 W. 500 S., Suite 101, Bountiful, UT 84010-6232.

R18-11-111. Analytical Methods

A. A person conducting an analysis of a sample taken to determine compliance with a water quality standard shall use an ~~approved~~ analytical method prescribed in ~~9 A.A.C. 14, Article 6~~ A.A.C. R9-14-610, 40 CFR 136.3, or an alternative analytical method ~~that is~~ approved ~~by the Director of the Arizona Department of Health Services~~ under ~~R9-16-610(B)~~ A.A.C. R9-14-610(B).

B. A test result from a sample taken to determine compliance with a water quality standard is valid only if the sample is analyzed by a laboratory that is licensed by the Arizona Department of Health Services, an out-of-state laboratory licensed under A.R.S. § 36-495.14, or a laboratory exempted under A.R.S. § 36-495.02, for the analysis performed.

R18-11-112. ~~Unique~~ Outstanding Arizona Waters

A. The Director shall classify a surface water as ~~a unique water~~ an outstanding Arizona water (OAW) by rule. ~~The Director shall consider nominations to classify a surface water as a unique water during the triennial review of water quality standards for surface waters.~~

B. The Director may adopt, ~~by rule~~ under R18-11-115, a site-specific ~~water quality standards~~ standard to maintain and protect existing water quality in ~~a unique water~~ an OAW.

C. Any person may nominate a surface water for classification as ~~a unique water~~ an OAW by filing a nomination with the ~~Department~~ Director. The nomination ~~to classify a surface water as a unique water~~ shall include:

1. A map and a description of the surface water;
2. A written statement in support of the nomination, including specific reference to the applicable criteria for ~~unique water~~ an OAW classification prescribed in subsection (D);
3. Supporting evidence demonstrating that the ~~applicable unique water~~ criteria prescribed in subsection (D) are met; and
4. Available water quality data relevant to establishing the baseline water quality of the proposed ~~unique water~~ OAW.

D. The Director may classify a surface water as ~~a unique water upon finding that the surface water is an outstanding state resource water~~ an OAW based upon the following criteria:

1. The surface water is a perennial or intermittent water;
2. The surface water is in a free-flowing condition. For purposes of this subsection, "in a free-flowing condition" means that a surface water does not have an impoundment, diversion, channelization, rip-rapping or other bank armor, or another hydrological modification within the reach nominated for ~~a unique water~~ an OAW classification;
3. The surface water has good water quality. For purposes of this subsection, "good water quality" means that the surface water has water quality that meets or ~~exceeds~~ is better than applicable surface water quality standards. A surface water that is listed as impaired under ~~§ 303(d) of the Clean Water Act (33 U.S.C. § 1313)~~ A.A.C. R18-11-604(E) is ineligible for ~~unique waters~~ OAW classification; and
4. The surface water meets one or both of the following conditions:
   a. The surface water is of exceptional recreational or ecological significance because of its unique attributes, ~~including but not limited to, attributes related to~~ such as the geology, flora~~,~~ and fauna, water quality, aesthetic ~~values~~ value, or the wilderness ~~characteristics~~ characteristic of the surface water~~.~~;
   b. ~~Threatened or endangered species are known to be~~ An endangered or threatened species is associated with the surface water and the existing water quality is essential to ~~the~~ its maintenance and propagation ~~of a threatened or endangered species~~ or the surface water provides critical habitat for a threatened or endangered species. ~~Endangered or~~ An endangered or threatened ~~-~~species are identified in "Endangered and Threatened Wildlife ~~and Plants~~," 50 CFR ~~§~~ 17.11 (revised 2005), and ~~§~~ "Endangered and Threatened Plants," 50 CFR 17.12 (revised ~~as of October 1, 2000~~ 2005). ~~which~~ This material is incorporated by reference ~~and on file with the Department and the Office of the Secretary of State. This incorporation by reference contains no future editions or amendments.~~ and does not include any later amendments or editions of the incorporated material. Copies of the incorporated material are available for inspection at the Arizona Department of Environmental Quality, 1110 W. Washington St., Phoenix, AZ 85007 or may be obtained from the National Archives and Records Administration at http://www.access.gpo.gov/nara/cfr/cfr-table-search.html#page1.

E. The Director shall hold at least one public meeting in the local area of a surface water that is nominated for classification as an OAW to solicit public comment on the nomination.

F. The Director shall consider the following factors when making a decision whether to classify a surface water as an OAW.

1. Whether there is the ability to manage the surface water and its watershed to maintain and protect existing water quality;
2. The social and economic impact of Tier 3 antidegradation protection;
3. The public comments in support of, or in opposition to, an OAW classification;
4. The timing of the nomination relative to the triennial review of surface water quality standards;
5. The consistency of an OAW classification with applicable water quality management plans; and
6. Whether the nominated surface water is located within a national or state park, national monument, national recreation area, wilderness area, riparian conservation area, area of critical environmental concern, or it has another special use designation (for example, Wild and Scenic River).

~~**E.**~~**G.** The following surface waters are classified as ~~unique water~~ OAWs:

1. The West Fork of the Little Colorado River, ~~above~~ from its headwaters at 33°55'02"/109°33'30" to Government Springs at 33°59'33"/109°27'54" (approximately 9.1 river miles);
2. Oak Creek, ~~including the West Fork of Oak Creek~~ from its headwaters at 35°01'30"/111°44'12" to its confluence with the Verde River at 34°40'41"/111°56'30" (approximately 50.3 river miles);
3. West Fork of Oak Creek, from its headwaters at 35°02'44"/111°54'48" to its confluence with Oak Creek at 34°59'14"/111°44'46" (approximately 15.8 river miles);

~~3.~~4. ~~Peoples~~ Peeples Canyon Creek, ~~tributary to the Santa Maria River~~ from its headwaters at 34°23'57"/113°19'45" to its confluence with the Santa Maria River at 34°20'36"/113°15'12" (approximately 8.1 river miles);

~~4.~~5. Burro Creek, ~~above its confluence with Boulder Creek~~ from its headwaters at 34°52'46.5"/113°05'13.5" to its confluence with Boulder Creek at 34°374.5"/113°18'36" (approximately 29.5 miles);

~~5.~~6. Francis Creek, ~~in Mohave and Yavapai counties~~ from its headwaters at 34°54'38"/113°20'30" to its confluence with Burro Creek at 34°44'29"/113°14'37" (approximately 22.9 river miles);

~~6.~~7. Bonita Creek, ~~tributary to the upper Gila River~~ from its boundary of the San Carlos Indian Reservation at 33°03'08"/109°33'41" to its confluence with the Gila River at 32°53'36"/109°28'43" (approximately 14.7 river miles);

~~7.~~8. Cienega Creek, from its confluence with Gardner Canyon and Spring Water Canyon at ~~R18E T17S~~ 31°47'38.5"/110°35'21.5" to the USGS gaging station at 32°02'09"/110°40'34"~~, in Pima County~~ (approximately 28.3 river miles);

~~8.~~9. Aravaipa Creek, from its confluence with Stowe Gulch at 32°52'10"/110°22'03" to the downstream boundary of the Aravaipa Canyon Wilderness Area at 32°54'23"/110°33'42" (approximately 15.5 river miles);
~~9.~~10. Cave Creek ~~and the South Fork of Cave Creek (Chiricahua Mountains)~~, from ~~the~~ its headwaters at 31°50'30"/109°17'04.5" to the Coronado National Forest boundary at 31°54'38"/109°08'40" (approximately 10.4 river miles);
11. South Fork of Cave Creek, from its headwaters at 31°50'20"/109°16'33" to its confluence with Cave Creek at 31°53'04"/109°10'30" (approximately 8.6 river miles);
~~10.~~12. Buehman Canyon Creek, from its headwaters ~~(Lat. 32°24'55.5" N, Long. 110°39'43.5"W)~~ at 32°52'0.5"/110°39'54.5" to ~~approximately 9.8 miles downstream (Lat. 32°24'31.5" N, Long. 10°32'08" W)~~ its confluence with unnamed tributary at 32°24'31.5"/110°32'08" (approximately 9.8 river miles);
~~11.~~13. Lee Valley Creek, from its headwaters at 33°55'49"/109°31'34" to its confluence with Lee Valley Reservoir at 33°56'28"/109°30'15.5" (approximately 1.6 river miles);
~~12.~~14. Bear Wallow Creek, from its headwaters at 33°35'54"/109°26'54.5" to the boundary of the San Carlos Indian Reservation at 33°37'52"/109°29'44" (approximately 4.25 river miles);
~~13.~~15. North Fork of Bear Wallow Creek, from its headwaters at 33°34'47.5"/109°21'59.5" to its confluence with Bear Wallow Creek at 33°35'54"/109°26'54.5" (approximately 3.8 river miles);
~~14.~~16. South Fork of Bear Wallow Creek, from its headwaters at 33°34'38.5"/109°23'58" to its confluence with Bear Wallow Creek at 33°35'54"/109°26'54.5" (approximately 3.8 river miles);
~~15.~~17. Snake Creek, from its headwaters at 33°37'21.5"/109°26'11" to its confluence with the Black River at 33°40'31.5"/109°28'58.5" (approximately 6.2 river miles);
~~17.~~18. Hay Creek, from its headwaters at 33°51'00"/109°28'48" to its confluence with the West Fork of the Black River at 33°48'30"/109°25'19" (approximately 5.5 river miles);
~~18.~~19. Stinky Creek, from the ~~Fort~~ White Mountain Apache Indian Reservation boundary at 33°52'36.5"/109°29'45" to its confluence with the West Fork of the Black River at 33°51'21.5"/109°27'09.5" (approximately 3.0 river miles); ~~and~~
~~19.~~20. KP Creek, from its headwaters at 33°34'03"/109°21'19" to its confluence with the Blue River at 33°31'44"/109°12'04.5" (approximately 12.7 river miles)~~.~~;
22. Davidson Canyon, from its headwaters at the unnamed spring at 31°59'00"/110°38'46" to its confluence with Cienega Creek; and
22. Fossil Creek, from its headwaters at the confluence of Sandrock and Calf Pen Canyons above Fossil Springs at 34°26'48.7"/111°32'25" to its confluence with the Verde River at 34°18'21.8"/111°40'31.6" (approximately 17.2 river miles).

~~**F.** The Department shall hold at least one public meeting in the local area of a nominated unique water to solicit public comment on the nomination.~~

~~**G.** The Director may consider the following factors when making a decision whether to classify a nominated surface water as a unique water:~~
~~1. Whether there is the ability to manage the unique water and its watershed to maintain and protect existing water quality;~~
~~2. The social and economic impact of Tier 3 antidegradation protection;~~
~~3. The public comments in support or opposition to a unique waters classification;~~
~~4. The support or opposition of federal and state land management and natural resources agencies to a nomination;~~
~~5. Agency resource constraints;~~
~~6. The timing of the unique water nomination relative to the triennial review of surface water quality standards;~~
~~7. The consistency of a unique water classification with applicable water quality management plans (for example, § 208 water quality management plans); and~~
~~8. Whether the nominated surface water is located within a national or state park, national monument, national recreation area, wilderness area, riparian conservation area, area of critical environmental concern, or it has another special use designation (for example, Wild and Scenic River designation).~~

~~**H.** The following water quality standards apply to the listed unique waters. Water quality standards prescribed in this subsection supplement the water quality standards prescribed by this Article.~~

~~1. The West Fork of the Little Colorado River, above Government Springs:~~

~~**Parameter**~~	~~**Standard**~~
~~pH (standard units)~~	~~No change due to discharge~~
~~Temperature~~	~~No increase due to discharge~~
~~Dissolved oxygen~~	~~No decrease due to discharge~~
~~Total dissolved solids~~	~~No increase due to discharge~~
~~Chromium (as Cr)(D)~~	~~10 µg / L~~

~~2. Oak Creek, including the West Fork of Oak:~~

~~**Parameter**~~	~~**Standard**~~
~~pH (standard units)~~	~~No change due to discharge~~
~~Nitrogen (T)~~	~~1.00 mg / L (annual mean)~~
	~~1.50 mg / L (90th percentile)~~
	~~2.50 mg / L (single sample max.)~~
~~Phosphorus (T)~~	~~0.10 mg / L (annual mean)~~
	~~0.25 mg / L (90th percentile)~~
	~~0.30 mg / L (single sample max.)~~
~~Chromium (as Cr) (D)~~	~~5 µg / L~~
~~Turbidity change due to discharge~~	~~3 NTUs~~

~~3. Peoples Canyon Creek, tributary to the Santa Maria:~~

~~**Parameter**~~	~~**Standard**~~
~~Temperature~~	~~No increase due to discharge~~
~~Dissolved oxygen~~	~~No decrease due to discharge~~
~~Turbidity change due to discharge~~	~~5 NTUs~~
~~Arsenic (T)~~	~~20 µg / L~~
~~Manganese (T)~~	~~500 µg / L~~

~~4. Burro Creek, above its confluence with Boulder Creek:~~

~~**Parameter**~~	~~**Standard**~~
~~Manganese (T)~~	~~500 µg / L~~

~~5. Francis Creek, in Mohave and Yavapai counties:~~

~~**Parameter**~~	~~**Standard**~~
~~Manganese (T)~~	~~500 µg / L~~

~~6. Cienega Creek, from its confluence with Gardner Canyon and Spring Water Canyon at R18E T17S to Del Lago Dam, in Pima County:~~

~~**Parameter**~~	~~**Standard**~~
~~pH~~	~~No change due to discharge~~
~~Temperature~~	~~No increase due to discharge~~
~~Dissolved oxygen~~	~~No decrease due to discharge~~
~~Total dissolved solids~~	~~No increase due to discharge~~
~~Turbidity~~	~~10 NTUs~~

~~7. Bonita Creek, tributary to the Upper Gila River:~~

~~**Parameter**~~	~~**Standard**~~
~~pH~~	~~No change due to discharge~~
~~Temperature~~	~~No increase due to discharge~~
~~Dissolved oxygen~~	~~No decrease due to discharge~~
~~Total dissolved solids~~	~~No increase due to discharge~~
~~Turbidity~~	~~15 NTUs~~

~~Abbreviations:~~
~~"(D)" means dissolved fraction~~
~~"(T)" means total recoverable~~
~~"NTUs" means nephelometric turbidity units~~
~~"mg / L" means milligrams per liter~~
"µg / L" means micrograms per liter

H. Fossil Creek, listed in subsection (G)(22), takes effect as an OAW on June 30, 2010.

R18-11-113. ~~Effluent-dependent~~ Effluent-Dependent Waters

A. The Director shall classify a surface water as an effluent-dependent water by rule.

B. The Director may adopt, by rule, site-specific water quality standards for an effluent-dependent water.

C. Any person may submit a petition for rule adoption requesting that the Director classify a surface water as an effluent-dependent water. The petition ~~for rule adoption~~ shall include:

1. A map and a description of the surface water~~,~~;
2. Information that demonstrates that the surface water consists of ~~discharges of treated wastewater~~ a point source discharge of wastewater; and
3. Information that demonstrates that, without a point source discharge of a wastewater, the receiving water is an ephemeral water ~~in the absence of the discharge of treated wastewater~~.

~~**D.** The following surface waters are classified as effluent-dependent waters:~~

~~1. In the Colorado River Main Stem Basin:~~
   ~~a. Bright Angel Wash from the South Rim Grand Canyon WWTP outfall to its confluence with Coconino Wash,~~
   ~~b. Cataract Creek from the Williams WWTP outfall to one kilometer downstream from the outfall,~~
   ~~c. Holy Moses Wash from the Kingman WWTP outfall to three kilometers downstream from the outfall, and~~
   ~~d. Transept Canyon from the North Rim Grand Canyon WWTP outfall to one kilometer downstream from the outfall.~~

~~2. In the Little Colorado River Basin:~~
   ~~a. Dry Lake,~~
   ~~b. Lake Humphreys,~~
   ~~c. Lower Walnut Canyon Lake,~~
   ~~d. Ned Lake,~~
   ~~e. Pintail Lake,~~
   ~~f.~~ Telephone Lake,
   ~~g. Rio de Flag from the City of Flagstaff WWTP outfall to its confluence with San Francisco Wash, and~~
   ~~h. Whale Lake.~~

~~3. In the Middle Gila River Basin:~~
   ~~a. Unnamed wash from the Town of Prescott Valley WWTP outfall to its confluence with the Agua Fria River, and the Agua Fria River below its confluence with the unnamed wash receiving treated wastewater from the Prescott Valley WWTP to State Route 169;~~
   ~~b. Agua Fria river from the El Mirage WWTP outfall to two kilometers downstream from the outfall;~~
   ~~c. Gila River from the Florence WWTP outfall to Felix Road,~~
   ~~d. Gila River from its confluence with the Salt River to Gillespie Dam;~~
   ~~e. Queen Creek from the Town of Superior WWTP outfall to its confluence with Potts Canyon;~~
   ~~f. Unnamed wash from the Gila Bend WWTP outfall to its confluence with the Gila River;~~
   ~~g. Unnamed wash from the Luke AFB WWTP outfall to its confluence with the Agua Fria River; and~~
   ~~h. Unnamed wash from the Queen Valley WWTP outfall to its confluence with Queen Creek.~~

~~4. In the Rios de Mexico Basin:~~
   ~~a. Mule Gulch, from the Bisbee WWTP outfall to the Highway 80 bridge, and~~
   ~~b. Unnamed wash from the Bisbee-Douglas International Airport WWTP outfall to Whitewater Draw.~~

~~5. In the Salt River Basin:~~
   ~~a. Unnamed wash from the Globe WWTP outfall to its confluence with Pinal Creek and Pinal Creek from its confluence with the unnamed wash to Radium, and~~
   ~~b. Salt River from the 23rd Avenue WWTP outfall to its confluence with the Gila River.~~

~~6. In the San Pedro River Basin:~~
   ~~a. Unnamed wash from the Mt. Lemmon WWTP outfall to 0.25 kilometers downstream, and~~
   ~~b. Walnut Gulch from the Tombstone WWTP outfall to its confluence with Tombstone Gulch.~~

~~7. In the Santa Cruz Basin:~~
   ~~a. Santa Cruz River from the Nogales International WWTP outfall to Tubac Bridge,~~
   ~~b. Santa Cruz River from the Roger Road WWTP outfall to Baumgartner Road crossing,~~
   ~~c. Unnamed wash from the Oracle WWTP outfall to five kilometers downstream, and~~
   ~~d. Sonoita Creek from the Town of Patagonia WWTP outfall to 750 feet downstream.~~

~~8. In the Upper Gila River Basin:~~
   ~~a. Bennett Wash from the Arizona Department of Corrections-Safford WWTP outfall to the Gila River. and~~
   ~~b. Unnamed wash from the Arizona Department of Corrections-Globe WWTP outfall to the boundary of the San Carlos Indian Reservation.~~

~~9. In the Verde River Basin:~~
   ~~a. American Gulch from the Northern Gila County Sanitary District WWTP outfall to the East Verde River,~~
   ~~b. Bitter Creek from the Jerome WWTP outfall to 2.5 kilometers downstream from the outfall, and~~
   ~~c. Jacks Canyon Wash from the Big Park WWTP outfall to its confluence with Dry Beaver Creek.~~

~~10. In the Willcox Playa Basin: Lake Cochise~~

~~E.~~**D.** The ~~NPDES permit issuing authority~~ Director shall use the water quality standards that apply to an effluent-dependent water to derive ~~discharge limitations~~ water quality-based effluent limits for a point source discharge ~~from a wastewater treatment plant~~ of wastewater to an ephemeral water ~~that changes that ephemeral water into an effluent-dependent water~~.

E. The Director may use aquatic and wildlife (edw) acute standards only to derive water quality based effluent limits for a sporadic, infrequent, or emergency point source discharge to an ephemeral water or to an effluent-dependent water. The Director shall consider the following factors when deciding whether to apply A&Wedw (acute) standards:

1. The amount, frequency, and duration of the discharge,
2. The length of time water may be present in the receiving water,
3. The distance to a downstream water with aquatic and wildlife chronic standards, and
4. The likelihood of chronic exposure to pollutants.

F. The Director may establish alternative water quality-based effluent limits in an AZPDES permit based on seasonal differences in the discharge.

~~**F.** The site-specific standard of 36 µg / L for dissolved copper for the aquatic and wildlife (effluent-dependent water) designated use applies to the Rio de Flag from the City of Flagstaff WWTP outfall to its confluence with the San Francisco Wash.~~

R18-11-114. Mixing Zones

A. The Director may establish a mixing zone for a point source discharge to a surface water as a condition of ~~a NPDES~~ an AZPDES permit. ~~Mixing zones are~~ A mixing zone is prohibited in an ephemeral ~~waters~~ water or where there is no water for dilution.

B. The owner or operator of a point source seeking the establishment of a mixing zone shall submit a ~~mixing zone application to the Department on a standard form that is available from the Department~~ request to the Director for a mixing zone as part of an application for an AZPDES permit. The ~~application~~ request shall include:

1. ~~Identification~~ An identification of the pollutant for which the mixing zone is requested;
2. A proposed outfall design;
3. A definition of the boundary of the proposed mixing zone. For purposes of this subsection, the boundary of a mixing zone means the location where the concentration of treated wastewater across a transect of the surface water differs by less than 5~~%~~ percent; and
4. A complete and detailed description of the existing physical, biological, and chemical conditions of the receiving water and the predicted impact of the proposed mixing zone on those conditions.

C. The ~~Department~~ Director shall review the ~~application~~ request for a mixing zone to determine whether the ~~application~~ written request is complete. If the ~~application~~ request is incomplete, the ~~Department~~ Director shall ~~identify in writing~~ provide the applicant with a list of the additional information required ~~that must be submitted to the Department to complete the mixing zone application~~.

D. The Director shall consider the following factors when deciding whether to grant or deny a request for a mixing zone:

1. The assimilative capacity of the receiving water;
2. The likelihood of adverse human health effects;
3. The location of drinking water plant intakes and public swimming areas;
4. The predicted exposure of biota and the likelihood that resident biota will be adversely affected;
5. Bioaccumulation ~~and bioconcentration~~;
6. Whether there will be acute toxicity in the mixing zone, and, if so, the size of the ~~area of acute toxicity~~ zone of initial dilution;
7. The known or predicted safe exposure levels for the pollutant of concern;
8. The size of the mixing zone;
9. The location of the mixing zone relative to biologically sensitive areas in the surface water;
10. The concentration gradient of the pollutant within the mixing zone;
11. Sediment deposition;
12. The potential for attracting aquatic life to the mixing zone; and
13. The cumulative impacts of other mixing zones and other discharges to the surface water.

E. Director determination.

1. The Director shall deny ~~the~~ a request to establish a mixing zone if a water quality ~~standards~~ standard will be violated outside the boundaries of the proposed mixing zone ~~will be violated~~. The Director shall notify the owner or operator of the denial ~~of a request for a mixing zone shall be~~ in writing and shall state the reason for the denial.
2. If the Director ~~determines that~~ approves the request to establish a mixing zone ~~should be established~~, the Director shall establish the mixing zone as a condition of ~~a NPDES~~ an AZPDES permit. The Director ~~may~~ shall include any mixing zone ~~conditions~~ condition in the AZPDES permit that ~~the Director deems~~ is necessary to protect human health and the designated uses of the surface water.

F. Any person who is adversely affected by the Director's decision to grant or deny a request for a mixing zone may appeal the decision ~~to an administrative law judge~~ under A.R.S. §§ 49-321 and ~~A.R.S. §~~ 41-1092 et seq.

G. The ~~Department~~ Director shall reevaluate a mixing zone upon issuance, reissuance, or modification of the ~~National Pollutant Discharge Elimination System~~ AZPDES permit for the point source or a modification of the outfall structure.

~~**H.** The length of a mixing zone shall not exceed 500 meters in a stream. The total horizontal area allocated to all mixing zones on a lake shall not exceed 10% of the surface area of the lake. Adjacent mixing zones in a lake shall be no closer than the greatest horizontal dimension of any individual mixing zone.~~

~~**I.** A mixing zone shall provide for a zone of passage of not less than 50% of the cross-sectional area of a river or stream.~~

~~**J.** The discharge outfall shall be designed to maximize initial dilution of the treated wastewater in a surface water.~~

H. Mixing zones requirements.

1. The length of a mixing zone shall not exceed 500 meters in a stream.
2. The total horizontal area allocated to all mixing zones on a lake shall not exceed 10 percent of the surface area of the lake.
3. Adjacent mixing zones in a lake shall not overlap or be located closer together than the greatest horizontal dimension of the largest mixing zone.
4. A mixing zone shall provide for a zone of passage of not less than 50 percent of the cross-sectional area of a river or stream.
5. The design of any discharge outfall shall maximize initial dilution of the treated wastewater in a surface water.
6. The size of the zone of initial dilution in a mixing zone shall prevent lethality to drifting organisms passing through the zone of initial dilution.

K. ~~A mixing zone is prohibited~~ The Director shall not establish a mixing zone in an AZPDES permit for the following persistent, bioaccumulative pollutants:

1. Chlordane,
2. DDT and its metabolites (DDD and DDE),
3. Dieldrin,
4. Dioxin,
5. Endrin,
6. Endrin aldehyde,
7. Heptachlor,
8. Heptachlor epoxide,
9. Lindane,
10. Mercury,
11. Polychlorinated biphenyls (PCBs), and
12. Toxaphene.

R18-11-115. ~~Repealed~~ Site-Specific Standards

A. The Director shall adopt a site-specific standard by rule.

B. The Director may adopt a site-specific standard for any of the following reasons:

1. Local physical, chemical, or hydrological conditions of a surface water such as pH, hardness, or temperature alters the biological availability or toxicity of a pollutant;
2. The sensitivity of resident aquatic organisms that occur in a surface water to a pollutant differs from the sensitivity of the species used to derive the numeric water quality standards to protect aquatic life in Appendix A;
3. Resident aquatic organisms that occur in a surface water represent a narrower mix of species than those in the dataset used by the Department to derive numeric water quality standards to protect aquatic life in Appendix A; or
4. The natural background concentration of a pollutant is greater than the numeric water quality standard to protect aquatic life prescribed in Appendix A.

C. Site-specific study. A person shall conduct a study to support the development of a site-specific standard using one of the following procedures:

1. The Recalculation Procedure, Appendix L, pages 90 - 98, Water Quality Standards Handbook, Second Edition, EPA 823-B-94-005b, August 1994. This material is incorporated by reference and does not include any later amendments or editions of the incorporated material. A copy of the incorporated material is available for inspection at the Arizona Department of Environmental Quality, 1110 W. Washington St., Phoenix, AZ 85007 or: may be obtained from the U.S. Environmental Protection Agency, Office of Water at http://www.epa.gov/waterscience/standards/handbook/handbookappxL.pdf.
2. Water-Effects Ratio for Metals, Appendix L, pages 1 - 89, Water Quality Standards Handbook, Second Edition, EPA 823-B-94-005b, August 1994. This material is incorporated by reference and does not include any later amendments or editions of the incorporated material. A copy of the incorporated material is available for inspection at the Arizona Department of Environmental Quality, 1110 W. Washington St., Phoenix, AZ 85007 or: may be obtained from the U.S. Environmental Protection Agency, Office of Water at http://www.epa.gov/waterscience/standards/handbook/handbookappxL.pdf.
3. Streamlined Water Effects Ratio Procedure for Discharges of Copper, EPA-822-R-01-005, March 2001. This material

is incorporated by reference and does not include any later amendments or editions of the incorporated material. A copy of the incorporated material is available for inspection at the Arizona Department of Environmental Quality, 1110 W. Washington St., Phoenix, AZ 85007 or: may be obtained from the U.S. Environmental Protection Agency, Office of Water at http://www.epa.gov/ost/criteria/copper/copper.pdf.

4. Natural background.
   a. A person seeking to develop a site-specific standard based on natural background shall provide a study outline to the Director and obtain approval before conducting the study.
      i. The person may use statistical or modeling approaches to determine natural background concentration.
      ii. Modeling approaches include Better Assessment Science Integrating Source and Nonpoint Sources (Basins), Hydrologic Simulation Program-Fortran (HSPF), and Hydrologic Engineering Center (HEC) programs developed by the U.S. Army Corps of Engineers.
   b. The Director may establish a site-specific standard at a concentration equal to the natural background concentration.
   c. For purposes of this subsection, "natural background" means the concentration of a pollutant in a surface water due only to non-anthropogenic sources.

R18-11-116. Resource ~~management agencies~~ Management Agencies

Nothing in this Article ~~shall be construed to prohibit~~ prohibits fisheries management activities by the Arizona Game and Fish Department or the U.S. Fish and Wildlife Service. This ~~provision~~ Article does not exempt fish hatcheries from ~~National Pollutant Discharge Elimination System~~ AZPDES permit requirements.

R18-11-117. Canals and Municipal Park Lakes

A. Nothing in this Article ~~shall be construed to prevent~~ prevents the routine physical or mechanical maintenance of canals, drains, and the municipal park lakes identified in Appendix B. Physical or mechanical maintenance includes dewatering, lining, dredging, and the physical, biological, or chemical control of weeds and algae. ~~Increases in turbidity that result from physical or mechanical maintenance activities are permitted in canals, drains, and the municipal park lakes identified in Appendix B.~~

B. The discharge of lubricating oil ~~that is~~ associated with the start-up of well pumps ~~which~~ that discharge to canals is not a violation of R18-11-108(B).

R18-11-118. Dams and Flood Control Structures

~~**A.** Increases in turbidity that result from the routine physical or mechanical maintenance of a dam or flood control structure are not violations of this Article.~~

~~**B.**~~ Nothing in this Article ~~shall be construed to require~~ requires the release of water from a dam or a flood control structure.

R18-11-121. Schedules of Compliance

A. ~~A~~ The Director may establish a schedule to bring an existing point source into compliance with a new or revised water quality standard ~~may be established~~ in ~~a National Pollutant Discharge Elimination System~~ an AZPDES permit ~~for an existing point source~~. A compliance schedule in an AZPDES permit for an existing point source, other than a ~~storm water~~ stormwater discharge, shall require ~~compliance~~ the permittee to comply with a discharge limitation based upon a new or revised water quality standard no later than three years after the effective date of the ~~National Pollutant Discharge Elimination System~~ AZPDES permit. ~~For a schedule of compliance to be granted, the owner or operator of the existing point source~~ The permittee shall demonstrate that all requirements under § 301(b) and § 306 of the Clean Water Act [33 U.S.C. ~~§~~ 1311(b) and ~~§~~ 1316] ~~have been~~ are achieved and that the point source cannot comply with a discharge limitation based upon the new or revised water quality standard through the application of existing water pollution control technology, operational changes, or source reduction.

B. ~~A~~ The Director may establish a schedule of compliance ~~may be established~~ in ~~a National Pollutant Discharge Elimination System~~ an AZPDES permit for a new point source. The first ~~National Pollutant Discharge Elimination System~~ AZPDES permit issued to a new point source may contain a schedule of compliance only when necessary to allow ~~a reasonable opportunity~~ the permittee to attain compliance with a new or revised water quality standard that becomes effective after commencement of construction but less than three years before ~~commencement of~~ the discharge begins. For purposes of this subsection, "commencement of construction" means that the owner or operator of the point source has obtained the federal, state, and local approvals or permits necessary to begin physical construction of the point source and either:

1. Onsite physical construction has begun; or
2. The owner or operator has entered into a contract for physical construction of the point source and the contract cannot be cancelled or modified without substantial loss. For purposes of this subsection, "substantial loss" means in excess of 10~~%~~ percent of the total cost incurred for physical construction.

C. ~~A~~ The Director may establish a schedule of compliance ~~may be established~~ in ~~a National Pollutant Discharge Elimination System~~ an AZPDES permit for a recommencing point source discharge. The first ~~National Pollutant Discharge Elimination System~~ AZPDES permit issued to a recommencing point source ~~discharge~~ discharger may contain a schedule of com-

pliance only when necessary ~~to allow a reasonable opportunity~~ to attain compliance with a new or revised water quality standard that ~~becomes~~ is effective less than three years before recommencement of the discharge.

D. ~~A~~ The Director may establish a schedule to bring a point source discharge of ~~storm water~~ stormwater into compliance with a water quality standard ~~may be established~~ in ~~a National Pollutant Discharge Elimination System~~ an AZPDES permit. A compliance schedule for a ~~storm water~~ stormwater discharge shall require implementation of all reasonable and cost-effective best management practices to control the discharge of pollutants in ~~storm water~~ stormwater.

R18-11-122. Variances

A. The Director ~~may grant~~ shall consider a variance from a water quality standard for a point source discharge if the discharger demonstrates that treatment more advanced than that required to comply with technology-based effluent limitations is necessary to comply with the water quality standard and:

1. It is not technically feasible to achieve compliance within the next five years,
2. The cost of the treatment would result in substantial and widespread economic and social impact, or
3. Human-caused conditions or sources of pollution prevent attainment of the water quality standard and cannot be remedied within the next five years.

~~**B.** A variance may be granted only on a pollutant-specific basis. A point source discharge is required to comply with all other applicable water quality standards for which a variance is not granted.~~

~~**C.** A variance applies only to a specific point source discharge. The granting of a variance does not modify a water quality standard. Other point source dischargers to the surface water shall comply with applicable water quality standards, including any water quality standard for which a variance has been granted for a specific point source discharge.~~

B. If the Director grants a variance for a point source discharge:

1. The Director shall issue the variance for a fixed term not to exceed five years,
2. The variance shall apply only on a pollutant-specific basis. The point source discharge shall meet all other applicable water quality standards for which a variance is not granted, and
3. The variance shall not modify a water quality standard. Other point source discharges to the surface water shall meet applicable water quality standards.

~~**D.**~~**C.** ~~A variance is for a fixed term not to exceed five years.~~ Upon expiration of a variance, a point source discharger shall either comply with the water quality standard or apply for renewal of the variance. To renew a variance, the applicant shall demonstrate reasonable progress towards compliance with the water quality standard during the term of the variance.

~~**E.**~~**D.** The ~~Department~~ Director shall reevaluate a variance upon the issuance, reissuance, or modification of the ~~National Pollutant Discharge Elimination System~~ AZPDES permit for the point source discharge.

~~**F.**~~**E.** A person who seeks a variance from a water quality standard shall submit a written request for a variance to the ~~Department~~ Director. A request for a variance shall include the following information:

1. Identification of the specific pollutant and water quality standard for which a variance is sought;
2. Identification of the receiving surface water;
3. For an existing point source discharge, a detailed description of the existing discharge control technologies that are used to achieve compliance with applicable water quality standards. For a new point source discharge, a detailed description of the proposed discharge control technologies that will be used to achieve compliance with applicable water quality standards;
4. Documentation that the existing or proposed discharge control technologies will comply with applicable technology-based effluent limitations and that more advanced treatment technology is necessary to achieve compliance with the water quality standard for which a variance is sought;
5. A detailed discussion of the reasons why compliance with the water quality standard cannot be achieved;
6. A detailed discussion of the discharge control technologies that are available for achieving compliance with the water quality standard for which a variance is sought;
7. Documentation of one of the following:
   a. That it is not technically feasible to install and operate any of the available discharge control technologies to achieve compliance with the water quality standard for which a variance is sought,
   b. That installation and operation of each of the available discharge technologies to achieve compliance with the water quality standard would result in substantial and widespread economic and social impact, or
   c. That human-caused conditions or sources of pollution prevent the attainment of the water quality standard for which the variance is sought and it is not possible to remedy the conditions or sources of pollution within the next five years;
8. Documentation that the point source discharger has reduced, to the maximum extent practicable, the discharge of the pollutant for which a variance is sought through implementation of a local pretreatment, source reduction, or waste minimization program~~.~~; and
9. A detailed description of proposed interim discharge limitations that represent the highest level of treatment achievable by the point source discharger during the term of the variance. ~~Interim discharge limitations shall not be less stringent than technology-based effluent limitations.~~

~~G.~~**F.** ~~In making a decision on whether to grant or deny the request for a variance, the~~ The Director shall consider the following factors when deciding whether to grant or deny a variance request:
1. Bioaccumulation ~~and bioconcentration~~,
2. The predicted exposure of biota and the likelihood that resident biota will be adversely affected,
3. The known or predicted safe exposure levels for the pollutant of concern, and
4. The likelihood of adverse human health effects.

~~H.~~**G.** The ~~Department~~ Director shall issue a public notice and ~~shall~~ provide an opportunity for a public hearing on whether the request for a variance should be granted or denied under ~~procedures prescribed in R18-1-401 and R18-1-402~~ A.A.C. R18-9-A907 and A.A.C. R18-9-A908. An interested party may request a public hearing on a variance under A.A.C. R18-9-A908(B).

H. Any variance considered for adoption by the Director is subject to review and approval by the Regional Administrator.

I. Any person who is adversely affected by a decision of the Director to grant or deny a variance may appeal the decision ~~to an administrative law judge~~ under A.R.S. §§ 49-321 and ~~A.R.S. §~~ 41-1092 et seq.

J. The ~~Department~~ Director shall not grant a variance for a point source discharge to ~~a unique water~~ an OAW listed in ~~R18-11-112~~ R18-11-112(G).

~~**K.** A variance is subject to review and approval by the Regional Administrator of the U.S. Environmental Protection Agency.~~

R18-11-123. ~~Prohibition Against~~ Discharge Prohibitions

A. The discharge of ~~treated~~ wastewater to ~~Sabino Creek is~~ the following surface waters is prohibited~~.~~:
1. Sabino Canyon Creek;
2. Vekol Wash, upstream of the Ak-Chin Indian Reservation;
3. Smith Wash, upstream of the Ak-Chin Indian Reservation;
4. Santa Rosa Wash, from its confluence with Greene Wash to the Ak-Chin Indian Reservation; and
5. Santa Cruz Wash, from its confluence with the North Branch of the Santa Cruz Wash to the Ak Chin Indian Reservation.

B. The discharge of human body wastes and the wastes from toilets and other receptacles intended to receive or retain those wastes on a vessel to Lake Powell is prohibited.

Appendix A~~:~~. Numeric Water Quality ~~Criteria~~ Standards

~~**Appendix A: Numeric Water Quality Criteria**~~ ~~**Table 1. Human Health and Agricultural Designated Uses**~~							
~~**PARAMETER**~~	~~**CAS* NUMBER**~~	~~**DWS (µg/L)**~~	~~**FC (µg/L)**~~	~~**FBC (µg/L)**~~	~~**PBC (µg/L)**~~	~~**AgI (µg/L)**~~	~~**AgL (µg/L)**~~
~~Acenaphthene~~	~~83-32-9~~	~~420~~	~~2670~~	~~84,000~~	~~84,000~~	~~NNS~~	~~NNS~~
~~Acenaphthylene~~	~~208-96-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Acrolein~~	~~107-02-8~~	~~3.5~~	~~25~~	~~700~~	~~700~~	~~NNS~~	~~NNS~~
~~Acrylonitrile~~	~~107-13-1~~	~~0.07~~	~~0.7~~	~~3~~	~~56,000~~	~~NNS~~	~~NNS~~
~~Alachlor~~	~~15972-60-8~~	~~2~~	~~NNS~~	~~14,000~~	~~14,000~~	~~NNS~~	~~NNS~~
~~Aldrin~~	~~309-00-2~~	~~0.002~~	~~0.0001~~	~~0.08~~	~~42~~	~~p~~	~~p~~
~~Ammonia~~	~~7664-41-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Anthracene~~	~~120-12-7~~	~~2100~~	~~1000~~	~~420,000~~	~~420,000~~	~~NNS~~	~~NNS~~
~~Antimony (as Sb)~~	~~7440-36-0~~	~~6 T~~	~~4,300 T~~	~~560 T~~	~~560 T~~	~~NNS~~	~~NNS~~
~~Arsenic (as As)~~	~~7440-38-2~~	~~50 T~~	~~1450 T~~	~~50 T~~	~~420 T~~	~~2000 T~~	~~200 T~~
~~Asbestos~~	~~1332-21-4~~	~~a~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Atrazine~~	~~1912-24-9~~	~~3~~	~~NNS~~	~~49,000~~	~~49,000~~	~~NNS~~	~~NNS~~
~~Barium (as Ba)~~	~~7440-39-3~~	~~2000 T~~	~~NNS~~	~~98,000 T~~	~~98,000 T~~	~~NNS~~	~~NNS~~
~~Benzene~~	~~71-43-2~~	~~5~~	~~140~~	~~93~~	~~93~~	~~NNS~~	~~NNS~~
~~Benzidine~~	~~92-87-5~~	~~0.0002~~	~~0.001~~	~~0.01~~	~~4,200~~	~~0.01~~	~~0.01~~
~~Benz (a) anthracene~~	~~56-55-3~~	~~0.048~~	~~0.49~~	~~1.9~~	~~1.9~~	~~NNS~~	~~NNS~~
~~Benzo (a) pyrene~~	~~50-32-8~~	~~0.2~~	~~0.05~~	~~0.2~~	~~0.2~~	~~NNS~~	~~NNS~~
~~Benzo (ghi) perylene~~	~~191-24-2~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Benzo (k) fluoranthene~~	~~207-08-9~~	~~0.048~~	~~0.49~~	~~1.9~~	~~1.9~~	~~NNS~~	~~NNS~~
~~3,4 Benzofluoranthene~~	~~205-99-2~~	~~0.048~~	~~0.49~~	~~1.9~~	~~1.9~~	~~NNS~~	~~NNS~~
~~Beryllium (as Be)~~	~~7440-41-7~~	~~4 T~~	~~1,130 T~~	~~2,800 T~~	~~2,800 T~~	~~NNS~~	~~NNS~~
~~Bis (2-chloroethoxy) methane~~	~~111-91-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~

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~~Bis (2-chloroethyl) ether~~	~~111-44-4~~	~~0.03~~	~~1.4~~	~~1.3~~	~~1.3~~	~~NNS~~	~~NNS~~
~~Bis (2-chloroisopropyl) ether~~	~~108-60-1~~	~~280~~	~~174,400~~	~~56,000~~	~~56,000~~	~~NNS~~	~~NNS~~
~~Boron (as B)~~	~~7440-42-8~~	~~630 T~~	~~NNS~~	~~126,000 T~~	~~126,000 T~~	~~1000 T~~	~~NNS~~
~~Bromodichloromethane~~	~~75-27-4~~	~~TTHM~~	~~46~~	~~TTHM~~	~~28,000~~	~~NNS~~	~~NNS~~
~~p-Bromodiphenyl ether~~	~~101-55-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Bromoform~~	~~75-25-2~~	~~TTHM~~	~~360~~	~~180~~	~~28,000~~	~~NNS~~	~~NNS~~
~~Bromomethane~~	~~74-83-9~~	~~9.8~~	~~4020~~	~~2000~~	~~2000~~	~~NNS~~	~~NNS~~
~~Butyl benzyl phthalate~~	~~85-68-7~~	~~1400~~	~~5200~~	~~280,000~~	~~280,000~~	~~NNS~~	~~NNS~~
~~Cadmium (as Cd)~~	~~7440-43-9~~	~~5 T~~	~~84 T~~	~~700 T~~	~~700 T~~	~~50 T~~	~~50 T~~
~~Carbofuran~~	~~1563-66-2~~	~~40~~	~~NNS~~	~~7,000~~	~~7,000~~	~~NNS~~	~~NNS~~
~~Carbon tetrachloride~~	~~56-23-5~~	~~5~~	~~4~~	~~11~~	~~980~~	~~NNS~~	~~NNS~~
~~Chlordane~~	~~57-74-9~~	~~2~~	~~0.002~~	~~4~~	~~700~~	~~NNS~~	~~NNS~~
~~Chlorine (total residual)~~	~~7782-50-5~~	~~700~~	~~NNS~~	~~140,000~~	~~140,000~~	~~NNS~~	~~NNS~~
~~Chlorobenzene~~	~~108-90-7~~	~~100~~	~~20,900~~	~~28,000~~	~~28,000~~	~~NNS~~	~~NNS~~
~~p-Chloro-m-cresol~~	~~59-50-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~2-Chloroethyl vinyl ether~~	~~110-75-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Chloroform~~	~~67-66-3~~	~~TTHM~~	~~470~~	~~230~~	~~14,000~~	~~NNS~~	~~NNS~~
~~Chloromethane~~	~~74-87-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Chloronapthalene beta~~	~~91-58-7~~	~~560~~	~~4,300~~	~~112,000~~	~~112,000~~	~~NNS~~	~~NNS~~
~~2-Chlorophenol~~	~~95-57-8~~	~~35~~	~~400~~	~~7,000~~	~~7,000~~	~~NNS~~	~~NNS~~
~~4-Chlorophenyl phenyl ether~~	~~7005-72-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Chromium (as Cr III)~~	~~16065-83-1~~	~~10,500 T~~	~~1,010,000 T~~	~~2,100,000 T~~	~~2,100,000 T~~	~~NNS~~	~~NNS~~
~~Chromium (as Cr VI)~~	~~18540-29-9~~	~~21 T~~	~~2,000T~~	~~4,200 T~~	~~4,200 T~~	~~NNS~~	~~NNS~~
~~Chromium (Total as Cr)~~	~~7440-47-3~~	~~100 T~~	~~NNS~~	~~100 T~~	~~100 T~~	~~1000 T~~	~~1000 T~~
~~Chrysene~~	~~218-01-9~~	~~0.479~~	~~4.92~~	~~19.2~~	~~19~~	~~NNS~~	~~NNS~~
~~Copper (as Cu)~~	~~7440-50-8~~	~~1,300 T~~	~~NNS~~	~~1,300 T~~	~~1,300 T~~	~~5000 T~~	~~500 T~~
~~Cyanide~~	~~57-12-5~~	~~200 T~~	~~215,000 T~~	~~28,000 T~~	~~28,000 T~~	~~NNS~~	~~200 T~~
~~Dalapon~~	~~75-99-0~~	~~200~~	~~161,500~~	~~42,000~~	~~42,000~~	~~NNS~~	~~NNS~~
~~Dibenz (ah) anthracene~~	~~53-70-3~~	~~0.048~~	~~0.20~~	~~1.9~~	~~1.9~~	~~NNS~~	~~NNS~~
~~Dibromochloromethane~~	~~124-48-1~~	~~TTHM~~	~~34~~	~~TTHM~~	~~28,000~~	~~NNS~~	~~NNS~~
~~1,2-Dibromo-3-chloropropane (DBCP)~~	~~96-12-8~~	~~0.2~~	~~NNS~~	~~2,800~~	~~2,800~~	~~NNS~~	~~NNS~~
~~1,2-Dibromoethane (EDB)~~	~~106-93-4~~	~~0.05~~	~~NNS~~	~~0.05~~	~~0.05~~	~~NNS~~	~~NNS~~
~~Dibutyl phthalate~~	~~84-74-2~~	~~700~~	~~12,100~~	~~140,000~~	~~140,000~~	~~NNS~~	~~NNS~~
~~1,2-Dichlorobenzene~~	~~95-50-1~~	~~600~~	~~2800~~	~~126,000~~	~~126,000~~	~~NNS~~	~~NNS~~
~~1,3-Dichlorobenzene~~	~~541-73-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,4-Dichlorobenzene~~	~~106-46-7~~	~~75~~	~~77,500~~	~~560,000~~	~~560,000~~	~~NNS~~	~~NNS~~
~~3,3'-Dichlorobenzidine~~	~~91-94-1~~	~~0.08~~	~~0.08~~	~~3.1~~	~~3.1~~	~~NNS~~	~~NNS~~

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~~p,p'-Dichlorodiphenyldichloroethane (DDD)~~	~~72-54-8~~	~~0.15~~	~~0.001~~	~~5.8~~	~~5.8~~	~~0.001~~	~~0.001~~
~~p,p'-Dichlorodiphenyldichloroethylene (DDE)~~	~~72-55-9~~	~~0.1~~	~~0.001~~	~~4.1~~	~~4.1~~	~~0.001~~	~~0.001~~
~~p,p'-Dichlorodiphenyltrichloroethane (DDT)~~	~~50-29-3~~	~~0.1~~	~~0.0006~~	~~4.1~~	~~700~~	~~0.001~~	~~0.001~~
~~1,1-Dichloroethane~~	~~75-34-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,2-Dichloroethane~~	~~107-06-2~~	~~5~~	~~100~~	~~15~~	~~280,000~~	~~NNS~~	~~NNS~~
~~1,1-Dichloroethylene~~	~~75-35-4~~	~~7~~	~~320~~	~~230~~	~~12,600~~	~~NNS~~	~~NNS~~
~~1,2-cis-Dichloroethylene~~	~~156-59-2~~	~~70~~	~~NNS~~	~~70~~	~~70~~	~~NNS~~	~~NNS~~
~~1,2-trans-Dichloroethylene~~	~~156-60-5~~	~~100~~	~~136,000~~	~~28,000~~	~~28,000~~	~~NNS~~	~~NNS~~
~~Dichloromethane~~	~~75-09-2~~	~~5~~	~~1600~~	~~190~~	~~84,000~~	~~NNS~~	~~NNS~~
~~2,4-Dichlorophenol~~	~~120-83-2~~	~~21~~	~~800~~	~~4,200~~	~~4,200~~	~~NNS~~	~~NNS~~
~~2,4-Dichlorophenoxyacetic acid (2,4-D)~~	~~94-75-7~~	~~70~~	~~NNS~~	~~14,000~~	~~14,000~~	~~NNS~~	~~NNS~~
~~1,2-Dichloropropane~~	~~78-87-5~~	~~5~~	~~236,000~~	~~126,000~~	~~126,000~~	~~NNS~~	~~NNS~~
~~1,3-Dichloropropene~~	~~542-75-6~~	~~2~~	~~1,700~~	~~420~~	~~420~~	~~NNS~~	~~NNS~~
~~Dieldrin~~	~~60-57-1~~	~~0.002~~	~~0.0001~~	~~0.09~~	~~70~~	~~p~~	~~p~~
~~Diethyl phthalate~~	~~84-66-2~~	~~5600~~	~~118,000~~	~~1,120,000~~	~~1,120,000~~	~~NNS~~	~~NNS~~
~~Di (2-ethylhexyl) adipate~~	~~103-23-1~~	~~400~~	~~NNS~~	~~1,200~~	~~840,000~~	~~NNS~~	~~NNS~~
~~Di (2-ethylhexyl) phthalate~~	~~117-81-7~~	~~6~~	~~7.4~~	~~100~~	~~28,000~~	~~NNS~~	~~NNS~~
~~2,4-Dimethylphenol~~	~~105-67-9~~	~~140~~	~~2300~~	~~28,000~~	~~28,000~~	~~NNS~~	~~NNS~~
~~Dimethyl phthalate~~	~~131-11-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~4,6-Dinitro-o-cresol~~	~~534-52-1~~	~~28~~	~~7,800~~	~~5,600~~	~~5,600~~	~~NNS~~	~~NNS~~
~~2,4-Dinitrophenol~~	~~51-28-5~~	~~14~~	~~14,400~~	~~2,800~~	~~2,800~~	~~NNS~~	~~NNS~~
~~2,4-Dinitrotoluene~~	~~121-14-2~~	~~14~~	~~5,700~~	~~2,800~~	~~2,800~~	~~NNS~~	~~NNS~~
~~2,6-Dinitrotoluene~~	~~606-20-2~~	~~0.05~~	~~NNS~~	~~2~~	~~5,600~~	~~NNS~~	~~NNS~~
~~Di-n-octyl phthalate~~	~~117-84-0~~	~~2800~~	~~NNS~~	~~560,000~~	~~560,000~~	~~NNS~~	~~NNS~~
~~Dinoseb~~	~~88-85-7~~	~~7~~	~~NNS~~	~~1,400~~	~~1,400~~	~~NNS~~	~~NNS~~
~~1,2-Diphenylhydrazine~~	~~122-66-7~~	~~0.04~~	~~0.5~~	~~1.8~~	~~1.8~~	~~NNS~~	~~NNS~~
~~Diquat~~	~~85-00-7~~	~~20~~	~~NNS~~	~~3,080~~	~~3,080~~	~~NNS~~	~~NNS~~
~~Endosulfan sulfate~~	~~1031-07-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Endosulfan (Total)~~	~~115-29-7~~	~~42~~	~~240~~	~~8,400~~	~~8,400~~	~~NNS~~	~~NNS~~
~~Endothall~~	~~145-73-3~~	~~100~~	~~NNS~~	~~28,000~~	~~28,000~~	~~NNS~~	~~NNS~~
~~Endrin~~	~~72-20-8~~	~~2~~	~~0.8~~	~~420~~	~~420~~	~~0.004~~	~~0.004~~
~~Endrin aldehyde~~	~~7421-93-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Ethylbenzene~~	~~100-41-4~~	~~700~~	~~28,700~~	~~140,000~~	~~140,000~~	~~NNS~~	~~NNS~~
~~Ethyl chloride~~	~~75-00-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Fluoranthene~~	~~206-44-0~~	~~280~~	~~380~~	~~56,000~~	~~56,000~~	~~NNS~~	~~NNS~~
~~Fluorene~~	~~86-73-7~~	~~280~~	~~14,400~~	~~56,000~~	~~56,000~~	~~NNS~~	~~NNS~~
~~Fluoride~~	~~7782-41-4~~	~~4000~~	~~NNS~~	~~84,000~~	~~84,000~~	~~NNS~~	~~NNS~~
~~Glyphosate~~	~~1071-83-6~~	~~700~~	~~1,077,000~~	~~140,000~~	~~140,000~~	~~NNS~~	~~NNS~~
~~Heptachlor~~	~~76-44-8~~	~~0.4~~	~~0.0002~~	~~0.4~~	~~700~~	~~NNS~~	~~NNS~~

~~**Appendix A: Numeric Water Quality Criteria**~~
~~**Table 1. Human Health and Agricultural Designated Uses**~~

~~**PARAMETER**~~	~~**CAS* NUMBER**~~	~~**DWS (µg/L)**~~	~~**FC (µg/L)**~~	~~**FBC (µg/L)**~~	~~**PBC (µg/L)**~~	~~**AgI (µg/L)**~~	~~**AgL (µg/L)**~~
~~Heptachlor epoxide~~	~~1024-57-3~~	~~0.2~~	~~0.0001~~	~~0.2~~	~~18~~	~~NNS~~	~~NNS~~
~~Hexachlorobenzene~~	~~118-74-1~~	~~1~~	~~0.001~~	~~1~~	~~1,120~~	~~NNS~~	~~NNS~~
~~Hexachlorobutadiene~~	~~87-68-3~~	~~0.45~~	~~50~~	~~18~~	~~280~~	~~NNS~~	~~NNS~~
~~Hexachlorocyclohexane alpha~~	~~319-84-6~~	~~0.006~~	~~0.01~~	~~0.22~~	~~11,200~~	~~NNS~~	~~NNS~~
~~Hexachlorocyclohexane beta~~	~~319-85-7~~	~~0.02~~	~~0.02~~	~~0.78~~	~~840~~	~~NNS~~	~~NNS~~
~~Hexachlorocyclohexane delta~~	~~319-86-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Hexachlorocyclohexane gamma (lindane)~~	~~58-89-9~~	~~0.2~~	~~25~~	~~420~~	~~420~~	~~NNS~~	~~NNS~~
~~Hexachlorocyclopentadiene~~	~~77-47-4~~	~~50~~	~~580~~	~~9,800~~	~~9,800~~	~~NNS~~	~~NNS~~
~~Hexachloroethane~~	~~67-72-1~~	~~2.5~~	~~9~~	~~100~~	~~1,400~~	~~NNS~~	~~NNS~~
~~Indeno (1,2,3-cd) pyrene~~	~~193-39-5~~	~~0.048~~	~~0.49~~	~~1.9~~	~~1.9~~	~~NNS~~	~~NNS~~
~~Isophorone~~	~~78-59-1~~	~~37~~	~~2,600~~	~~1,500~~	~~280,000~~	~~NNS~~	~~NNS~~
~~Lead (as Pb)~~	~~7439-97-1~~	~~15 T~~	~~NNS~~	~~15 T~~	~~15 T~~	~~10000 T~~	~~100 T~~
~~Manganese (as Mn)~~	~~7439-96-5~~	~~980 T~~	~~NNS~~	~~196,000 T~~	~~196,000 T~~	~~10000~~	~~NNS~~
~~Mercury (as Hg)~~	~~7439-97-6~~	~~2 T~~	~~0.6 T~~	~~420 T~~	~~420 T~~	~~NNS~~	~~10 T~~
~~Methoxychlor~~	~~72-43-5~~	~~40~~	~~NNS~~	~~7,000~~	~~7,000~~	~~NNS~~	~~NNS~~
~~Naphthalene~~	~~91-20-3~~	~~140~~	~~20,500~~	~~28,000~~	~~28,000~~	~~NNS~~	~~NNS~~
~~Nickel (as Ni)~~	~~7440-02-0~~	~~140 T~~	~~4,600 T~~	~~28,000 T~~	~~28,000 T~~	~~NNS~~	~~NNS~~
~~Nitrate (as N)~~	~~14797-55-8~~	~~10000~~	~~NNS~~	~~2,240,000~~	~~2,240,000~~	~~NNS~~	~~NNS~~
~~Nitrite (as N)~~	~~14797-65-0~~	~~1000~~	~~NNS~~	~~140,000~~	~~140,000~~	~~NNS~~	~~NNS~~
~~Nitrate/Nitrite (as Total N)~~		~~10000~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Nitrobenzene~~	~~98-95-3~~	~~3.5~~	~~1,900~~	~~700~~	~~700~~	~~NNS~~	~~NNS~~
~~o-Nitrophenol~~	~~88-75-5~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~p-Nitrophenol~~	~~100-02-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~N-nitrosodimethylamine~~	~~62-75-9~~	~~0.001~~	~~8~~	~~0.03~~	~~0.03~~	~~NNS~~	~~NNS~~
~~N-nitrosodiphenylamine~~	~~86-30-6~~	~~7.1~~	~~16~~	~~290~~	~~290~~	~~NNS~~	~~NNS~~
~~N-nitrosodi-n-propylamine~~	~~621-64-7~~	~~0.005~~	~~1.4~~	~~0.2~~	~~133,000~~	~~NNS~~	~~NNS~~
~~Oxamyl~~	~~23135-22-0~~	~~200~~	~~NNS~~	~~35,000~~	~~35,000~~	~~NNS~~	~~NNS~~
~~Pentachlorophenol~~	~~87-86-5~~	~~1~~	~~1000~~	~~12~~	~~42,000~~	~~NNS~~	~~NNS~~
~~Phenanthrene~~	~~85-01-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Phenol~~	~~108-95-2~~	~~4200~~	~~1,000~~	~~840,000~~	~~840,000~~	~~NNS~~	~~NNS~~
~~Picloram~~	~~1918-02-1~~	~~500~~	~~24,300~~	~~98,000~~	~~98,000~~	~~NNS~~	~~NNS~~
~~Polychlorinatedbiphenyls (PCBs)~~	~~1336-36-3~~	~~0.5~~	~~0.007~~	~~28~~	~~28~~	~~0.001~~	~~0.001~~
~~Pyrene~~	~~129-00-0~~	~~210~~	~~10,800~~	~~42,000~~	~~42,000~~	~~NNS~~	~~NNS~~
~~Selenium (as Se)~~	~~7782-49-2~~	~~50 T~~	~~9000 T~~	~~7,000 T~~	~~7,000 T~~	~~20 T~~	~~50 T~~
~~Silver (as Ag)~~	~~7440-22-4~~	~~35 T~~	~~107,700 T~~	~~7,000 T~~	~~7,000 T~~	~~NNS~~	~~NNS~~
~~Simazine~~	~~112-34-9~~	~~4~~	~~NNS~~	~~7,000~~	~~7,000~~	~~NNS~~	~~NNS~~
~~Styrene~~	~~100-42-5~~	~~100~~	~~NNS~~	~~280,000~~	~~280,000~~	~~NNS~~	~~NNS~~
~~Sulfides~~		~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~

~~**Appendix A: Numeric Water Quality Criteria**~~
~~**Table 1. Human Health and Agricultural Designated Uses**~~

~~PARAMETER~~	~~CAS* NUMBER~~	~~DWS (µg/L)~~	~~FC (µg/L)~~	~~FBC (µg/L)~~	~~PBC (µg/L)~~	~~AgI (µg/L)~~	~~AgL (µg/L)~~
~~2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)~~	~~1746-01-6~~	~~0.0000003~~	~~0.000000004~~	~~0.00009~~	~~1.4~~	~~NNS~~	~~NNS~~
~~1,1,2,2-Tetrachloroethane~~	~~79-34-5~~	~~0.17~~	~~11~~	~~7~~	~~56,000~~	~~NNS~~	~~NNS~~
~~Tetrachloroethylene~~	~~127-18-4~~	~~5~~	~~3,500~~	~~14,000~~	~~14,000~~	~~NNS~~	~~NNS~~
~~Thallium (as Tl)~~	~~7440-28-0~~	~~2 T~~	~~7.2 T~~	~~112 T~~	~~112 T~~	~~NNS~~	~~NNS~~
~~Toluene~~	~~108-88-3~~	~~1000~~	~~201,000~~	~~280,000~~	~~280,000~~	~~NNS~~	~~NNS~~
~~Toxaphene~~	~~8001-35-2~~	~~3~~	~~0.001~~	~~1.3~~	~~1400~~	~~0.005~~	~~0.005~~
~~1,2,4-Trichlorobenzene~~	~~120-82-1~~	~~70~~	~~950~~	~~14,000~~	~~14,000~~	~~NNS~~	~~NNS~~
~~1,1,1-Trichloroethane~~	~~71-55-6~~	~~200~~	~~NNS~~	~~200~~	~~200~~	~~1000~~	~~NNS~~
~~1,1,2-Trichloroethane~~	~~79-00-5~~	~~5~~	~~42~~	~~25~~	~~5,600~~	~~NNS~~	~~NNS~~
~~Trichloroethylene~~	~~79-01-6~~	~~5~~	~~203,200~~	~~280,000~~	~~280,000~~	~~NNS~~	~~NNS~~
~~2,4,6-Trichlorophenol~~	~~88-06-2~~	~~3.2~~	~~6.5~~	~~130~~	~~130~~	~~NNS~~	~~NNS~~
~~2-(2,4,5-Trichlorophenoxy)-proprionic acid (2,4,5-TP)~~	~~93-72-1~~	~~50~~	~~NNS~~	~~11,200~~	~~11,200~~	~~NNS~~	~~NNS~~
~~Trihalomethanes, Total~~		~~100~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Uranium (as Ur)~~	~~7440-61-1~~	~~35 D~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Vinyl chloride~~	~~75-01-4~~	~~2~~	~~13~~	~~2~~	~~4,200~~	~~NNS~~	~~NNS~~
~~Xylenes (Total)~~	~~1330-20-7~~	~~10000~~	~~NNS~~	~~2,800,000~~	~~2,800,000~~	~~NNS~~	~~NNS~~
~~Zinc (as Zn)~~	~~7440-66-6~~	~~2100 T~~	~~69,000 T~~	~~420,000 T~~	~~420,000 T~~	~~10000 T~~	~~25000 T~~

~~**Appendix A: Numeric Water Quality Criteria**~~
~~**Table 2. Aquatic & Wildlife Designated Uses**~~

~~PARAMETER~~	~~CAS NUMBER~~	~~A&We Acute (µg/L)~~	~~A&We Chronic (µg/L)~~	~~A&Ww Acute (µg/L)~~	~~A&Ww Chronic (µg/L)~~	~~A&Wedw Acute (µg/L)~~	~~A&Wedw Chronic (µg/L)~~	~~A&We Acute (µg/L)~~
~~Acenaphthene~~	~~83-32-9~~	~~850~~	~~550~~	~~850~~	~~550~~	~~850~~	~~550~~	~~NNS~~
~~Acenaphthylene~~	~~208-96-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Acrolein~~	~~107-02-8~~	~~34~~	~~30~~	~~34~~	~~30~~	~~34~~	~~30~~	~~NNS~~
~~Acrylonitrile~~	~~107-13-1~~	~~3800~~	~~250~~	~~3800~~	~~250~~	~~3800~~	~~250~~	~~NNS~~
~~Alachlor~~	~~15972-60-8~~	~~2500~~	~~170~~	~~2500~~	~~170~~	~~2500~~	~~170~~	~~NNS~~
~~Aldrin~~	~~309-00-2~~	~~2.0~~	~~NNS~~	~~2.0~~	~~NNS~~	~~2.0~~	~~NNS~~	~~4.5~~
~~Ammonia~~	~~7664-41-7~~	~~b~~	~~b~~	~~b~~	~~b~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Anthracene~~	~~120-12-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Antimony (as Sb)~~	~~7440-36-0~~	~~88 D~~	~~30 D~~	~~88 D~~	~~30 D~~	~~1000 D~~	~~600 D~~	~~NNS~~
~~Arsenic (as As)~~	~~7440-38-2~~	~~360 D~~	~~190 D~~	~~360 D~~	~~190 D~~	~~360 D~~	~~190 D~~	~~440 D~~
~~Asbestos~~	~~1332-21-4~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Atrazine~~	~~1912-24-9~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Barium (as Ba)~~	~~7440-39-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Benzene~~	~~71-43-2~~	~~2700~~	~~180~~	~~2700~~	~~180~~	~~8800~~	~~560~~	~~NNS~~
~~Benzidine~~	~~92-87-5~~	~~1300~~	~~89~~	~~1300~~	~~89~~	~~1300~~	~~89~~	~~10000~~
~~Benz (a) anthracene~~	~~56-55-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Benzo (a) pyrene~~	~~50-32-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Benzo (ghi) perylene~~	~~191-24-2~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Benzo (k) fluoranthene~~	~~207-08-9~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~3,4-Benzofluoranthene~~	~~205-99-2~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~

~~Beryllium (as Be)~~	~~7440-41-7~~	~~65 D~~	~~5.3 D~~	~~65 D~~	~~5.3 D~~	~~65 D~~	~~5.3 D~~	~~NNS~~
~~Bis (2-chloroethoxy) methane~~	~~111-91-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Bis (2-chlorethyl) ether~~	~~111-44-4~~	~~120000~~	~~6700~~	~~120000~~	~~6700~~	~~120000~~	~~6700~~	~~NNS~~
~~Bis (2-chloroisopropyl) ether~~	~~108-60-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Boron (as B)~~	~~7440-42-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Bromodichloromethane~~	~~75-27-4~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~p-Bromodiphenyl ether~~	~~101-55-3~~	~~180~~	~~14~~	~~180~~	~~14~~	~~180~~	~~14~~	~~NNS~~
~~Bromoform~~	~~75-25-2~~	~~15000~~	~~10000~~	~~15000~~	~~10000~~	~~15000~~	~~10000~~	~~NNS~~
~~Bromomethane~~	~~74-83-9~~	~~5500~~	~~360~~	~~5500~~	~~360~~	~~5500~~	~~360~~	~~NNS~~
~~Butyl benzyl phthalate~~	~~85-68-7~~	~~1700~~	~~130~~	~~1700~~	~~130~~	~~1700~~	~~130~~	~~NNS~~
~~Cadmium (as Cd)~~	~~7440-43-9~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~
~~Carbofuran~~	~~1563-66-2~~	~~650~~	~~50~~	~~650~~	~~50~~	~~650~~	~~50~~	~~NNS~~
~~Carbon tetrachloride~~	~~56-23-5~~	~~18000~~	~~1100~~	~~18000~~	~~1100~~	~~18000~~	~~1100~~	~~NNS~~
~~Chlordane~~	~~57-74-9~~	~~2.4~~	~~0.004~~	~~2.4~~	~~0.21~~	~~2.4~~	~~0.21~~	~~3.2~~
~~Chlorine (total residual)~~	~~7782-50-5~~	~~11~~	~~5.0~~	~~11~~	~~5.0~~	~~11~~	~~5.0~~	~~NNS~~
~~Chlorobenzene~~	~~108-90-7~~	~~3800~~	~~260~~	~~3800~~	~~260~~	~~3800~~	~~260~~	~~NNS~~
~~p-Chloro-m-cresol~~	~~59-50-7~~	~~15~~	~~4.7~~	~~15~~	~~4.7~~	~~15~~	~~4.7~~	~~48000~~
~~2-Chloroethyl vinyl ether~~	~~110-75-8~~	~~180000~~	~~9800~~	~~180000~~	~~9800~~	~~180000~~	~~9800~~	~~NNS~~
~~Chloroform~~	~~67-66-3~~	~~14000~~	~~900~~	~~14000~~	~~900~~	~~14000~~	~~900~~	~~NNS~~
~~Chloromethane~~	~~74-87-3~~	~~270000~~	~~15000~~	~~270000~~	~~15000~~	~~270000~~	~~15000~~	~~NNS~~
~~Chloronapthalene beta~~	~~91-58-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~2-Chlorophenol~~	~~95-57-8~~	~~2200~~	~~150~~	~~2200~~	~~150~~	~~2200~~	~~150~~	~~NNS~~
~~4-Chlorophenyl phenyl ether~~	~~7005-72-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Chromium (as Cr III)~~	~~16065-83-1~~	~~d D~~	~~d D~~	~~d D~~	~~d D~~	~~d D~~	~~d D~~	~~d D~~
~~Chromium (as Cr VI)~~	~~18540-29-9~~	~~16 D~~	~~11 D~~	~~16 D~~	~~11 D~~	~~16 D~~	~~11 D~~	~~34 D~~
~~Chromium (Total as Cr)~~	~~7440-47-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Chrysene~~	~~218-01-9~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Copper (as Cu)~~	~~7440-50-8~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~	~~e D~~
~~Cyanide~~	~~57-12-5~~	~~22 T~~	~~5.2 T~~	~~41 T~~	~~9.7 T~~	~~41 T~~	~~9.7 T~~	~~84 T~~
~~Dibenz (ah) anthracene~~	~~53-70-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Dibromochloromethane~~	~~124-48-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,2-Dibromo-3-chloropropane (DBCP)~~	~~96-12-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,2-Dibromoethane (EDB)~~	~~106-93-4~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Dibutyl phthalate~~	~~84-74-2~~	~~470~~	~~35~~	~~470~~	~~35~~	~~470~~	~~35~~	~~1100~~
~~1,2-Dichlorobenzene~~	~~95-50-1~~	~~790~~	~~300~~	~~1200~~	~~470~~	~~1200~~	~~470~~	~~5900~~
~~1,3-Dichlorobenzene~~	~~541-73-1~~	~~2500~~	~~970~~	~~2500~~	~~970~~	~~2500~~	~~970~~	~~NNS~~
~~1,4-Dichlorobenzene~~	~~106-46-7~~	~~560~~	~~210~~	~~2000~~	~~780~~	~~2000~~	~~780~~	~~6500~~
~~3,3'-Dichlorobenzidine~~	~~91-94-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~p,p'-Dichlorodiphenyldichloroethane (DDD)~~	~~72-54-8~~	~~1.1~~	~~0.001~~	~~1.1~~	~~0.02~~	~~1.1~~	~~0.02~~	~~1.1~~
~~p,p'-Dichlorodiphenyldichloroethylene (DDE)~~	~~72-55-9~~	~~1.1~~	~~0.001~~	~~1.1~~	~~0.02~~	~~1.1~~	~~0.02~~	~~1.1~~
~~p,p'-Dichlorodiphenyltrichloroethane (DDT)~~	~~50-29-3~~	~~1.1~~	~~0.001~~	~~1.1~~	~~0.001~~	~~1.1~~	~~0.001~~	~~1.1~~
~~1,1-Dichloroethane~~	~~75-34-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,2-Dichloroethane~~	~~107-06-2~~	~~59000~~	~~41000~~	~~59000~~	~~41000~~	~~59000~~	~~41000~~	~~NNS~~
~~1,1-Dichloroethylene~~	~~75-35-4~~	~~15000~~	~~950~~	~~15000~~	~~950~~	~~15000~~	~~950~~	~~NNS~~
~~1,2-cis-Dichloroethylene~~	~~156-59-2~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,2-trans-Dichloroethylene~~	~~156-60-5~~	~~68000~~	~~3900~~	~~68000~~	~~3900~~	~~68000~~	~~3900~~	~~NNS~~
~~Dichloromethane~~	~~75-09-2~~	~~97000~~	~~5500~~	~~97000~~	~~5500~~	~~97000~~	~~5500~~	~~NNS~~
~~2,4-Dichlorophenol~~	~~120-83-2~~	~~1000~~	~~88~~	~~1000~~	~~88~~	~~1000~~	~~88~~	~~NNS~~

~~2,4-Dichlorophenoxyacetic acid (2,4-D)~~	~~94-75-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,2-Dichloropropane~~	~~78-87-5~~	~~26000~~	~~9200~~	~~26000~~	~~9200~~	~~26000~~	~~9200~~	~~NNS~~
~~1,3-Dichloropropene~~	~~542-75-6~~	~~3000~~	~~1100~~	~~3000~~	~~1100~~	~~3000~~	~~1100~~	~~NNS~~
~~Dieldrin~~	~~60-57-1~~	~~2.5~~	~~0.002~~	~~2.5~~	~~0.002~~	~~2.5~~	~~0.005~~	~~4~~
~~Diethyl phthalate~~	~~84-66-2~~	~~26000~~	~~1600~~	~~26000~~	~~1600~~	~~26000~~	~~1600~~	~~NNS~~
~~Di(2-ethylhexyl) phthalate~~	~~117-81-7~~	~~400~~	~~360~~	~~400~~	~~360~~	~~400~~	~~360~~	~~3100~~
~~2,4-Dimethylphenol~~	~~105-67-9~~	~~1000~~	~~310~~	~~1000~~	~~310~~	~~1100~~	~~310~~	~~150000~~
~~Dimethyl phthalate~~	~~131-11-3~~	~~17000~~	~~1000~~	~~17000~~	~~1000~~	~~17000~~	~~1000~~	~~NNS~~
~~4,6-Dinitro-o-cresol~~	~~534-52-1~~	~~310~~	~~24~~	~~310~~	~~24~~	~~310~~	~~24~~	~~NNS~~
~~2,4-Dinitrophenol~~	~~51-28-5~~	~~110~~	~~9.2~~	~~110~~	~~9.2~~	~~110~~	~~9.2~~	~~NNS~~
~~2,4-Dinitrotoluene~~	~~121-14-2~~	~~14000~~	~~860~~	~~14000~~	~~860~~	~~14000~~	~~860~~	~~NNS~~
~~2,6-Dinitrotoluene~~	~~606-20-2~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~-Di-n-octyl phthalate~~	~~117-84-0~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,2-Diphenylhydrazine~~	~~122-66-7~~	~~130~~	~~11~~	~~130~~	~~11~~	~~130~~	~~11~~	~~NNS~~
~~Endosulfan sulfate~~	~~1031-07-8~~	~~0.22~~	~~0.06~~	~~0.22~~	~~0.06~~	~~0.22~~	~~0.06~~	~~3.0~~
~~Endosulfan (Total)~~	~~115-29-7~~	~~0.22~~	~~0.06~~	~~0.22~~	~~0.06~~	~~0.22~~	~~0.06~~	~~3.0~~
~~Endrin~~	~~72-20-8~~	~~0.18~~	~~0.002~~	~~0.2~~	~~0.08~~	~~0.2~~	~~0.08~~	~~0.7~~
~~Endrin aldehyde~~	~~7421-93-3~~	~~0.18~~	~~0.002~~	~~0.2~~	~~0.08~~	~~0.2~~	~~0.08~~	~~0.7~~
~~Ethylbenzene~~	~~100-41-4~~	~~23000~~	~~1400~~	~~23000~~	~~1400~~	~~23000~~	~~1400~~	~~NNS~~
~~Ethyl chloride~~	~~75-00-3~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Fluoranthene~~	~~206-44-0~~	~~2000~~	~~1600~~	~~2000~~	~~1600~~	~~2000~~	~~1600~~	~~NNS~~
~~Fluorene~~	~~86-73-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Fluorine~~	~~7782-41-4~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Heptachlor~~	~~76-44-8~~	~~0.52~~	~~0.004~~	~~0.52~~	~~0.004~~	~~0.58~~	~~0.013~~	~~0.9~~
~~Heptachlor epoxide~~	~~1024-57-3~~	~~0.52~~	~~0.004~~	~~0.52~~	~~0.004~~	~~0.58~~	~~0.013~~	~~0.9~~
~~Hexachlorobenzene~~	~~118-74-1~~	~~6.0~~	~~3.7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Hexachlorobutadiene~~	~~87-68-3~~	~~45~~	~~8.2~~	~~45~~	~~8.2~~	~~45~~	~~8.2~~	~~NNS~~
~~Hexachlorocyclohexane alpha~~	~~319-84-6~~	~~1600~~	~~130~~	~~1600~~	~~130~~	~~1600~~	~~130~~	~~1600~~
~~Hexachlorocyclohexane beta~~	~~319-85-7~~	~~1600~~	~~130~~	~~1600~~	~~130~~	~~1600~~	~~130~~	~~1600~~
~~Hexachlorocyclohexane delta~~	~~319-86-8~~	~~1600~~	~~130~~	~~1600~~	~~130~~	~~1600~~	~~130~~	~~1600~~
~~Hexachlorocyclohexane-gamma (lindane)~~	~~58-89-9~~	~~2.0~~	~~0.08~~	~~3.4~~	~~0.28~~	~~7.6~~	~~0.61~~	~~11~~
~~Hexachlorocyclopentadiene~~	~~77-47-4~~	~~3.5~~	~~0.3~~	~~3.5~~	~~0.3~~	~~3.5~~	~~0.3~~	~~NNS~~
~~Hexachloroethane~~	~~67-72-1~~	~~490~~	~~350~~	~~490~~	~~350~~	~~490~~	~~350~~	~~850~~
~~Indeno (1,2,3-cd) pyrene~~	~~193-39-5~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Isophorone~~	~~78-59-1~~	~~59000~~	~~43000~~	~~59000~~	~~43000~~	~~59000~~	~~43000~~	~~NNS~~
~~Lead (as Pb)~~	~~7439-97-1~~	~~f D~~	~~f D~~	~~f D~~	~~f D~~	~~f D~~	~~f D~~	~~f D~~
~~Manganese (as Mn)~~	~~7439-96-5~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Mercury (as Hg)~~	~~7439-97-6~~	~~2.4 D~~	~~0.01 D~~	~~2.4 D~~	~~0.01 D~~	~~2.6 D~~	~~0.2 D~~	~~5.0 D~~
~~Methoxychlor~~	~~72-43-5~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Naphthalene~~	~~91-20-3~~	~~1100~~	~~210~~	~~3200~~	~~580~~	~~3200~~	~~580~~	~~NNS~~
~~Nickel (as Ni)~~	~~7440-02-0~~	~~g D~~	~~g D~~	~~g D~~	~~g D~~	~~g D~~	~~g D~~	~~g D~~
~~Nitrate (as N)~~	~~14797-55-8~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Nitrite (as N)~~	~~14797-65-0~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Nitrate/Nitrite (as Total N)~~		~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Nitrobenzene~~	~~98-95-3~~	~~1300~~	~~850~~	~~1300~~	~~850~~	~~1300~~	~~850~~	~~NNS~~
~~o-Nitrophenol~~	~~88-75-5~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~p-Nitrophenol~~	~~100-02-7~~	~~4100~~	~~3000~~	~~4100~~	~~3000~~	~~4100~~	~~3000~~	~~NNS~~
~~N-nitrosodimethylamine~~	~~62-75-9~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~N-nitrosodiphenylamine~~	~~86-30-6~~	~~2900~~	~~200~~	~~2900~~	~~200~~	~~2900~~	~~200~~	~~NNS~~
~~N-nitrosodi-n-propylamine~~	~~621-64-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Pentachlorophenol~~	~~87-86-5~~	~~h~~	~~h~~	~~h~~	~~h~~	~~h~~	~~h~~	~~h~~
~~Phenanthrene~~	~~85-01-8~~	~~30~~	~~6.3~~	~~30~~	~~6.3~~	~~54~~	~~6.3~~	~~NNS~~

~~Phenol~~	~~108-95-2~~	~~5100~~	~~730~~	~~7000~~	~~1000~~	~~7000~~	~~1000~~	~~180000~~
~~Polychlorinatedbiphenyls (PCBs)~~	~~1336-36-3~~	~~2.0~~	~~0.01~~	~~2.0~~	~~0.02~~	~~2.0~~	~~0.02~~	~~11~~
~~Pyrene~~	~~129-00-0~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Selenium (as Se)~~	~~7782-49-2~~	~~20 T~~	~~2.0 T~~	~~20 T~~	~~2.0 T~~	~~50 T~~	~~2.0 T~~	~~33 T~~
~~Silver (as Ag)~~	~~7440-22-4~~	~~i D~~	~~NNS~~	~~i D~~	~~NNS~~	~~i D~~	~~NNS~~	~~i D~~
~~Styrene~~	~~100-42-5~~	~~5600~~	~~370~~	~~5600~~	~~370~~	~~5600~~	~~370~~	~~NNS~~
~~Sulfides n~~		~~100~~	~~NNS~~	~~100~~	~~NNS~~	~~100~~	~~NNS~~	~~100~~
~~2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)~~	~~1746-01-6~~	~~0.01~~	~~0.005~~	~~0.01~~	~~0.005~~	~~0.12~~	~~0.01~~	~~0.1~~
~~1,1,2,2-Tetrachloroethane~~	~~79-34-5~~	~~4700~~	~~3200~~	~~4700~~	~~3200~~	~~4700~~	~~3200~~	~~NNS~~
~~Tetrachloroethylene~~	~~127-18-4~~	~~2600~~	~~280~~	~~6500~~	~~680~~	~~6500~~	~~680~~	~~15000~~
~~Thallium (as Tl)~~	~~7440-28-0~~	~~700 D~~	~~150 D~~	~~700 D~~	~~150 D~~	~~700 D~~	~~150 D~~	~~NNS~~
~~Toluene~~	~~108-88-3~~	~~8700~~	~~180~~	~~8700~~	~~180~~	~~8700~~	~~180~~	~~NNS~~
~~Toxaphene~~	~~8001-35-2~~	~~0.73~~	~~0.0002~~	~~0.73~~	~~0.02~~	~~0.73~~	~~0.02~~	~~11~~
~~1,2,4-Trichlorobenzene~~	~~120-82-1~~	~~750~~	~~130~~	~~1700~~	~~300~~	~~NNS~~	~~NNS~~	~~NNS~~
~~1,1,1-Trichloroethane~~	~~71-55-6~~	~~2600~~	~~1600~~	~~2600~~	~~1600~~	~~2600~~	~~1600~~	~~NNS~~
~~1,1,2-Trichloroethane~~	~~79-00-5~~	~~18000~~	~~12000~~	~~18000~~	~~12000~~	~~18000~~	~~12000~~	~~NNS~~
~~Trichloroethylene~~	~~79-01-6~~	~~20000~~	~~1300~~	~~20000~~	~~1300~~	~~20000~~	~~1300~~	~~NNS~~
~~2,4,6-Trichlorophenol~~	~~88-06-2~~	~~160~~	~~25~~	~~160~~	~~25~~	~~160~~	~~25~~	~~3000~~
~~2-(2,4,5-Trichlorophenoxy) proprionic acid (2,4,5-TP)~~	~~93-72-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Trihalomethanes, Total~~		~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Uranium (as Ur)~~	~~7440-61-1~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Vinyl chloride~~	~~75-01-4~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Xylenes (Total)~~	~~1330-20-7~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~	~~NNS~~
~~Zinc (as Zn)~~	~~7440-66-6~~	~~j D~~	~~j D~~	~~j D~~	~~j D~~	~~j D~~	~~j D~~	~~j D~~

~~Footnotes~~

~~a. The standard to protect this use is 7 million fibers (longer than 10 micrometers) per liter.~~

~~b. Values for ammonia are contained in separate tables located at the end of Appendix A.~~

~~c. Cadmium~~

~~A&We acute standard: (e(1.128 [ln(Hardness)] - 3.6867)) * (1.136672-ln(hardness) * (0.041838))~~
~~A&We chronic standard: (e(0.7852 [ln(Hardness)] - 2.715)) * (1.101672-ln(hardness) * (0.041838))~~
~~A&Ww acute standard: (e(1.128 [ln(Hardness)] - 3.6867)) * (1.136672-ln(hardness) * (0.041838))~~
~~A&Ww chronic standard: (e(0.7852 [ln(Hardness)] - 2.715)) * (1.101672-ln(hardness) * (0.041838))~~
~~A&Wedw acute standard: (e(1.128 [ln(Hardness)] - 3.6867)) * (1.136672-ln(hardness) * (0.041838))~~
~~A&Wedw chronic standard: (e(0.7852 [ln(Hardness)] - 2.715)) * (1.101672-ln(hardness) * (0.041838))~~
~~A&We acute standard: (e(1.128 [ln(Hardness)] - 0.9691)) * (1.136672-ln(hardness) * (0.041838))~~
~~(See Footnote k)~~

~~d. Chromium III~~

~~A&We acute standard: (e(0.8190 [ln(Hardness)] + 3.7256)) * (0.316)~~
~~A&We chronic standard: (e(0.8190 [ln(Hardness)] + 0.6848)) * (0.86)~~
~~A&Ww acute standard: (e(0.8190 [ln(Hardness)] + 3.7256)) * (0.316)~~
~~A&Ww chronic standard: (e(0.8190 [ln(Hardness)] + 0.6848)) * (0.86)~~
~~A&Wedw acute standard: (e(0.8190 [ln(Hardness)] + 3.7256)) * (0.316)~~
~~A&Wedw chronic standard: (e(0.8190 [ln(Hardness)] + 0.6848)) * (0.86)~~
~~A&We acute standard: (e(0.8190 [ln(Hardness)] + 4.9361)) * (0.316)~~
~~(See Footnote k)~~

~~e. Copper~~

~~A&We acute standard: (e(0.9422 [ln(Hardness)] - 1.7)) * (0.96)~~
~~A&We chronic standard: (e(0.8545 [ln(Hardness)] - 1.702)) * (0.96)~~
~~A&Ww acute standard: (e(0.9422 [ln(Hardness)] - 1.7)) * (0.96)~~
~~A&Ww chronic standard: (e(0.8545 [ln(Hardness)] - 1.702)) * (0.96)~~
~~A&Wedw acute standard: (e(0.9422 [ln(Hardness)] - 1.7)) * (0.96)~~
~~A&Wedw chronic standard: (e(0.8545 [ln(Hardness)] - 1.702)) * (0.96)~~
~~A&We acute standard: (e(0.9422 [ln(Hardness)] - 1.1514)) * (0.96)~~
~~(See Footnote k)~~

~~f. Lead~~

~~A&We acute standard: (e(1.2730 [ln(Hardness)] - 1.460)) * (1.46203-ln(hardness) * (0.145712))~~
~~A&We chronic standard: (e(1.2730 [ln(Hardness)] - 4.705)) * (1.46203-ln(hardness) * (0.145712))~~
~~A&Ww acute standard: (e(1.2730 [ln(Hardness)] - 1.460)) * (1.46203-ln(hardness) * (0.145712))~~
~~A&Ww chronic standard: (e(1.2730 [ln(Hardness)] - 4.705)) * (1.46203-ln(hardness) * (0.145712))~~
~~A&Wedw acute standard: (e(1.2730 [ln(Hardness)] - 1.460)) * (1.46203-ln(hardness) * (0.145712))~~
~~A&Wedw chronic standard: (e(1.2730 [ln(Hardness)] - 4.705)) * (1.46203-ln(hardness) * (0.145712))~~
~~A&We acute standard: (e(1.2730 [ln(Hardness)] - 0.7131)) * (1.46203-ln(hardness) * (0.145712))~~
~~(See Footnote k)~~

~~g. Nickel~~
~~A&We acute standard: (e(0.8460 [ln(Hardness)] + 2.255)) * (0.998)~~
~~A&We chronic standard: (e(0.8460 [ln(Hardness)] + 0.0584)) * (0.997)~~
~~A&Ww acute standard: (e(0.8460 [ln(Hardness)] + 2.255)) * (0.998)~~
~~A&Ww chronic standard: (e(0.8460 [ln(Hardness)] + 0.0584)) * (0.997)~~
~~A&Wedw acute standard: (e(0.8460 [ln(Hardness)] + 2.255)) * (0.998)~~
~~A&Wedw chronic standard: (e(0.8460 [ln(Hardness)] + 0.0584)) * (0.997)~~
~~A&We acute standard: (e(0.8460 [ln(Hardness)] + 4.4389)) * (0.998)~~
~~(See Footnote k)~~

~~h. Pentachlorophenol~~
~~A&We acute standard: e(1.005 (pH) - 4.830)~~
~~A&We chronic standard: e(1.005 (pH) - 5.290)~~
~~A&Ww acute standard: e(1.005 (pH) - 4.830)~~
~~A&Ww chronic standard: e(1.005 (pH) - 5.290)~~
~~A&Wedw acute standard: e(1.005 (pH) - 4.830)~~
~~A&Wedw chronic standard: e(1.005 (pH) - 5.290)~~
~~A&We acute standard: e(1.005 (pH) - 3.4306)~~
~~(See Footnote l)~~

~~i. Silver~~
~~A&We acute standard: (e(1.72 [ln(Hardness)] - 6.52)) * (0.85)~~
~~A&Ww acute standard: (e(1.72 [ln(Hardness)] - 6.52)) * (0.85)~~
~~A&Wedw acute standard: (e(1.72 [ln(Hardness)] - 6.52)) * (0.85)~~
~~A&We acute standard: (e(1.72 [ln(Hardness)] - 6.52)) * (0.85)~~
~~(See Footnote k)~~

~~j. Zinc~~
~~A&We acute standard: (e(0.8473 [ln(Hardness)] + 0.884)) * (0.978)~~
~~A&We chronic standard: (e(0.8473 [ln(Hardness)] + 0.884)) * (0.978)~~
~~A&Ww acute standard: (e(0.8473 [ln(Hardness)] + 0.884)) * (0.978)~~
~~A&Ww chronic standard: (e(0.8473 [ln(Hardness)] + 0.884)) * (0.978)~~
~~A&Wedw acute standard: (e(0.8473 [ln(Hardness)] + 0.884)) * (0.978)~~
~~A&Wedw chronic standard: (e(0.8473 [ln(Hardness)] + 0.884)) * (0.978)~~
~~A&We acute standard: (e(0.8473 [ln(Hardness)] + 3.1342)) * (0.978)~~
~~(See Footnote k)~~

~~k. Hardness, expressed as mg/L CaCO3, is inserted into the equation where it says "Hardness." Hardness is determined according to the following criteria:~~
~~1. If the receiving water body has an A&We or A&Ww designated use, then hardness is based on the hardness of the receiving water body from a sample taken at the same time that the sample for the metal is taken, except that the hardness may not exceed 400 mg / L CaCO3.~~
~~2. If the receiving water has an A&Wedw or A&We designated use, then the hardness is based on the hardness of the effluent from a sample taken at the same time that the sample for the metal is taken, except that the hardness may not exceed 400 mg / L CaCO3.~~

~~l. The pH is inserted into the equation where it says "pH". pH is determined according to the following criteria:~~
~~1. If the receiving water has an A&We or A&Ww designated use, then pH is based on the pH of the receiving water body from a sample taken at the same time that the sample for pentachlorophenol is taken.~~
~~2. If the receiving water body has an A&Wedw or A&We designated use, then the pH is based on the pH of the effluent from a sample taken at the same time that the sample for pentachlorophenol is taken.~~

~~m. The mathematical equations for the pH-dependent and hardness-dependent parameters represent the water quality standards. Criteria for the hardness-dependent and pH-dependent parameters have been calculated and are presented in separate tables at the end of Appendix A for the convenience of the user.~~

~~n. In lakes, the acute criteria for sulfide apply only to water samples taken from the epilimnion, or the upper layer of a lake or reservoir.~~

~~o. Bromoform, chloroform, chlorodibromomethane, and dichlorobromomethane are trihalomethanes regulated by the total trihalomethane numeric standard. The total trihalomethane standard is exceeded when the sum of these four compounds exceeds 100 µg / L.~~

~~p. The standard to protect this use is 0.003 µg/L aldrin/dieldrin.~~

~~µg / L - micrograms per liter~~
~~NNS - No numeric standard~~
~~D - Dissolved~~

~~T - Total recoverable~~
~~TTHM - indicates that the chemical is a trihalomethane. See Trihalomethanes, Total for DWS standard.~~

~~Table 3. Acute Water Quality Standards for dissolved Cadmium~~
~~Aquatic and Wildlife ephemeral~~

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
1	NA	41	24.56	81	51.39	121	79.40	161	108.18	201	137.55	241	167.40	281	197.64	321	228.24	361	259.14
2	NA	42	25.21	82	52.08	122	80.11	162	108.90	202	138.29	242	168.15	282	198.40	322	229.01	362	259.91
3	NA	43	25.86	83	52.77	123	80.82	163	109.63	203	139.03	243	168.90	283	199.17	323	229.78	363	260.69
4	NA	44	26.51	84	53.46	124	81.53	164	110.36	204	139.77	244	169.65	284	199.93	324	230.54	364	261.46
5	NA	45	27.17	85	54.15	125	82.24	165	111.09	205	140.51	245	170.40	285	200.69	325	231.31	365	262.24
6	NA	46	27.82	86	54.84	126	82.96	166	111.82	206	141.25	246	171.16	286	201.45	326	232.08	366	263.02
7	NA	47	28.48	87	55.53	127	83.67	167	112.55	207	142.00	247	171.91	287	202.21	327	232.85	367	263.79
8	NA	48	29.14	88	56.22	128	84.38	168	113.28	208	142.74	248	172.66	288	202.97	328	233.62	368	264.57
9	NA	49	29.80	89	56.92	129	85.10	169	114.01	209	143.48	249	173.41	289	203.74	329	234.39	369	265.35
10	NA	50	30.46	90	57.61	130	85.81	170	114.74	210	144.22	250	174.17	290	204.50	330	235.16	370	266.13
11	NA	51	31.12	91	58.31	131	86.53	171	115.47	211	144.97	251	174.92	291	205.26	331	235.93	371	266.90
12	NA	52	31.78	92	59.00	132	87.24	172	116.20	212	145.71	252	175.68	292	206.02	332	236.71	372	267.68
13	NA	53	32.44	93	59.70	133	87.96	173	116.93	213	146.46	253	176.43	293	206.79	333	237.48	373	268.46
14	NA	54	33.11	94	60.39	134	88.68	174	117.66	214	147.20	254	177.18	294	207.55	334	238.25	374	269.24
15	NA	55	33.77	95	61.09	135	89.39	175	118.40	215	147.94	255	177.94	295	208.31	335	239.02	375	270.02
16	NA	56	34.44	96	61.79	136	90.11	176	119.13	216	148.69	256	178.69	296	209.08	336	239.79	376	270.79
17	NA	57	35.11	97	62.48	137	90.83	177	119.86	217	149.43	257	179.45	297	209.84	337	240.56	377	271.57
18	NA	58	35.78	98	63.18	138	91.55	178	120.59	218	150.18	258	180.21	298	210.61	338	241.33	378	272.35
19	NA	59	36.45	99	63.88	139	92.26	179	121.33	219	150.93	259	180.96	299	211.37	339	242.11	379	273.13
20	NA	60	37.12	100	64.58	140	92.98	180	122.06	220	151.67	260	181.72	300	212.13	340	242.88	380	273.91
21	NA	61	37.79	101	65.28	141	93.70	181	122.80	221	152.42	261	182.47	301	212.90	341	243.65	381	274.69
22	NA	62	38.46	102	65.98	142	94.42	182	123.53	222	153.16	262	183.23	302	213.66	342	244.42	382	275.47
23	NA	63	39.13	103	66.68	143	95.14	183	124.27	223	153.91	263	183.99	303	214.43	343	245.20	383	276.25
24	NA	64	39.81	104	67.38	144	95.86	184	125.00	224	154.66	264	184.74	304	215.20	344	245.97	384	277.03
25	14.35	65	40.48	105	68.09	145	96.58	185	125.74	225	155.40	265	185.50	305	215.96	345	246.74	385	277.81
26	14.98	66	41.16	106	68.79	146	97.31	186	126.47	226	156.15	266	186.26	306	216.73	346	247.51	386	278.59
27	15.60	67	41.84	107	69.49	147	98.03	187	127.21	227	156.90	267	187.01	307	217.49	347	248.29	387	279.37
28	16.23	68	42.51	108	70.20	148	98.75	188	127.95	228	157.65	268	187.77	308	218.26	348	249.06	388	280.15
29	16.86	69	43.19	109	70.90	149	99.47	189	128.68	229	158.40	269	188.53	309	219.03	349	249.84	389	280.93
30	17.49	70	43.87	110	71.61	150	100.20	190	129.42	230	159.14	270	189.29	310	219.79	350	250.61	390	281.71
31	18.13	71	44.55	111	72.31	151	100.92	191	130.16	231	159.89	271	190.05	311	220.56	351	251.38	391	282.49
32	18.76	72	45.23	112	73.02	152	101.64	192	130.89	232	160.64	272	190.81	312	221.33	352	252.16	392	283.27
33	19.40	73	45.91	113	73.72	153	102.37	193	131.63	233	161.39	273	191.56	313	222.09	353	252.93	393	284.05
34	20.04	74	46.60	114	74.43	154	103.09	194	132.37	234	162.14	274	192.32	314	222.86	354	253.71	394	284.83
35	20.68	75	47.28	115	75.14	155	103.82	195	133.11	235	162.89	275	193.08	315	223.63	355	254.48	395	285.61
36	21.32	76	47.96	116	75.85	156	104.54	196	133.85	236	163.64	276	193.84	316	224.40	356	255.26	396	286.40
37	21.97	77	48.65	117	76.56	157	105.27	197	134.59	237	164.39	277	194.60	317	225.16	357	256.03	397	287.18
38	22.61	78	49.33	118	77.27	158	106.00	198	135.33	238	165.14	278	195.36	318	225.93	358	256.81	398	287.96
39	23.26	79	50.02	119	77.97	159	106.72	199	136.07	239	165.89	279	196.12	319	226.70	359	257.58	399	288.74
40	23.91	80	50.71	120	78.68	160	107.45	200	136.81	240	166.64	280	196.88	320	227.47	360	258.36	400	289.52

~~Table 4. Acute Water Quality Standards for dissolved Cadmium~~
~~Aquatic and Wildlife coldwater, warmwater, and edw~~

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
1	NA	41	1.62	81	3.39	121	5.24	161	7.14	201	9.08	241	11.05	281	13.05	321	15.07	361	17.11
2	NA	42	1.66	82	3.44	122	5.29	162	7.19	202	9.13	242	11.10	282	13.10	322	15.12	362	17.16
3	NA	43	1.71	83	3.48	123	5.34	163	7.24	203	9.18	243	11.15	283	13.15	323	15.17	363	17.21
4	NA	44	1.75	84	3.53	124	5.38	164	7.29	204	9.23	244	11.20	284	13.20	324	15.22	364	17.27
5	NA	45	1.79	85	3.58	125	5.43	165	7.34	205	9.28	245	11.25	285	13.25	325	15.27	365	17.32
6	NA	46	1.84	86	3.62	126	5.48	166	7.38	206	9.33	246	11.30	286	13.30	326	15.33	366	17.37
7	NA	47	1.88	87	3.67	127	5.52	167	7.43	207	9.38	247	11.35	287	13.35	327	15.38	367	17.42
8	NA	48	1.92	88	3.71	128	5.57	168	7.48	208	9.43	248	11.40	288	13.40	328	15.43	368	17.47
9	NA	49	1.97	89	3.76	129	5.62	169	7.53	209	9.47	249	11.45	289	13.45	329	15.48	369	17.52
10	NA	50	2.01	90	3.80	130	5.67	170	7.58	210	9.52	250	11.50	290	13.50	330	15.53	370	17.57
11	NA	51	2.05	91	3.85	131	5.71	171	7.62	211	9.57	251	11.55	291	13.55	331	15.58	371	17.62
12	NA	52	2.10	92	3.90	132	5.76	172	7.67	212	9.62	252	11.60	292	13.60	332	15.63	372	17.68
13	NA	53	2.14	93	3.94	133	5.81	173	7.72	213	9.67	253	11.65	293	13.65	333	15.68	373	17.73
14	NA	54	2.19	94	3.99	134	5.86	174	7.77	214	9.72	254	11.70	294	13.71	334	15.73	374	17.78
15	NA	55	2.23	95	4.03	135	5.90	175	7.82	215	9.77	255	11.75	295	13.76	335	15.78	375	17.83
16	NA	56	2.27	96	4.08	136	5.95	176	7.87	216	9.82	256	11.80	296	13.81	336	15.83	376	17.88
17	NA	57	2.32	97	4.13	137	6.00	177	7.91	217	9.87	257	11.85	297	13.86	337	15.89	377	17.93
18	NA	58	2.36	98	4.17	138	6.05	178	7.96	218	9.92	258	11.90	298	13.91	338	15.94	378	17.98

19	NA	59	2.41	99	4.22	139	6.09	179	8.01	219	9.97	259	11.95	299	13.96	339	15.99	379	18.04
20	NA	60	2.45	100	4.26	140	6.14	180	8.06	220	10.02	260	12.00	300	14.01	340	16.04	380	18.09
21	NA	61	2.50	101	4.31	141	6.19	181	8.11	221	10.06	261	12.05	301	14.06	341	16.09	381	18.14
22	NA	62	2.54	102	4.36	142	6.24	182	8.16	222	10.11	262	12.10	302	14.11	342	16.14	382	18.19
23	NA	63	2.58	103	4.40	143	6.28	183	8.21	223	10.16	263	12.15	303	14.16	343	16.19	383	18.24
24	NA	64	2.63	104	4.45	144	6.33	184	8.25	224	10.21	264	12.20	304	14.21	344	16.24	384	18.29
25	0.95	65	2.67	105	4.50	145	6.38	185	8.30	225	10.26	265	12.25	305	14.26	345	16.29	385	18.34
26	0.99	66	2.72	106	4.54	146	6.43	186	8.35	226	10.31	266	12.30	306	14.31	346	16.34	386	18.40
27	1.03	67	2.76	107	4.59	147	6.47	187	8.40	227	10.36	267	12.35	307	14.36	347	16.40	387	18.45
28	1.07	68	2.81	108	4.64	148	6.52	188	8.45	228	10.41	268	12.40	308	14.41	348	16.45	388	18.50
29	1.11	69	2.85	109	4.68	149	6.57	189	8.50	229	10.46	269	12.45	309	14.46	349	16.50	389	18.55
30	1.16	70	2.90	110	4.73	150	6.62	190	8.55	230	10.51	270	12.50	310	14.51	350	16.55	390	18.60
31	1.20	71	2.94	111	4.77	151	6.66	191	8.59	231	10.56	271	12.55	311	14.56	351	16.60	391	18.65
32	1.24	72	2.99	112	4.82	152	6.71	192	8.64	232	10.61	272	12.60	312	14.61	352	16.65	392	18.71
33	1.28	73	3.03	113	4.87	153	6.76	193	8.69	233	10.66	273	12.65	313	14.67	353	16.70	393	18.76
34	1.32	74	3.08	114	4.91	154	6.81	194	8.74	234	10.71	274	12.70	314	14.72	354	16.75	394	18.81
35	1.37	75	3.12	115	4.96	155	6.86	195	8.79	235	10.76	275	12.75	315	14.77	355	16.80	395	18.86
36	1.41	76	3.17	116	5.01	156	6.90	196	8.84	236	10.81	276	12.80	316	14.82	356	16.86	396	18.91
37	1.45	77	3.21	117	5.06	157	6.95	197	8.89	237	10.86	277	12.85	317	14.87	357	16.91	397	18.96
38	1.49	78	3.26	118	5.10	158	7.00	198	8.94	238	10.90	278	12.90	318	14.92	358	16.96	398	19.01
39	1.54	79	3.30	119	5.15	159	7.05	199	8.98	239	10.95	279	12.95	319	14.97	359	17.01	399	19.07
40	1.58	80	3.35	120	5.20	160	7.10	200	9.03	240	11.00	280	13.00	320	15.02	360	17.06	400	19.12

Table 5. Chronic Water Quality Standards for dissolved Cadmium
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
1	NA	41	1.16	81	1.92	121	2.58	161	3.18	201	3.75	241	4.28	281	4.80	321	5.29	361	5.77
2	NA	42	1.18	82	1.93	122	2.59	162	3.20	202	3.76	242	4.30	282	4.81	322	5.30	362	5.78
3	NA	43	1.20	83	1.95	123	2.61	163	3.21	203	3.77	243	4.31	283	4.82	323	5.32	363	5.79
4	NA	44	1.22	84	1.97	124	2.62	164	3.23	204	3.79	244	4.32	284	4.84	324	5.33	364	5.81
5	NA	45	1.24	85	1.98	125	2.64	165	3.24	205	3.80	245	4.34	285	4.85	325	5.34	365	5.82
6	NA	46	1.26	86	2.00	126	2.65	166	3.25	206	3.82	246	4.35	286	4.86	326	5.35	366	5.83
7	NA	47	1.28	87	2.02	127	2.67	167	3.27	207	3.83	247	4.36	287	4.87	327	5.36	367	5.84
8	NA	48	1.30	88	2.04	128	2.69	168	3.28	208	3.84	248	4.38	288	4.89	328	5.38	368	5.85
9	NA	49	1.32	89	2.05	129	2.70	169	3.30	209	3.86	249	4.39	289	4.90	329	5.39	369	5.86
10	NA	50	1.34	90	2.07	130	2.72	170	3.31	210	3.87	250	4.40	290	4.91	330	5.40	370	5.88
11	NA	51	1.36	91	2.09	131	2.73	171	3.33	211	3.88	251	4.41	291	4.92	331	5.41	371	5.89
12	NA	52	1.38	92	2.10	132	2.75	172	3.34	212	3.90	252	4.43	292	4.94	332	5.42	372	5.90
13	NA	53	1.40	93	2.12	133	2.76	173	3.35	213	3.91	253	4.44	293	4.95	333	5.44	373	5.91
14	NA	54	1.42	94	2.14	134	2.78	174	3.37	214	3.92	254	4.45	294	4.96	334	5.45	374	5.92
15	NA	55	1.44	95	2.15	135	2.79	175	3.38	215	3.94	255	4.47	295	4.97	335	5.46	375	5.93
16	NA	56	1.46	96	2.17	136	2.81	176	3.40	216	3.95	256	4.48	296	4.98	336	5.47	376	5.95
17	NA	57	1.48	97	2.19	137	2.82	177	3.41	217	3.97	257	4.49	297	5.00	337	5.48	377	5.96
18	NA	58	1.50	98	2.20	138	2.84	178	3.43	218	3.98	258	4.50	298	5.01	338	5.50	378	5.97
19	NA	59	1.51	99	2.22	139	2.85	179	3.44	219	3.99	259	4.52	299	5.02	339	5.51	379	5.98
20	NA	60	1.53	100	2.24	140	2.87	180	3.45	220	4.01	260	4.53	300	5.03	340	5.52	380	5.99
21	NA	61	1.55	101	2.25	141	2.88	181	3.47	221	4.02	261	4.54	301	5.05	341	5.53	381	6.00
22	NA	62	1.57	102	2.27	142	2.90	182	3.48	222	4.03	262	4.56	302	5.06	342	5.54	382	6.02
23	NA	63	1.59	103	2.29	143	2.91	183	3.50	223	4.05	263	4.57	303	5.07	343	5.56	383	6.03
24	NA	64	1.61	104	2.30	144	2.93	184	3.51	224	4.06	264	4.58	304	5.08	344	5.57	384	6.04
25	0.80	65	1.63	105	2.32	145	2.94	185	3.53	225	4.07	265	4.59	305	5.10	345	5.58	385	6.05
26	0.83	66	1.65	106	2.34	146	2.96	186	3.54	226	4.09	266	4.61	306	5.11	346	5.59	386	6.06
27	0.85	67	1.66	107	2.35	147	2.97	187	3.55	227	4.10	267	4.62	307	5.12	347	5.60	387	6.07
28	0.87	68	1.68	108	2.37	148	2.99	188	3.57	228	4.11	268	4.63	308	5.13	348	5.62	388	6.08
29	0.89	69	1.70	109	2.39	149	3.00	189	3.58	229	4.13	269	4.65	309	5.15	349	5.63	389	6.10
30	0.92	70	1.72	110	2.40	150	3.02	190	3.60	230	4.14	270	4.66	310	5.16	350	5.64	390	6.11
31	0.94	71	1.74	111	2.42	151	3.03	191	3.61	231	4.15	271	4.67	311	5.17	351	5.65	391	6.12
32	0.96	72	1.76	112	2.43	152	3.05	192	3.62	232	4.17	272	4.68	312	5.18	352	5.66	392	6.13
33	0.98	73	1.77	113	2.45	153	3.06	193	3.64	233	4.18	273	4.70	313	5.19	353	5.68	393	6.14
34	1.01	74	1.79	114	2.47	154	3.08	194	3.65	234	4.19	274	4.71	314	5.21	354	5.69	394	6.15
35	1.03	75	1.81	115	2.48	155	3.09	195	3.66	235	4.21	275	4.72	315	5.22	355	5.70	395	6.17
36	1.05	76	1.83	116	2.50	156	3.11	196	3.68	236	4.22	276	4.73	316	5.23	356	5.71	396	6.18
37	1.07	77	1.84	117	2.51	157	3.12	197	3.69	237	4.23	277	4.75	317	5.24	357	5.72	397	6.19
38	1.09	78	1.86	118	2.53	158	3.14	198	3.71	238	4.24	278	4.76	318	5.26	358	5.73	398	6.20
39	1.11	79	1.88	119	2.54	159	3.15	199	3.72	239	4.26	279	4.77	319	5.27	359	5.75	399	6.21
40	1.14	80	1.90	120	2.56	160	3.17	200	3.73	240	4.27	280	4.78	320	5.28	360	5.76	400	6.22

Table 1. Water Quality Criteria By Designated Use

PARAMETER	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic ↓ (µg/L)	A&Wedw Acute (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
Acenaphthene	83329	420	198	56,000	56,000	850	550	850	550	850	550			
Acrolein	107028	3.5	1.9	467	467	34	30	34	30	34	30			
Acrylonitrile	107131	0.06	0.2	3	37,333	3,800	250	3,800	250	3,800	250			
Alachlor	15972608	2		9,333	9,333	2,500	170	2,500	170	2,500	170			
Aldrin	309002	0.002	0.00005	0.08	28	3		3		3		4.5	0.003	See (b)
Alpha Particles (Gross) Radioactivity		15 pCi/L												
Ammonia	7664417					See (e) & Table 25	See (e) & Table 26	See (e) & Table 25	See (e) & Table 26	See (e) & Table 25	See (e) & Table 26			
Anthracene	120127	2,100	74	280,000	280,000									
Antimony	7440360	6 T	640 T	747 T	747 T	88 D	30 D	88 D	30 D	1,000 D	600 D			
Arsenic	7440382	10 T	80 T	30 T	280 T	340 D	150 D	340 D	150 D	340 D	150 D	440 D	2,000 T	200 T
Asbestos	1332214	(a)												
Atrazine	1912249	3		32,667	32,667									
Barium	7440393	2,000 T		163,333 T	163,333 T									
Benz(a)anthracene	56553	0.005	0.02	0.2	0.2									
Benzene	71432	5	114	40	3,733	2,700	180	2,700	180	8,800	560			
3, 4 Benzfluoranthene	205992	0.005	0.02	0.2	0.2									
Benzidine	92875	0.0002	0.0002	0.01	2,800	1,300	89	1,300	89	1,300	89	10,000	0.01	0.01
Benzo(a)pyrene	50328	0.2	0.02	0.2	0.2									
Benzo(k)fluoranthene	207089	0.005	0.02	0.2	0.2									
Beryllium	7440417	4 T	84	1,867 T	1,867 T									
Beta particles and photon emitters		4 mil-lirems /year												
Bis(2-chloroethyl) ether	111444	0.03	0.5	1	1	120,000	6,700	120,000	6,700	120,000	6,700			
Bis(2-chloroisopropyl) ether	108601	280	3,441	37,333	37,333									
Boron	7440428	1,400 T		186,667	186,667								1,000 T	
Bromodichloromethane	75274	TTHM See (g)	17	18,667	18,667									
p-Bromodiphenyl ether	101553					180	14	180	14	180	14			
Bromoform	75252	TTHM See (g)	133	18,667	18,667	15,000	10,000	15,000	10,000	15,000	10,000			
Bromomethane	74839	9.8	299	1,307	1,307	5,500	360	5,500	360	5,500	360			
Butyl benzyl phthalate	85687	1,400	386	186,667	186,667	1,700	130	1,700	130	1,700	130			
Cadmium	7440439	5 T	6	467 T	467 T	See (d) & Table 2	See (d) & Table 3	See (d) & Table 4	See (d) & Table 5	See (d) & Table 4	See (d) & Table 5	See (d) & Table 6	50	50
Carbofuran	1563662	40		4,667	4,667	650	50	650	50	650	50			
Carbon tetrachloride	56235	5	2	11	1,307	18,000	1,100	18,000	1,100	18,000	1,100			
Chlordane	57749	2	0.0008	4	467	2.4	0.004	2.4	0.2	2.4	0.2	3.2		
Chlorine (total residual)	7782505	4,000		4,000	4,000	19	11	19	11	19	11			
Chlorobenzene	108907	100	1,553	18,667	18,667	3,800	260	3,800	260	3,800	260			
2-Chloroethyl vinyl ether	110758					180,000	9,800	180,000	9,800	180,000	9,800			
Chloroform	67663	TTHM See (g)	2,133	9,333	9,333	14,000	900	14,000	900	14,000	900			
p-Chloro-m-cresol	59507					15	4.7	15	4.7	15	4.7	48,000		
Chloromethane	74873					270,000	15,000	270,000	15,000	270,000	15,000			
2-Chloronapthalene	91587	560	317	74,667	74,667									
2-Chlorophenol	95578	35	30	4,667	4,667	2,200	150	2,200	150	2,200	150			
Chloropyrifos	2921882	21		2,800	2,800	0.08	0.04	0.08	0.04	0.08	0.04			
Chromium III	16065831		75,000	1,400,000	1,400,000	See (d) & Table 7	See (d) & Table 8	See (d) & Table 7	See (d) & Table 8	See (d) & Table 7	See (d) & Table 8	See (d) & Table 9		
Chromium VI	18540299	21 T	150 T	2,800 T	2,800 T	16 D	11 D	16 D	11 D	16 D	11 D	34 D		
Chromium (Total)	7440473	100 T											1,000	1,000
Chrysene	218019	0.005	0.02	0.2	0.2									
Copper	7440508	1,300 T		1,300 T	1,300 T	See (d) & Table 10	See (d) & Table 11	See (d) & Table 10	See (d) & Table 11	See (d) & Table 10	See (d) & Table 11	See (d) & Table 12	5,000 T	500 T
Cyanide (as free cyanide)	57125	200 T	16,000 T	18,667 T	18,667 T	22 T	5.2 T	41 T	9.7 T	41 T	9.7 T	84 T		200 T
Dalapon	75990	200	8,000	28,000	28,000									
Dibenz (ah) anthracene	53703	0.005	0.02	0.2	0.2									
Dibromochloromethane	124481	TTHM See (g)	13	18,667	18,667									
1,2-Dibromo-3-chloropro-pane	96128	0.2												
1,2-Dibromoethane	106934	0.05		8,400	8,400									
Dibutyl phthalate	84742	700	899	93,333	93,333	470	35	470	35	470	35	1,100		
1,2-Dichlorobenzene	95501	600	205	84,000	84,000	790	300	1,200	470	1,200	470	5,900		
1,3-Dichlorobenzene	541731					2,500	970	2,500	970	2,500	970			
1,4-Dichlorobenzene	106467	75	5,755	373,333	373,333	560	210	2,000	780	2,000	780	6,500		

Table 1. Water Quality Criteria By Designated Use

PARAMETER	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
3,3'-Dichlorobenzidine	91941	0.08	0.03	3	3									
p,p'-Dichlorodiphenyl-trichloroethane (DDT) and metabolites (DDD) and (DDE)	50293	0.1	0.0002	4	467	1.1	0.001	1.1	0.001	1.1	0.001	1.1	0.001	0.001
1,2-Dichloroethane	107062	5	37	15	186,667	59,000	41,000	59,000	41,000	59,000	41,000			
1,1-Dichloroethylene	75354	7	7,143	46,667	46,667	15,000	950	15,000	950	15,000	950			
1,2-cis-Dichloroethylene	156592	70		70	70									
1,2-trans-Dichloroethyl-ene	156605	100	10,127	18,667	18,667	68,000	3,900	68,000	3,900	68,000	3,900			
Dichloromethane	75092	5	593	187	56,000	97,000	5,500	97,000	5,500	97,000	5,500			
2,4-Dichlorophenol	120832	21	59	2,800	2,800	1,000	88	1,000	88	1,000	88			
2,4-Dichlorophenoxyace-tic acid (2,4-D)	94757	70		9,333	9,333									
1,2-Dichloropropane	78875	5	17,518	84,000	84,000	26,000	9,200	26,000	9,200	26,000	9,200			
1,3-Dichloropropene	542756	0.7	42	28	28,000	3,000	1,100	3,000	1,100	3,000	1,100			
Dieldrin	60571	0.002	0.00005	0.09	47	0.2	0.06	0.2	0.06	0.2	0.06	4	0.003	See (b)
Diethyl phthalate	84662	5,600	8,767	746,667	746,667	26,000	1,600	26,000	1,600	26,000	1,600			
Di (2-ethylhexyl) adipate	103231	400		560,000	560,000									
Di (2-ethylhexyl) phtha-late	117817	6	3	100	18,667	400	360	400	360	400	360	3,100		
2,4-Dimethylphenol	105679	140	171	18,667	18,667	1,000	310	1,000	310	1,000	310	150,000		
Dimethyl phthalate	131113					17,000	1,000	17,000	1,000	17,000	1,000			
4,6-Dinitro-o-cresol	534521	28	582	3,733	3,733	310	24	310	24	310	24			
2,4-Dinitrophenol	51285	14	1,067	1,867	1,867	110	9.2	110	9.2	110	9.2			
2,4-Dinitrotoluene	121142	14	421	1,867	1,867	14,000	860	14,000	860	14,000	860			
2,6-Dinitrotoluene	606202	0.05		2	3,733									
Di-n-octyl phthalate	117840	2,800		373,333	373,333									
Dinoseb	88857	7		933	933									
1,2-Diphenylhydrazine	122667	0.04	0.2	2	2	130	11	130	11	130	11			
Diquat	85007	20		2,053	2,053									
Endosulfan sulfate	1031078	42	18	5,600	5,600	0.2	0.06	0.2	0.06	0.2	0.06	3		
Endosulfan (Total)	115297	42	18	5,600	5,600	0.2	0.06	0.2	0.06	0.2	0.06	3		
Endothall	145733	100		18,667	18,667									
Endrin	72208	2	0.06	280	280	0.09	0.04	0.09	0.04	0.09	0.04	0.7	0.004	0.004
Endrin aldehyde	7421933					0.09	0.04	0.09	0.04	0.09	0.04	0.7		
Ethylbenzene	100414	700	2,133	93,333	93,333	23,000	1,400	23,000	1,400	23,000	1,400			
Fluoranthene	206440	280	28	37,333	37,333	2,000	1,600	2,000	1,600	2,000	1,600			
Fluorene	86737	280	1,067	37,333	37,333									
Fluoride	7782414	4,000		140,000	140,000									
Glyphosate	1071836	700	266,667	93,333	93,333									
Guthion	86500						0.01		0.01		0.01			
Heptachlor	76448	0.4	0.00008	0.4	467	0.5	0.004	0.5	0.004	0.6	0.01	0.9		
Heptachlor epoxide	1024573	0.2	0.00004	0.2	12	0.5	0.004	0.5	0.004	0.6	0.01	0.9		
Hexachlorobenzene	118741	1	0.0003	1	747	6	3.7	6	3.7	6	3.7			
Hexachlorobutadiene	87683	0.4	18	18	187	45	8.2	45	8.2	45	8.2			
Hexachlorocyclohexane alpha	319846	0.006	0.005	0.2	7,467	1,600	130	1,600	130	1,600	130	1,600		
Hexachlorocyclohexane beta	319857	0.02	0.02	0.8	560	1,600	130	1,600	130	1,600	130	1,600		
Hexachlorocyclohexane delta	319868					1,600	130	1,600	130	1,600	130	1,600		
Hexachlorocyclohexane gamma (lindane)	58899	0.2	1.8	280	280	1		1		1		11		
Hexachlorocyclopentadi-ene	77474	50	74	11,200	11,200	3.5	0.3	3.5	0.3	3.5	0.3			
Hexachloroethane	67721	2.5	3.3	100	933	490	350	490	350	490	350	850		
Hydrogen sulfide	7783064						2 See (c)		2 See (c)		2 See (c)			
Indeno (1,2,3-cd) pyrene	193395	0.05	0.2	1.9	1.9									
Iron	7439896						1,000		1,000		1,000			
Isophorone	78591	37	961	1,474	186,667	59,000	43,000	59,000	43,000	59,000	43,000			
Lead	7439971	15 T		15 T	15 T	See (d) & Table 13	See (d) & Table 14	See (d) & Table 13	See (d) & Table 14	See (d) & Table 13	See (d) & Table 14	See (d) & Table 15	10,000 T	100 T
Malathion	121755	140		18,667	18,667		0.1		0.1		0.1			
Manganese	7439965	980		130,667	130,667								10,000	
Mercury	7439976	2 T		280 T	280 T	2.4 D	0.01 D	2.4 D	0.01 D	2.4 D	0.01 D	5 D		10 T
Methoxychlor	72435	40		4,667	4,667		0.03		0.03		0.03			
Methylmercury			0.3 mg/kg											
Mirex	2385855	1		187	187		0.001		0.001		0.001			
Naphthalene	91203	140	1,524	18,667	18,667	1,100	210	3,200	580	3,200	580			

Table 1. Water Quality Criteria By Designated Use

PARAMETER	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
Nickel	7440020	210 T	511 T	28,000 T	28,000 T	See (d) & Table 16	See (d) & Table 17	See (d) & Table 16	See (d) & Table 17	See (d) & Table 16	See (d) & Table 17	See (d) & Table 18		
Nitrate	14797558	10,000		3,733,333	3,733,333									
Nitrite	14797650	1,000		233,333	233,333									
Nitrate + Nitrite		10,000												
Nitrobenzene	98953	3.5	138	467	467	1,300	850	1,300	850	1,300	850			
p-Nitrophenol	100027					4,100	3,000	4,100	3,000	4,100	3,000			
N-nitrosodimethylamine	62759	0.001	3	0.03	0.03									
N-nitrosodi-n-pheny-lamine	86306	7.1	6	286	286	2,900	200	2,900	2,00	2,900	200			
N-nitrosodi-n-propy-lamine	621647													
Oxamyl	23135220													
Parathion	56382													
Paraquat	1910425													
Pentachlorophenol	87865													
Permethrin	52645531													
Phenanthrene	85018													
Phenol	108952													
Picloram	1918021													
Polychlorinatedbiphenyls (PCBs)	1336363													
Pyrene	129000													
Radium 226 + Radium 228														
Selenium	7782492													
Silver	7440224													
Simazine	112349													
Styrene	100425													
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	1746016	0.00003	0.000000005	0.00003	0.0009	0.01	0.005	0.01	0.005	0.01	0.005	0.1		
1,1,2,2-Tetrachloroethane	79345	0.2	4	7	93,333	4,700	3,200	4,700	3,200	4,700	3,200			
Tetrachloroethylene	127184	5	261	9,333	9,333	2,600	280	6,500	680	6,500	680	15,000		
Thallium	7440280	2 T	1 T	75 T	75 T	700 D	150 D	700 D	150 D	700 D	150 D			
Toluene	108883	1,000	29,907	373,333	373,333	8,700	180	8,700	180	8,700	180			
Toxaphene	8001352	3	0.0003	3	933	0.7	0.0002	0.7	0.0002	0.7	0.0002	11	0.005	0.005
Tributylin						0.5	0.07	0.5	0.07	0.5	0.07			
1,2,4-Trichlorobenzene	120821	70	70	9,333	9,333	750	130	1,700	300	1,700	300			
1,1,1-Trichloroethane	71556	200	428,571	1,866,667	1,866,667	2,600	1,600	2,600	1,600	2,600	1,600		1,000	
1,1,2-Trichloroethane	79005	5	16	25	3,733	18,000	12,000	18,000	12,000	18,000	12,000			
Trichloroethylene	79016	5	29	108	280	20,000	1,300	20,000	1,300	20,000	1,300			
2,4,6-Trichlorophenol	88062	3.2	2	127	127	160	25	160	25	160	25	3,000		
2,4,5-Trichlorophenoxy proprionic acid (2,4,5-TP)	93721	50		7,467	7,467									
Trihalomethanes (T)		80												
Uranium	7440611	30 D		2,800	2,800									
Vinyl chloride	75014	2	5	2	2,800									
Xylenes (T)	1330207	10,000		186,667	186,667									
Zinc	7440666	2,100 T	5,106 T	280,000 T	280,000 T	See (d) & Table 20	See (d) & Table 20	See (d) & Table 20	See (d) & Table 20	See (d) & Table 20	See (d) & Table 20	See (d) & Table 21	10,000 T	25,000 T

Footnotes

a. The asbestos standard is 7 million fibers (longer than 10 micrometers) per liter.

b. The aldrin/dieldrin standard is exceeded when the sum of the two compounds exceeds 0.003 µg/L.

c. In lakes, the acute criteria for hydrogen sulfide apply only to water samples taken from the epilimnion, or the upper layer of a lake or reservoir.

d. Hardness, expressed as mg/L $CaCO_3$, is determined according to the following criteria:

i. If the receiving water body has an A&Wc or A&Ww designated use, then hardness is based on the hardness of the receiving water body from a sample taken at the same time that the sample for the metal is taken, except that the hardness may not exceed 400 mg/L $CaCO_3$.

ii. If the receiving water has an A&Wedw or A&We designated use, then the hardness is based on the hardness of the effluent from a sample taken at the same time that the sample for the metal is taken, except that the hardness

may not exceed 400 mg/L CaCO3.

e. pH is determined according to the following criteria:
   i. If the receiving water has an A&Wc or A&Ww designated use, then pH is based on the pH of the receiving water body from a sample taken at the same time that the sample for pentachlorophenol or ammonia is taken.
   ii. If the receiving water body has an A&Wedw or A&We designated use, then the pH is based on the pH of the effluent from a sample taken at the same time that the sample for pentachlorophenol or ammonia is taken.

f. Table 1 abbreviations.
   i. µg/L = micrograms per liter,
   ii. mg/kg = milligrams per kilogram,
   iii. pCi/L = picocuries per liter,
   iv. D = dissolved,
   v. T = total recoverable,
   vi. TTHM indicates that the chemical is a trihalomethane.

g. The total trihalomethane (TTHM) standard is exceeded when the sum of these four compounds exceeds 80 µg/L, as a rolling annual average.

Table 2. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
1	0.02	41	0.85	81	1.64	121	2.42	161	3.20	201	3.97	241	4.73	281	5.49	321	6.25	361	7.00
2	0.04	42	0.87	82	1.66	122	2.44	162	3.22	202	3.99	242	4.75	282	5.51	322	6.27	362	7.02
3	0.07	43	0.89	83	1.68	123	2.46	163	3.24	203	4.01	243	4.77	283	5.53	323	6.29	363	7.04
4	0.09	44	0.91	84	1.70	124	2.48	164	3.26	204	4.03	244	4.79	284	5.55	324	6.31	364	7.06
5	0.11	45	0.93	85	1.72	125	2.50	165	3.28	205	4.04	245	4.81	285	5.57	325	6.33	365	7.08
6	0.13	46	0.95	86	1.74	126	2.52	166	3.30	206	4.06	246	4.83	286	5.59	326	6.34	366	7.10
7	0.15	47	0.97	87	1.76	127	2.54	167	3.31	207	4.08	247	4.85	287	5.61	327	6.36	367	7.12
8	0.17	48	0.99	88	1.78	128	2.56	168	3.33	208	4.10	248	4.87	288	5.63	328	6.38	368	7.14
9	0.19	49	1.01	89	1.80	129	2.58	169	3.35	209	4.12	249	4.88	289	5.64	329	6.40	369	7.15
10	0.21	50	1.03	90	1.82	130	2.60	170	3.37	210	4.14	250	4.90	290	5.66	330	6.42	370	7.17
11	0.23	51	1.05	91	1.84	131	2.62	171	3.39	211	4.16	251	4.92	291	5.68	331	6.44	371	7.19
12	0.26	52	1.07	92	1.86	132	2.64	172	3.41	212	4.18	252	4.94	292	5.70	332	6.46	372	7.21
13	0.28	53	1.09	93	1.88	133	2.66	173	3.43	213	4.20	253	4.96	293	5.72	333	6.48	373	7.23
14	0.30	54	1.11	94	1.90	134	2.68	174	3.45	214	4.22	254	4.98	294	5.74	334	6.50	374	7.25
15	0.32	55	1.13	95	1.92	135	2.70	175	3.47	215	4.24	255	5.00	295	5.76	335	6.51	375	7.27
16	0.34	56	1.15	96	1.94	136	2.72	176	3.49	216	4.26	256	5.02	296	5.78	336	6.53	376	7.29
17	0.36	57	1.17	97	1.95	137	2.73	177	3.51	217	4.27	257	5.04	297	5.80	337	6.55	377	7.30
18	0.38	58	1.19	98	1.97	138	2.75	178	3.53	218	4.29	258	5.06	298	5.81	338	6.57	378	7.32
19	0.40	59	1.21	99	1.99	139	2.77	179	3.55	219	4.31	259	5.08	299	5.83	339	6.59	379	7.34
20	0.42	60	1.23	100	2.01	140	2.79	180	3.56	220	4.33	260	5.09	300	5.85	340	6.61	380	7.36
21	0.44	61	1.25	101	2.03	141	2.81	181	3.58	221	4.35	261	5.11	301	5.87	341	6.63	381	7.38
22	0.46	62	1.26	102	2.05	142	2.83	182	3.60	222	4.37	262	5.13	302	5.89	342	6.65	382	7.40
23	0.48	63	1.28	103	2.07	143	2.85	183	3.62	223	4.39	263	5.15	303	5.91	343	6.66	383	7.42
24	0.50	64	1.30	104	2.09	144	2.87	184	3.64	224	4.41	264	5.17	304	5.93	344	6.68	384	7.44
25	0.52	65	1.32	105	2.11	145	2.89	185	3.66	225	4.43	265	5.19	305	5.95	345	6.70	385	7.45
26	0.54	66	1.34	106	2.13	146	2.91	186	3.68	226	4.45	266	5.21	306	5.97	346	6.72	386	7.47
27	0.56	67	1.36	107	2.15	147	2.93	187	3.70	227	4.47	267	5.23	307	5.99	347	6.74	387	7.49
28	0.58	68	1.38	108	2.17	148	2.95	188	3.72	228	4.48	268	5.25	308	6.00	348	6.76	388	7.51
29	0.60	69	1.40	109	2.19	149	2.97	189	3.74	229	4.50	269	5.27	309	6.02	349	6.78	389	7.53

Table 2. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
30	0.62	70	1.42	110	2.21	150	2.99	190	3.76	230	4.52	270	5.28	310	6.04	350	6.80	390	7.55
31	0.64	71	1.44	111	2.23	151	3.01	191	3.78	231	4.54	271	5.30	311	6.06	351	6.82	391	7.57
32	0.66	72	1.46	112	2.25	152	3.03	192	3.80	232	4.56	272	5.32	312	6.08	352	6.83	392	7.59
33	0.68	73	1.48	113	2.27	153	3.04	193	3.81	233	4.58	273	5.34	313	6.10	353	6.85	393	7.60
34	0.70	74	1.50	114	2.29	154	3.06	194	3.83	234	4.60	274	5.36	314	6.12	354	6.87	394	7.62
35	0.72	75	1.52	115	2.31	155	3.08	195	3.85	235	4.62	275	5.38	315	6.14	355	6.89	395	7.64
36	0.75	76	1.54	116	2.33	156	3.10	196	3.87	236	4.64	276	5.40	316	6.16	356	6.91	396	7.66
37	0.77	77	1.56	117	2.35	157	3.12	197	3.89	237	4.66	277	5.42	317	6.17	357	6.93	397	7.68
38	0.79	78	1.58	118	2.37	158	3.14	198	3.91	238	4.68	278	5.44	318	6.19	358	6.95	398	7.70
39	0.81	79	1.60	119	2.38	159	3.16	199	3.93	239	4.69	279	5.45	319	6.21	359	6.97	399	7.72
40	0.83	80	1.62	120	2.40	160	3.18	200	3.95	240	4.71	280	5.47	320	6.23	360	6.98	400	7.74

Table 3. Chronic Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
1	0.01	41	0.13	81	0.21	121	0.28	161	0.34	201	0.40	241	0.45	281	0.50	321	0.55	361	0.60
2	0.02	42	0.13	82	0.21	122	0.28	162	0.34	202	0.40	242	0.45	282	0.50	322	0.55	362	0.60
2	0.02	42	0.13	82	0.21	122	0.28	162	0.34	202	0.40	242	0.45	282	0.50	322	0.55	362	0.60
3	0.02	43	0.14	83	0.22	123	0.28	163	0.35	203	0.40	243	0.46	283	0.51	323	0.55	363	0.60
4	0.03	44	0.14	84	0.22	124	0.29	164	0.35	204	0.40	244	0.46	284	0.51	324	0.56	364	0.60
5	0.03	45	0.14	85	0.22	125	0.29	165	0.35	205	0.40	245	0.46	285	0.51	325	0.56	365	0.60
6	0.03	46	0.14	86	0.22	126	0.29	166	0.35	206	0.41	246	0.46	286	0.51	326	0.56	366	0.60
7	0.04	47	0.15	87	0.22	127	0.29	167	0.35	207	0.41	247	0.46	287	0.51	327	0.56	367	0.61
8	0.04	48	0.15	88	0.23	128	0.29	168	0.35	208	0.41	248	0.46	288	0.51	328	0.56	368	0.61
9	0.05	49	0.15	89	0.23	129	0.29	169	0.35	209	0.41	249	0.46	289	0.51	329	0.56	369	0.61
10	0.05	50	0.15	90	0.23	130	0.30	170	0.36	210	0.41	250	0.46	290	0.51	330	0.56	370	0.61
11	0.05	51	0.15	91	0.23	131	0.30	171	0.36	211	0.41	251	0.47	291	0.52	331	0.56	371	0.61
12	0.06	52	0.16	92	0.23	132	0.30	172	0.36	212	0.41	252	0.47	292	0.52	332	0.57	372	0.61
13	0.06	53	0.16	93	0.23	133	0.30	173	0.36	213	0.42	253	0.47	293	0.52	333	0.57	373	0.61
14	0.06	54	0.16	94	0.24	134	0.30	174	0.36	214	0.42	254	0.47	294	0.52	334	0.57	374	0.61
15	0.07	55	0.16	95	0.24	135	0.30	175	0.36	215	0.42	255	0.47	295	0.52	335	0.57	375	0.62
16	0.07	56	0.16	96	0.24	136	0.30	176	0.36	216	0.42	256	0.47	296	0.52	336	0.57	376	0.62
17	0.07	57	0.17	97	0.24	137	0.31	177	0.37	217	0.42	257	0.47	297	0.52	337	0.57	377	0.62
18	0.07	58	0.17	98	0.24	138	0.31	178	0.37	218	0.42	258	0.47	298	0.52	338	0.57	378	0.62
19	0.08	59	0.17	99	0.24	139	0.31	179	0.37	219	0.42	259	0.48	299	0.53	339	0.57	379	0.62
20	0.08	60	0.17	100	0.25	140	0.31	180	0.37	220	0.43	260	0.48	300	0.53	340	0.57	380	0.62
21	0.08	61	0.17	101	0.25	141	0.31	181	0.37	221	0.43	261	0.48	301	0.53	341	0.58	381	0.62
22	0.09	62	0.18	102	0.25	142	0.31	182	0.37	222	0.43	262	0.48	302	0.53	342	0.58	382	0.62
23	0.09	63	0.18	103	0.25	143	0.32	183	0.37	223	0.43	263	0.48	303	0.53	343	0.58	383	0.62
24	0.09	64	0.18	104	0.25	144	0.32	184	0.38	224	0.43	264	0.48	304	0.53	344	0.58	384	0.63
25	0.09	65	0.18	105	0.25	145	0.32	185	0.38	225	0.43	265	0.48	305	0.53	345	0.58	385	0.63
26	0.10	66	0.18	106	0.26	146	0.32	186	0.38	226	0.43	266	0.48	306	0.53	346	0.58	386	0.63

Table 3. Chronic Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife coldwater

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
27	0.10	67	0.19	107	0.26	147	0.32	187	0.38	227	0.43	267	0.49	307	0.54	347	0.58	387	0.63
28	0.10	68	0.19	108	0.26	148	0.32	188	0.38	228	0.44	268	0.49	308	0.54	348	0.58	388	0.63
29	0.10	69	0.19	109	0.26	149	0.32	189	0.38	229	0.44	269	0.49	309	0.54	349	0.59	389	0.63
30	0.11	70	0.19	110	0.26	150	0.33	190	0.38	230	0.44	270	0.49	310	0.54	350	0.59	390	0.63
31	0.11	71	0.19	111	0.26	151	0.33	191	0.39	231	0.44	271	0.49	311	0.54	351	0.59	391	0.63
32	0.11	72	0.20	112	0.27	152	0.33	192	0.39	232	0.44	272	0.49	312	0.54	352	0.59	392	0.63
33	0.11	73	0.20	113	0.27	153	0.33	193	0.39	233	0.44	273	0.49	313	0.54	353	0.59	393	0.64
34	0.12	74	0.20	114	0.27	154	0.33	194	0.39	234	0.44	274	0.50	314	0.54	354	0.59	394	0.64
35	0.12	75	0.20	115	0.27	155	0.33	195	0.39	235	0.45	275	0.50	315	0.55	355	0.59	395	0.64
36	0.12	76	0.20	116	0.27	156	0.33	196	0.39	236	0.45	276	0.50	316	0.55	356	0.59	396	0.64
37	0.12	77	0.21	117	0.27	157	0.34	197	0.39	237	0.45	277	0.50	317	0.55	357	0.59	397	0.64
38	0.13	78	0.21	118	0.28	158	0.34	198	0.40	238	0.45	278	0.50	318	0.55	358	0.60	398	0.64
39	0.13	79	0.21	119	0.28	159	0.34	199	0.40	239	0.45	279	0.50	319	0.55	359	0.60	399	0.64
40	0.13	80	0.21	120	0.28	160	0.34	200	0.40	240	0.45	280	0.50	320	0.55	360	0.60	400	0.64

Table 4. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife warmwater, and edw

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
1	0.09	41	3.30	81	6.41	121	9.47	161	12.50	201	15.51	241	18.49	281	21.47	321	24.42	361	27.37
2	0.17	42	3.38	82	6.49	122	9.55	162	12.58	202	15.58	242	18.57	282	21.54	322	24.50	362	27.44
3	0.26	43	3.46	83	6.57	123	9.62	163	12.65	203	15.66	243	18.64	283	21.61	323	24.57	363	27.52
4	0.34	44	3.54	84	6.64	124	9.70	164	12.73	204	15.73	244	18.72	284	21.69	324	24.64	364	27.59
5	0.42	45	3.62	85	6.72	125	9.78	165	12.80	205	15.81	245	18.79	285	21.76	325	24.72	365	27.66
6	0.51	46	3.70	86	6.80	126	9.85	166	12.88	206	15.88	246	18.87	286	21.84	326	24.79	366	27.74
7	0.59	47	3.77	87	6.87	127	9.93	167	12.95	207	15.96	247	18.94	287	21.91	327	24.87	367	27.81
8	0.67	48	3.85	88	6.95	128	10.00	168	13.03	208	16.03	248	19.02	288	21.98	328	24.94	368	27.88
9	0.75	49	3.93	89	7.03	129	10.08	169	13.10	209	16.11	249	19.09	289	22.06	329	25.01	369	27.96
10	0.83	50	4.01	90	7.10	130	10.16	170	13.18	210	16.18	250	19.16	290	22.13	330	25.09	370	28.03
11	0.92	51	4.09	91	7.18	131	10.23	171	13.25	211	16.26	251	19.24	291	22.21	331	25.16	371	28.10
12	1.00	52	4.17	92	7.26	132	10.31	172	13.33	212	16.33	252	19.31	292	22.28	332	25.23	372	28.18
13	1.08	53	4.24	93	7.33	133	10.38	173	13.40	213	16.40	253	19.39	293	22.35	333	25.31	373	28.25
14	1.16	54	4.32	94	7.41	134	10.46	174	13.48	214	16.48	254	19.46	294	22.43	334	25.38	374	28.32
15	1.24	55	4.40	95	7.49	135	10.53	175	13.56	215	16.55	255	19.54	295	22.50	335	25.46	375	28.40
16	1.32	56	4.48	96	7.56	136	10.61	176	13.63	216	16.63	256	19.61	296	22.58	336	25.53	376	28.47
17	1.40	57	4.55	97	7.64	137	10.69	177	13.71	217	16.70	257	19.68	297	22.65	337	25.60	377	28.54
18	1.48	58	4.63	98	7.72	138	10.76	178	13.78	218	16.78	258	19.76	298	22.72	338	25.68	378	28.62
19	1.56	59	4.71	99	7.79	139	10.84	179	13.86	219	16.85	259	19.83	299	22.80	339	25.75	379	28.69
20	1.64	60	4.79	100	7.87	140	10.91	180	13.93	220	16.93	260	19.91	300	22.87	340	25.82	380	28.77
21	1.72	61	4.87	101	7.95	141	10.99	181	14.01	221	17.00	261	19.98	301	22.95	341	25.90	381	28.84
22	1.80	62	4.94	102	8.02	142	11.07	182	14.08	222	17.08	262	20.06	302	23.02	342	25.97	382	28.91
23	1.88	63	5.02	103	8.10	143	11.14	183	14.16	223	17.15	263	20.13	303	23.09	343	26.05	383	28.99

Table 4. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife warmwater, and edw

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
24	1.96	64	5.10	104	8.18	144	11.22	184	14.23	224	17.23	264	20.20	304	23.17	344	26.12	384	29.06
25	2.04	65	5.18	105	8.25	145	11.29	185	14.31	225	17.30	265	20.28	305	23.24	345	26.19	385	29.13
26	2.12	66	5.25	106	8.33	146	11.37	186	14.38	226	17.38	266	20.35	306	23.32	346	26.27	386	29.21
27	2.20	67	5.33	107	8.40	147	11.44	187	14.46	227	17.45	267	20.43	307	23.39	347	26.34	387	29.28
28	2.28	68	5.41	108	8.48	148	11.52	188	14.53	228	17.53	268	20.50	308	23.46	348	26.41	388	29.35
29	2.36	69	5.49	109	8.56	149	11.59	189	14.61	229	17.60	269	20.58	309	23.54	349	26.49	389	29.43
30	2.44	70	5.56	110	8.63	150	11.67	190	14.68	230	17.67	270	20.65	310	23.61	350	26.56	390	29.50
31	2.52	71	5.64	111	8.71	151	11.75	191	14.76	231	17.75	271	20.72	311	23.69	351	26.63	391	29.57
32	2.60	72	5.72	112	8.79	152	11.82	192	14.83	232	17.82	272	20.80	312	23.76	352	26.71	392	29.65
33	2.67	73	5.79	113	8.86	153	11.90	193	14.91	233	17.90	273	20.87	313	23.83	353	26.78	393	29.72
34	2.75	74	5.87	114	8.94	154	11.97	194	14.98	234	17.97	274	20.95	314	23.91	354	26.85	394	29.79
35	2.83	75	5.95	115	9.01	155	12.05	195	15.06	235	18.05	275	21.02	315	23.98	355	26.93	395	29.87
36	2.91	76	6.03	116	9.09	156	12.12	196	15.13	236	18.12	276	21.09	316	24.05	356	27.00	396	29.94
37	2.99	77	6.10	117	9.17	157	12.20	197	15.21	237	18.20	277	21.17	317	24.13	357	27.08	397	30.01
38	3.07	78	6.18	118	9.24	158	12.27	198	15.28	238	18.27	278	21.24	318	24.20	358	27.15	398	30.08
39	3.15	79	6.26	119	9.32	159	12.35	199	15.36	239	18.35	279	21.32	319	24.28	359	27.22	399	30.16
40	3.23	80	6.33	120	9.40	160	12.43	200	15.43	240	18.42	280	21.39	320	24.35	360	27.30	400	30.23

Table 5. Chronic Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife warmwater and edw

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
1	0.02	41	0.30	81	0.48	121	0.64	161	0.78	201	0.91	241	1.03	281	1.15	321	1.26	361	1.37
2	0.04	42	0.31	82	0.49	122	0.64	162	0.78	202	0.91	242	1.04	282	1.15	322	1.26	362	1.37
3	0.05	43	0.31	83	0.49	123	0.65	163	0.79	203	0.92	243	1.04	283	1.16	323	1.27	363	1.37
4	0.06	44	0.32	84	0.50	124	0.65	164	0.79	204	0.92	244	1.04	284	1.16	324	1.27	364	1.38
5	0.07	45	0.32	85	0.50	125	0.66	165	0.79	205	0.92	245	1.05	285	1.16	325	1.27	365	1.38
6	0.08	46	0.33	86	0.51	126	0.66	166	0.80	206	0.93	246	1.05	286	1.16	326	1.27	366	1.38
7	0.09	47	0.33	87	0.51	127	0.66	167	0.80	207	0.93	247	1.05	287	1.17	327	1.28	367	1.38
8	0.10	48	0.34	88	0.51	128	0.67	168	0.80	208	0.93	248	1.05	288	1.17	328	1.28	368	1.39
9	0.10	49	0.34	89	0.52	129	0.67	169	0.81	209	0.94	249	1.06	289	1.17	329	1.28	369	1.39
10	0.11	50	0.35	90	0.52	130	0.67	170	0.81	210	0.94	250	1.06	290	1.17	330	1.28	370	1.39
11	0.12	51	0.35	91	0.53	131	0.68	171	0.81	211	0.94	251	1.06	291	1.18	331	1.29	371	1.39
12	0.13	52	0.36	92	0.53	132	0.68	172	0.82	212	0.95	252	1.07	292	1.18	332	1.29	372	1.40
13	0.14	53	0.36	93	0.53	133	0.68	173	0.82	213	0.95	253	1.07	293	1.18	333	1.29	373	1.40
14	0.14	54	0.37	94	0.54	134	0.69	174	0.82	214	0.95	254	1.07	294	1.19	334	1.30	374	1.40
15	0.15	55	0.37	95	0.54	135	0.69	175	0.83	215	0.95	255	1.07	295	1.19	335	1.30	375	1.40
16	0.16	56	0.38	96	0.55	136	0.69	176	0.83	216	0.96	256	1.08	296	1.19	336	1.30	376	1.41
17	0.16	57	0.38	97	0.55	137	0.70	177	0.83	217	0.96	257	1.08	297	1.19	337	1.30	377	1.41
18	0.17	58	0.38	98	0.55	138	0.70	178	0.84	218	0.96	258	1.08	298	1.20	338	1.31	378	1.41
19	0.18	59	0.39	99	0.56	139	0.71	179	0.84	219	0.97	259	1.09	299	1.20	339	1.31	379	1.41
20	0.18	60	0.39	100	0.56	140	0.71	180	0.84	220	0.97	260	1.09	300	1.20	340	1.31	380	1.42

Table 5. Chronic Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife warmwater and edw

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
21	0.19	61	0.40	101	0.57	141	0.71	181	0.85	221	0.97	261	1.09	301	1.21	341	1.31	381	1.42
22	0.20	62	0.40	102	0.57	142	0.72	182	0.85	222	0.98	262	1.10	302	1.21	342	1.32	382	1.42
23	0.20	63	0.41	103	0.57	143	0.72	183	0.85	223	0.98	263	1.10	303	1.21	343	1.32	383	1.42
24	0.21	64	0.41	104	0.58	144	0.72	184	0.86	224	0.98	264	1.10	304	1.21	344	1.32	384	1.43
25	0.21	65	0.42	105	0.58	145	0.73	185	0.86	225	0.99	265	1.10	305	1.22	345	1.32	385	1.43
26	0.22	66	0.42	106	0.58	146	0.73	186	0.86	226	0.99	266	1.11	306	1.22	346	1.33	386	1.43
27	0.23	67	0.42	107	0.59	147	0.73	187	0.87	227	0.99	267	1.11	307	1.22	347	1.33	387	1.43
28	0.23	68	0.43	108	0.59	148	0.74	188	0.87	228	0.99	268	1.11	308	1.22	348	1.33	388	1.44
29	0.24	69	0.43	109	0.60	149	0.74	189	0.87	229	1.00	269	1.12	309	1.23	349	1.34	389	1.44
30	0.24	70	0.44	110	0.60	150	0.74	190	0.88	230	1.00	270	1.12	310	1.23	350	1.34	390	1.44
31	0.25	71	0.44	111	0.60	151	0.75	191	0.88	231	1.00	271	1.12	311	1.23	351	1.34	391	1.44
32	0.25	72	0.45	112	0.61	152	0.75	192	0.88	232	1.01	272	1.12	312	1.24	352	1.34	392	1.45
33	0.26	73	0.45	113	0.61	153	0.75	193	0.89	233	1.01	273	1.13	313	1.24	353	1.35	393	1.45
34	0.26	74	0.46	114	0.61	154	0.76	194	0.89	234	1.01	274	1.13	314	1.24	354	1.35	394	1.45
35	0.27	75	0.46	115	0.62	155	0.76	195	0.89	235	1.02	275	1.13	315	1.24	355	1.35	395	1.46
36	0.28	76	0.46	116	0.62	156	0.76	196	0.90	236	1.02	276	1.14	316	1.25	356	1.35	396	1.46
37	0.28	77	0.47	117	0.63	157	0.77	197	0.90	237	1.02	277	1.14	317	1.25	357	1.36	397	1.46
38	0.29	78	0.47	118	0.63	158	0.77	198	0.90	238	1.02	278	1.14	318	1.25	358	1.36	398	1.46
39	0.29	79	0.48	119	0.63	159	0.77	199	0.91	239	1.03	279	1.14	319	1.26	359	1.36	399	1.47
40	0.30	80	0.48	120	0.64	160	0.78	200	0.91	240	1.03	280	1.15	320	1.26	360	1.36	400	1.47

Table 6. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife ephemeral

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
1	0.25	41	9.58	81	18.58	121	27.45	161	36.23	201	44.94	241	53.59	281	62.21	321	70.78	361	79.32
2	0.50	42	9.80	82	18.80	122	27.67	162	36.45	202	45.15	242	53.81	282	62.42	322	70.99	362	79.53
3	0.75	43	10.03	83	19.03	123	27.89	163	36.66	203	45.37	243	54.03	283	62.64	323	71.21	363	79.74
4	0.99	44	10.26	84	19.25	124	28.11	164	36.88	204	45.59	244	54.24	284	62.85	324	71.42	364	79.95
5	1.23	45	10.49	85	19.47	125	28.33	165	37.10	205	45.81	245	54.46	285	63.06	325	71.63	365	80.17
6	1.47	46	10.71	86	19.69	126	28.55	166	37.32	206	46.02	246	54.67	286	63.28	326	71.85	366	80.38
7	1.71	47	10.94	87	19.92	127	28.77	167	37.54	207	46.24	247	54.89	287	63.49	327	72.06	367	80.59
8	1.95	48	11.17	88	20.14	128	28.99	168	37.76	208	46.46	248	55.10	288	63.71	328	72.27	368	80.81
9	2.18	49	11.39	89	20.36	129	29.21	169	37.97	209	46.67	249	55.32	289	63.92	329	72.49	369	81.02
10	2.42	50	11.62	90	20.58	130	29.43	170	38.19	210	46.89	250	55.54	290	64.14	330	72.70	370	81.23
11	2.65	51	11.84	91	20.81	131	29.65	171	38.41	211	47.11	251	55.75	291	64.35	331	72.92	371	81.44
12	2.89	52	12.07	92	21.03	132	29.87	172	38.63	212	47.32	252	55.97	292	64.57	332	73.13	372	81.66
13	3.13	53	12.30	93	21.25	133	30.09	173	38.85	213	47.54	253	56.18	293	64.78	333	73.34	373	81.87
14	3.36	54	12.52	94	21.47	134	30.31	174	39.06	214	47.76	254	56.40	294	65.00	334	73.56	374	82.08
15	3.59	55	12.75	95	21.70	135	30.53	175	39.28	215	47.97	255	56.61	295	65.21	335	73.77	375	82.30
16	3.83	56	12.97	96	21.92	136	30.75	176	39.50	216	48.19	256	56.83	296	65.42	336	73.98	376	82.51
17	4.06	57	13.20	97	22.14	137	30.97	177	39.72	217	48.41	257	57.04	297	65.64	337	74.20	377	82.72
18	4.29	58	13.42	98	22.36	138	31.19	178	39.94	218	48.62	258	57.26	298	65.85	338	74.41	378	82.93

Table 6. Acute Water Quality Standards for Dissolved Cadmium Aquatic and Wildlife ephemeral

Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L	Hard. mg/L	Std. µg/L
19	4.53	59	13.65	99	22.58	139	31.41	179	40.15	219	48.84	259	57.48	299	66.07	339	74.62	379	83.15
20	4.76	60	13.87	100	22.81	140	31.63	180	40.37	220	49.06	260	57.69	300	66.28	340	74.84	380	83.36
21	4.99	61	14.10	101	23.03	141	31.85	181	40.59	221	49.27	261	57.91	301	66.50	341	75.05	381	83.57
22	5.22	62	14.32	102	23.25	142	32.07	182	40.81	222	49.49	262	58.12	302	66.71	342	75.26	382	83.78
23	5.45	63	14.55	103	z23.47	143	32.29	183	41.03	223	49.71	263	58.34	303	66.93	343	75.48	383	84.00
24	5.68	64	14.77	104	23.69	144	32.50	184	41.24	224	49.92	264	58.55	304	67.14	344	75.69	384	84.21
25	5.91	65	15.00	105	23.91	145	32.72	185	41.46	225	50.14	265	58.77	305	67.35	345	75.90	385	84.42
26	6.14	66	15.22	106	24.13	146	32.94	186	41.68	226	50.35	266	58.98	306	67.57	346	76.12	386	84.64
27	6.37	67	15.45	107	24.36	147	33.16	187	41.90	227	50.57	267	59.20	307	67.78	347	76.33	387	84.85
28	6.60	68	15.67	108	24.58	148	33.38	188	42.11	228	50.79	268	59.41	308	68.00	348	76.54	388	85.06
29	6.83	69	15.90	109	24.80	149	33.60	189	42.33	229	51.00	269	59.63	309	68.21	349	76.76	389	85.27
30	7.06	70	16.12	110	25.02	150	33.82	190	42.55	230	51.22	270	59.84	310	68.42	350	76.97	390	85.49
31	7.29	71	16.34	111	25.24	151	34.04	191	42.77	231	51.44	271	60.06	311	68.64	351	77.18	391	85.70
32	7.52	72	16.57	112	25.46	152	34.26	192	42.98	232	51.65	272	60.27	312	68.85	352	77.40	392	85.91
33	7.75	73	16.79	113	25.68	153	34.48	193	43.20	233	51.87	273	60.49	313	69.07	353	77.61	393	86.12
34	7.98	74	17.02	114	25.90	154	34.70	194	43.42	234	52.08	274	60.70	314	69.28	354	77.82	394	86.33
35	8.21	75	17.24	115	26.12	155	34.91	195	43.63	235	52.30	275	60.92	315	69.49	355	78.04	395	86.55
36	8.44	76	17.46	116	26.34	156	35.13	196	43.85	236	52.52	276	61.13	316	69.71	356	78.25	396	86.76
37	8.67	77	17.69	117	26.57	157	35.35	197	44.07	237	52.73	277	61.35	317	69.92	357	78.46	397	86.97
38	8.89	78	17.91	118	26.79	158	35.57	198	44.29	238	52.95	278	61.56	318	70.14	358	78.68	398	87.18
39	9.12	79	18.13	119	27.01	159	35.79	199	44.50	239	53.16	279	61.78	319	70.35	359	78.89	399	87.40
40	9.35	80	18.36	120	27.23	160	36.01	200	44.72	240	53.38	280	61.99	320	70.56	360	79.10	400	87.61

Table 7. Acute Water Quality Standards for ~~dissolved~~ Dissolved Chromium III
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 13	41	275	81	479	121	666	161	842	201	1009	241	1171	281	1328	321	1481	361	1630
2	~~NA~~ 23	42	280	82	484	122	671	162	846	202	1013	242	1175	282	1332	322	1485	362	1634
3	~~NA~~ 32	43	285	83	489	123	675	163	850	203	1017	243	1179	283	1336	323	1488	363	1638
4	~~NA~~ 41	44	291	84	494	124	680	164	854	204	1022	244	1183	284	1340	324	1492	364	1641
5	~~NA~~ 49	45	296	85	499	125	684	165	859	205	1026	245	1187	285	1343	325	1496	365	1645
6	~~NA~~ 57	46	302	86	504	126	688	166	863	206	1030	246	1191	286	1347	326	1500	366	1649
7	~~NA~~ 65	47	307	87	508	127	693	167	867	207	1034	247	1195	287	1351	327	1504	367	1653
8	~~NA~~ 72	48	312	88	513	128	697	168	871	208	1038	248	1199	288	1355	328	1507	368	1656
9	~~NA~~ 79	49	318	89	518	129	702	169	876	209	1042	249	1203	289	1359	329	1511	369	1660
10	~~NA~~ 86	50	323	90	523	130	706	170	880	210	1046	250	1207	290	1363	330	1515	370	1664
11	~~NA~~ 93	51	328	91	527	131	711	171	884	211	1050	251	1211	291	1367	331	1519	371	1667
12	~~NA~~ 100	52	334	92	532	132	715	172	888	212	1054	252	1215	292	1370	332	1522	372	1671
13	~~NA~~ 107	53	339	93	537	133	720	173	893	213	1058	253	1219	293	1374	333	1526	373	1675
14	~~NA~~ 114	54	344	94	542	134	724	174	897	214	1062	254	1223	294	1378	334	1530	374	1678
15	~~NA~~ 120	55	349	95	546	135	729	175	901	215	1067	255	1226	295	1382	335	1534	375	1682

Table 7. Acute Water Quality Standards for ~~dissolved~~ Dissolved Chromium III
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
16	~~NA~~ 127	56	354	96	551	136	733	176	905	216	1071	256	1230	296	1386	336	1537	376	1686
17	~~NA~~ 133	57	360	97	556	137	737	177	909	217	1075	257	1234	297	1390	337	1541	377	1689
18	~~NA~~ 140	58	365	98	560	138	742	178	914	218	1079	258	1238	298	1393	338	1545	378	1693
19	~~NA~~ 146	59	370	99	565	139	746	179	918	219	1083	259	1242	299	1397	339	1549	379	1697
20	~~NA~~ 152	60	375	100	570	140	751	180	922	220	1087	260	1246	300	1401	340	1552	380	1700
21	~~NA~~ 159	61	380	101	574	141	755	181	926	221	1091	261	1250	301	1405	341	1556	381	1704
22	~~NA~~ 165	62	385	102	579	142	759	182	930	222	1095	262	1254	302	1409	342	1560	382	1708
23	~~NA~~ 171	63	390	103	584	143	764	183	935	223	1099	263	1258	303	1413	343	1564	383	1711
24	~~NA~~ 177	64	395	104	588	144	768	184	939	224	1103	264	1262	304	1416	344	1567	384	1715
25	183	65	400	105	593	145	772	185	943	225	1107	265	1266	305	1420	345	1571	385	1719
26	189	66	405	106	598	146	777	186	947	226	1111	266	1270	306	1424	346	1575	386	1722
27	195	67	410	107	602	147	781	187	951	227	1115	267	1274	307	1428	347	1578	387	1726
28	201	68	415	108	607	148	785	188	955	228	1119	268	1277	308	1432	348	1582	388	1730
29	207	69	420	109	611	149	790	189	960	229	1123	269	1281	309	1435	349	1586	389	1733
30	213	70	425	110	616	150	794	190	964	230	1127	270	1285	310	1439	350	1590	390	1737
31	218	71	430	111	621	151	799	191	968	231	1131	271	1289	311	1443	351	1593	391	1741
32	224	72	435	112	625	152	803	192	972	232	1135	272	1293	312	1447	352	1597	392	1744
33	230	73	440	113	630	153	807	193	976	233	1139	273	1297	313	1451	353	1601	393	1748
34	235	74	445	114	634	154	811	194	980	234	1143	274	1301	314	1454	354	1604	394	1751
35	241	75	450	115	639	155	816	195	985	235	1147	275	1305	315	1458	355	1608	395	1755
36	247	76	455	116	643	156	820	196	989	236	1151	276	1309	316	1462	356	1612	396	1759
37	252	77	460	117	648	157	824	197	993	237	1155	277	1312	317	1466	357	1616	397	1762
38	258	78	465	118	652	158	829	198	997	238	1159	278	1316	318	1470	358	1619	398	1766

Table 8. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Chromium III
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 1.71	41	35.71	81	62.37	121	86.64	161	109.47	201	131.29	241	152.33	281	172.74	321	192.63	361	212.08
2	~~NA~~ 3.01	42	36.42	82	63.00	122	87.22	162	110.03	202	131.82	242	152.84	282	173.24	322	193.12	362	212.56
3	~~NA~~ 4.19	43	37.13	83	63.63	123	87.81	163	110.58	203	132.36	243	153.36	283	173.75	323	193.62	363	213.04
4	~~NA~~ 5.31	44	37.83	84	64.25	124	88.39	164	111.14	204	132.89	244	153.88	284	174.25	324	194.11	364	213.52
5	~~NA~~ 6.37	45	38.54	85	64.88	125	88.98	165	111.69	205	133.42	245	154.39	285	174.75	325	194.60	365	214.00
6	~~NA~~ 7.40	46	39.24	86	65.50	126	89.56	166	112.25	206	133.96	246	154.91	286	175.25	326	195.09	366	214.48
7	~~NA~~ 8.40	47	39.93	87	66.13	127	90.14	167	112.80	207	134.49	247	155.43	287	175.76	327	195.58	367	214.96
8	~~NA~~ 9.37	48	40.63	88	66.75	128	90.72	168	113.35	208	135.02	248	155.94	288	176.26	328	196.07	368	215.44
9	~~NA~~ 10.31	49	41.32	89	67.37	129	91.30	169	113.90	209	135.55	249	156.46	289	176.76	329	196.56	369	215.92
10	~~NA~~ 11.24	50	42.01	90	67.99	130	91.88	170	114.46	210	136.08	250	156.97	290	177.26	330	197.05	370	216.40
11	~~NA~~ 12.16	51	42.70	91	68.61	131	92.46	171	115.01	211	136.61	251	157.48	291	177.76	331	197.53	371	216.88
12	~~NA~~ 13.05	52	43.38	92	69.22	132	93.04	172	115.56	212	137.14	252	158.00	292	178.26	332	198.02	372	217.36
13	~~NA~~ 13.94	53	44.06	93	69.84	133	93.61	173	116.11	213	137.67	253	158.51	293	178.76	333	198.51	373	217.84
14	~~NA~~ 14.81	54	44.74	94	70.45	134	94.19	174	116.66	214	138.20	254	159.02	294	179.26	334	199.00	374	218.32
15	~~NA~~ 15.67	55	45.42	95	71.07	135	94.76	175	117.21	215	138.73	255	159.54	295	179.76	335	199.49	375	218.79
16	~~NA~~ 16.52	56	46.10	96	71.68	136	95.34	176	117.75	216	139.26	256	160.05	296	180.26	336	199.97	376	219.27

Table 8. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Chromium III
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
17	~~NA~~ 17.36	57	46.77	97	72.29	137	95.91	177	118.30	217	139.79	257	160.56	297	180.76	337	200.46	377	219.75
18	~~NA~~ 18.20	58	47.44	98	72.90	138	96.49	178	118.85	218	140.31	258	161.07	298	181.25	338	200.95	378	220.23
19	~~NA~~ 19.02	59	48.11	99	73.51	139	97.06	179	119.40	219	140.84	259	161.58	299	181.75	339	201.44	379	220.70
20	~~NA~~ 19.84	60	48.78	100	74.11	140	97.63	180	119.94	220	141.37	260	162.09	300	182.25	340	201.92	380	221.18
21	~~NA~~ 20.64	61	49.44	101	74.72	141	98.20	181	120.49	221	141.89	261	162.60	301	182.75	341	202.41	381	221.66
22	~~NA~~ 21.45	62	50.10	102	75.33	142	98.77	182	121.03	222	142.42	262	163.11	302	183.24	342	202.89	382	222.13
23	~~NA~~ 22.24	63	50.76	103	75.93	143	99.34	183	121.58	223	142.94	263	163.62	303	183.74	343	203.38	383	222.61
24	~~NA~~ 23.03	64	51.42	104	76.53	144	99.91	184	122.12	224	143.47	264	164.13	304	184.24	344	203.87	384	223.09
25	23.81	65	52.08	105	77.14	145	100.48	185	122.66	225	143.99	265	164.64	305	184.73	345	204.35	385	223.56
26	24.59	66	52.74	106	77.74	146	101.04	186	123.21	226	144.52	266	165.15	306	185.23	346	204.84	386	224.04
27	25.36	67	53.39	107	78.34	147	101.61	187	123.75	227	145.04	267	165.66	307	185.72	347	205.32	387	224.51
28	26.13	68	54.04	108	78.94	148	102.18	188	124.29	228	145.56	268	166.17	308	186.22	348	205.81	388	224.99
29	26.89	69	54.69	109	79.53	149	102.74	189	124.83	229	146.09	269	166.67	309	186.72	349	206.29	389	225.46
30	27.65	70	55.34	110	80.13	150	103.31	190	125.37	230	146.61	270	167.18	310	187.21	350	206.77	390	225.94
31	28.40	71	55.99	111	80.73	151	103.87	191	125.91	231	147.13	271	167.69	311	187.70	351	207.26	391	226.41
32	29.15	72	56.63	112	81.32	152	104.43	192	126.45	232	147.65	272	168.20	312	188.20	352	207.74	392	226.88
33	29.89	73	57.27	113	81.92	153	104.99	193	126.99	233	148.17	273	168.70	313	188.69	353	208.22	393	227.36
34	30.63	74	57.92	114	82.51	154	105.56	194	127.53	234	148.69	274	169.21	314	189.19	354	208.71	394	227.83
35	31.37	75	58.56	115	83.10	155	106.12	195	128.07	235	149.21	275	169.71	315	189.68	355	209.19	395	228.31
36	32.10	76	59.20	116	83.69	156	106.68	196	128.61	236	149.73	276	170.22	316	190.17	356	209.67	396	228.78
37	32.83	77	59.83	117	84.28	157	107.24	197	129.14	237	150.25	277	170.72	317	190.66	357	210.15	397	229.25
38	33.55	78	60.47	118	84.87	158	107.80	198	129.68	238	150.77	278	171.23	318	191.16	358	210.64	398	229.72
39	34.28	79	61.10	119	85.46	159	108.35	199	130.22	239	151.29	279	171.73	319	191.65	359	211.12	399	230.20
40	34.99	80	61.74	120	86.05	160	108.91	200	130.75	240	151.81	280	172.24	320	192.14	360	211.60	400	230.67

~~Table 6.~~Table 9. Acute Water Quality Standards for ~~dissolved~~ Dissolved Chromium III
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 44	41	921	81	1609	121	2235	161	2824	201	3386	241	3929	281	4456	321	4969	361	5470
2	~~NA~~ 78	42	939	82	1625	122	2250	162	2838	202	3400	242	3942	282	4469	322	4981	362	5483
3	~~NA~~ 108	43	958	83	1641	123	2265	163	2852	203	3414	243	3956	283	4481	323	4994	363	5495
4	~~NA~~ 137	44	976	84	1657	124	2280	164	2867	204	3428	244	3969	284	4494	324	5007	364	5507
5	~~NA~~ 164	45	994	85	1673	125	2295	165	2881	205	3441	245	3982	285	4507	325	5019	365	5520
6	~~NA~~ 191	46	1012	86	1690	126	2310	166	2895	206	3455	246	3996	286	4520	326	5032	366	5532
7	~~NA~~ 217	47	1030	87	1706	127	2325	167	2909	207	3469	247	4009	287	4533	327	5045	367	5545
8	~~NA~~ 242	48	1048	88	1722	128	2340	168	2924	208	3483	248	4022	288	4546	328	5057	368	5557
9	~~NA~~ 266	49	1066	89	1738	129	2355	169	2938	209	3496	249	4035	289	4559	329	5070	369	5569
10	~~NA~~ 290	50	1084	90	1754	130	2370	170	2952	210	3510	250	4049	290	4572	330	5082	370	5582
11	~~NA~~ 314	51	1101	91	1770	131	2385	171	2966	211	3524	251	4062	291	4585	331	5095	371	5594
12	~~NA~~ 337	52	1119	92	1785	132	2400	172	2981	212	3537	252	4075	292	4598	332	5108	372	5606
13	~~NA~~ 360	53	1137	93	1801	133	2415	173	2995	213	3551	253	4088	293	4611	333	5120	373	5619
14	~~NA~~ 382	54	1154	94	1817	134	2429	174	3009	214	3565	254	4102	294	4624	334	5133	374	5631
15	~~NA~~ 404	55	1172	95	1833	135	2444	175	3023	215	3578	255	4115	295	4637	335	5145	375	5643
16	~~NA~~ 426	56	1189	96	1849	136	2459	176	3037	216	3592	256	4128	296	4649	336	5158	376	5656
17	~~NA~~ 448	57	1206	97	1865	137	2474	177	3051	217	3606	257	4141	297	4662	337	5171	377	5668
18	~~NA~~ 469	58	1224	98	1880	138	2489	178	3066	218	3619	258	4155	298	4675	338	5183	378	5680
19	~~NA~~ 491	59	1241	99	1896	139	2503	179	3080	219	3633	259	4168	299	4688	339	5196	379	5693
20	~~NA~~ 512	60	1258	100	1912	140	2518	180	3094	220	3646	260	4181	300	4701	340	5208	380	5705
21	~~NA~~ 532	61	1275	101	1927	141	2533	181	3108	221	3660	261	4194	301	4714	341	5221	381	5717
22	~~NA~~ 553	62	1292	102	1943	142	2548	182	3122	222	3673	262	4207	302	4726	342	5233	382	5730
23	~~NA~~ 574	63	1309	103	1958	143	2562	183	3136	223	3687	263	4220	303	4739	343	5246	383	5742
24	~~NA~~ 594	64	1326	104	1974	144	2577	184	3150	224	3701	264	4234	304	4752	344	5258	384	5754
25	614	65	1343	105	1990	145	2592	185	3164	225	3714	265	4247	305	4765	345	5271	385	5766
26	634	66	1360	106	2005	146	2606	186	3178	226	3728	266	4260	306	4778	346	5283	386	5779
27	654	67	1377	107	2021	147	2621	187	3192	227	3741	267	4273	307	4790	347	5296	387	5791
28	674	68	1394	108	2036	148	2635	188	3206	228	3755	268	4286	308	4803	348	5308	388	5803
29	694	69	1411	109	2051	149	2650	189	3220	229	3768	269	4299	309	4816	349	5321	389	5815
30	713	70	1427	110	2067	150	2665	190	3234	230	3781	270	4312	310	4829	350	5333	390	5828
31	733	71	1444	111	2082	151	2679	191	3248	231	3795	271	4325	311	4841	351	5346	391	5840

~~Table 6.~~Table 9. Acute Water Quality Standards for ~~dissolved~~ Dissolved Chromium III
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
32	752	72	1461	112	2098	152	2694	192	3262	232	3808	272	4338	312	4854	352	5358	392	5852
33	771	73	1477	113	2113	153	2708	193	3276	233	3822	273	4351	313	4867	353	5371	393	5864
34	790	74	1494	114	2128	154	2723	194	3289	234	3835	274	4364	314	4880	354	5383	394	5877
35	809	75	1510	115	2143	155	2737	195	3303	235	3849	275	4377	315	4892	355	5396	395	5889
36	828	76	1527	116	2159	156	2752	196	3317	236	3862	276	4390	316	4905	356	5408	396	5901
37	847	77	1543	117	2174	157	2766	197	3331	237	3875	277	4404	317	4918	357	5421	397	5913
38	865	78	1560	118	2189	158	2780	198	3345	238	3889	278	4417	318	4931	358	5433	398	5925
39	884	79	1576	119	2204	159	2795	199	3359	239	3902	279	4430	319	4943	359	5445	399	5938
40	903	80	1592	120	2220	160	2809	200	3372	240	3916	280	4443	320	4956	360	5458	400	5950

~~Table 11.~~Table 10. Acute Water Quality Standards for ~~dissolved~~ Dissolved Copper
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 0.18	41	5.80	81	11.02	121	16.08	161	21.05	201	25.94	241	30.78	281	35.57	321	40.33	361	45.05
2	~~NA~~ 0.34	42	5.93	82	11.15	122	16.21	162	21.17	202	26.07	242	30.90	282	35.69	322	40.45	362	45.16
3	~~NA~~ 0.49	43	6.07	83	11.28	123	16.33	163	21.30	203	26.19	243	31.02	283	35.81	323	40.56	363	45.28
4	~~NA~~ 0.65	44	6.20	84	11.40	124	16.46	164	21.42	204	26.31	244	31.14	284	35.93	324	40.68	364	45.40
5	~~NA~~ 0.80	45	6.33	85	11.53	125	16.58	165	21.54	205	26.43	245	31.26	285	36.05	325	40.80	365	45.52
6	~~NA~~ 0.95	46	6.47	86	11.66	126	16.71	166	21.66	206	26.55	246	31.38	286	36.17	326	40.92	366	45.63
7	~~NA~~ 1.10	47	6.60	87	11.79	127	16.83	167	21.79	207	26.67	247	31.50	287	36.29	327	41.04	367	45.75
8	~~NA~~ 1.24	48	6.73	88	11.91	128	16.96	168	21.91	208	26.79	248	31.62	288	36.41	328	41.16	368	45.87
9	~~NA~~ 1.39	49	6.86	89	12.04	129	17.08	169	22.03	209	26.92	249	31.74	289	36.53	329	41.27	369	45.99
10	~~NA~~ 1.54	50	6.99	90	12.17	130	17.21	170	22.16	210	27.04	250	31.86	290	36.65	330	41.39	370	46.10
11	~~NA~~ 1.68	51	7.13	91	12.30	131	17.33	171	22.28	211	27.16	251	31.98	291	36.77	331	41.51	371	46.22
12	~~NA~~ 1.82	52	7.26	92	12.42	132	17.46	172	22.40	212	27.28	252	32.10	292	36.89	332	41.63	372	46.34
13	~~NA~~ 1.97	53	7.39	93	12.55	133	17.58	173	22.52	213	27.40	253	32.22	293	37.00	333	41.75	373	46.46
14	~~NA~~ 2.11	54	7.52	94	12.68	134	17.71	174	22.65	214	27.52	254	32.34	294	37.12	334	41.86	374	46.57
15	~~NA~~ 2.25	55	7.65	95	12.81	135	17.83	175	22.77	215	27.64	255	32.46	295	37.24	335	41.98	375	46.69
16	~~NA~~ 2.39	56	7.78	96	12.93	136	17.96	176	22.89	216	27.76	256	32.58	296	37.36	336	42.10	376	46.81
17	~~NA~~ 2.53	57	7.91	97	13.06	137	18.08	177	23.02	217	27.89	257	32.70	297	37.48	337	42.22	377	46.92
18	~~NA~~ 2.67	58	8.04	98	13.19	138	18.20	178	23.14	218	28.01	258	32.82	298	37.60	338	42.34	378	47.04
19	~~NA~~ 2.81	59	8.17	99	13.31	139	18.33	179	23.26	219	28.13	259	32.94	299	37.72	339	42.45	379	47.16
20	~~NA~~ 2.95	60	8.31	100	13.44	140	18.45	180	23.38	220	28.25	260	33.06	300	37.84	340	42.57	380	47.28
21	~~NA~~ 3.09	61	8.44	101	13.57	141	18.58	181	23.50	221	28.37	261	33.18	301	37.96	341	42.69	381	47.39
22	~~NA~~ 3.23	62	8.57	102	13.69	142	18.70	182	23.63	222	28.49	262	33.30	302	38.07	342	42.81	382	47.51
23	~~NA~~ 3.37	63	8.70	103	13.82	143	18.82	183	23.75	223	28.61	263	33.42	303	38.19	343	42.93	383	47.63
24	~~NA~~ 3.50	64	8.83	104	13.95	144	18.95	184	23.87	224	28.73	264	33.54	304	38.31	344	43.04	384	47.74
25	3.64	65	8.96	105	14.07	145	19.07	185	23.99	225	28.85	265	33.66	305	38.43	345	43.16	385	47.86
26	3.78	66	9.09	106	14.20	146	19.20	186	24.12	226	28.97	266	33.78	306	38.55	346	43.28	386	47.98
27	3.91	67	9.22	107	14.32	147	19.32	187	24.24	227	29.09	267	33.90	307	38.67	347	43.40	387	48.10
28	4.05	68	9.34	108	14.45	148	19.44	188	24.36	228	29.22	268	34.02	308	38.79	348	43.52	388	48.21
29	4.19	69	9.47	109	14.58	149	19.57	189	24.48	229	29.34	269	34.14	309	38.91	349	43.63	389	48.33

~~Table 11.~~Table 10. Acute Water Quality Standards for ~~dissolved~~ Dissolved Copper
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
30	4.32	70	9.60	110	14.70	150	19.69	190	24.60	230	29.46	270	34.26	310	39.02	350	43.75	390	48.45
31	4.46	71	9.73	111	14.83	151	19.82	191	24.73	231	29.58	271	34.38	311	39.14	351	43.87	391	48.56
32	4.59	72	9.86	112	14.95	152	19.94	192	24.85	232	29.70	272	34.50	312	39.26	352	43.99	392	48.68
33	4.73	73	9.99	113	15.08	153	20.06	193	24.97	233	29.82	273	34.62	313	39.38	353	44.10	393	48.80
34	4.86	74	10.12	114	15.20	154	20.19	194	25.09	234	29.94	274	34.74	314	39.50	354	44.22	394	48.92
35	5.00	75	10.25	115	15.33	155	20.31	195	25.21	235	30.06	275	34.86	315	39.62	355	44.34	395	49.03
36	5.13	76	10.38	116	15.46	156	20.43	196	25.34	236	30.18	276	34.98	316	39.74	356	44.46	396	49.15
37	5.27	77	10.51	117	15.58	157	20.56	197	25.46	237	30.30	277	35.10	317	39.85	357	44.58	397	49.27
38	5.40	78	10.63	118	15.71	158	20.68	198	25.58	238	30.42	278	35.22	318	39.97	358	44.69	398	49.38
39	5.53	79	10.76	119	15.83	159	20.80	199	25.70	239	30.54	279	35.34	319	40.09	359	44.81	399	49.50
40	5.67	80	10.89	120	15.96	160	20.93	200	25.82	240	30.66	280	35.46	320	40.21	360	44.93	400	49.62

~~Table 9.~~ Table11. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Copper
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 0.18	41	4.18	81	7.48	121	10.54	161	13.45	201	16.26	241	18.99	281	21.65	321	24.26	361	26.82
2	~~NA~~ 0.32	42	4.27	82	7.56	122	10.61	162	13.52	202	16.33	242	19.06	282	21.72	322	24.33	362	26.89
3	~~NA~~ 0.45	43	4.35	83	7.64	123	10.69	163	13.60	203	16.40	243	19.13	283	21.78	323	24.39	363	26.95
4	~~NA~~ 0.57	44	4.44	84	7.72	124	10.76	164	13.67	204	16.47	244	19.19	284	21.85	324	24.45	364	27.01
5	~~NA~~ 0.69	45	4.53	85	7.79	125	10.84	165	13.74	205	16.54	245	19.26	285	21.92	325	24.52	365	27.08
6	~~NA~~ 0.81	46	4.61	86	7.87	126	10.91	166	13.81	206	16.61	246	19.33	286	21.98	326	24.58	366	27.14
7	~~NA~~ 0.92	47	4.70	87	7.95	127	10.99	167	13.88	207	16.68	247	19.39	287	22.05	327	24.65	367	27.20
8	~~NA~~ 1.03	48	4.78	88	8.03	128	11.06	168	13.95	208	16.75	248	19.46	288	22.11	328	24.71	368	27.27
9	~~NA~~ 1.14	49	4.87	89	8.11	129	11.13	169	14.02	209	16.81	249	19.53	289	22.18	329	24.78	369	27.33
10	~~NA~~ 1.25	50	4.95	90	8.18	130	11.21	170	14.09	210	16.88	250	19.59	290	22.24	330	24.84	370	27.39
11	~~NA~~ 1.36	51	5.04	91	8.26	131	11.28	171	14.16	211	16.95	251	19.66	291	22.31	331	24.91	371	27.46
12	~~NA~~ 1.46	52	5.12	92	8.34	132	11.35	172	14.24	212	17.02	252	19.73	292	22.38	332	24.97	372	27.52
13	~~NA~~ 1.57	53	5.21	93	8.42	133	11.43	173	14.31	213	17.09	253	19.80	293	22.44	333	25.03	373	27.58
14	~~NA~~ 1.67	54	5.29	94	8.49	134	11.50	174	14.38	214	17.16	254	19.86	294	22.51	334	25.10	374	27.65
15	~~NA~~ 1.77	55	5.37	95	8.57	135	11.57	175	14.45	215	17.23	255	19.93	295	22.57	335	25.16	375	27.71
16	~~NA~~ 1.87	56	5.46	96	8.65	136	11.65	176	14.52	216	17.29	256	20.00	296	22.64	336	25.23	376	27.77
17	~~NA~~ 1.97	57	5.54	97	8.73	137	11.72	177	14.59	217	17.36	257	20.06	297	22.70	337	25.29	377	27.83
18	~~NA~~ 2.07	58	5.62	98	8.80	138	11.79	178	14.66	218	17.43	258	20.13	298	22.77	338	25.35	378	27.90
19	~~NA~~ 2.17	59	5.71	99	8.88	139	11.87	179	14.73	219	17.50	259	20.20	299	22.83	339	25.42	379	27.96
20	~~NA~~ 2.26	60	5.79	100	8.96	140	11.94	180	14.80	220	17.57	260	20.26	300	22.90	340	25.48	380	28.02
21	~~NA~~ 2.36	61	5.87	101	9.03	141	12.01	181	14.87	221	17.64	261	20.33	301	22.96	341	25.55	381	28.09
22	~~NA~~ 2.46	62	5.95	102	9.11	142	12.08	182	14.94	222	17.70	262	20.40	302	23.03	342	25.61	382	28.15
23	~~NA~~ 2.55	63	6.03	103	9.18	143	12.16	183	15.01	223	17.77	263	20.46	303	23.09	343	25.68	383	28.21
24	~~NA~~ 2.65	64	6.12	104	9.26	144	12.23	184	15.08	224	17.84	264	20.53	304	23.16	344	25.74	384	28.28
25	2.74	65	6.20	105	9.34	145	12.30	185	15.15	225	17.91	265	20.60	305	23.22	345	25.80	385	28.34
26	2.83	66	6.28	106	9.41	146	12.37	186	15.22	226	17.98	266	20.66	306	23.29	346	25.87	386	28.40
27	2.93	67	6.36	107	9.49	147	12.45	187	15.29	227	18.04	267	20.73	307	23.35	347	25.93	387	28.46

~~Table 9.~~ Table11. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Copper
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
28	3.02	68	6.44	108	9.56	148	12.52	188	15.36	228	18.11	268	20.79	308	23.42	348	25.99	388	28.53
29	3.11	69	6.52	109	9.64	149	12.59	189	15.43	229	18.18	269	20.86	309	23.48	349	26.06	389	28.59
30	3.20	70	6.60	110	9.72	150	12.66	190	15.50	230	18.25	270	20.93	310	23.55	350	26.12	390	28.65
31	3.29	71	6.68	111	9.79	151	12.74	191	15.57	231	18.32	271	20.99	311	23.61	351	26.19	391	28.72
32	3.38	72	6.76	112	9.87	152	12.81	192	15.64	232	18.38	272	21.06	312	23.68	352	26.25	392	28.78
33	3.47	73	6.84	113	9.94	153	12.88	193	15.71	233	18.45	273	21.13	313	23.74	353	26.31	393	28.84
34	3.56	74	6.92	114	10.02	154	12.95	194	15.78	234	18.52	274	21.19	314	23.81	354	26.38	394	28.90
35	3.65	75	7.00	115	10.09	155	13.02	195	15.85	235	18.59	275	21.26	315	23.87	355	26.44	395	28.97
36	3.74	76	7.08	116	10.17	156	13.10	196	15.92	236	18.65	276	21.32	316	23.94	356	26.50	396	29.03
37	3.83	77	7.16	117	10.24	157	13.17	197	15.99	237	18.72	277	21.39	317	24.00	357	26.57	397	29.09
38	3.92	78	7.24	118	10.32	158	13.24	198	16.05	238	18.79	278	21.46	318	24.07	358	26.63	398	29.15
39	4.01	79	7.32	119	10.39	159	13.31	199	16.12	239	18.86	279	21.52	319	24.13	359	26.70	399	29.22
40	4.09	80	7.40	120	10.47	160	13.38	200	16.19	240	18.92	280	21.59	320	24.20	360	26.76	400	29.28

~~Table 10.~~ Table 12. Acute Water Quality Standards for ~~dissolved~~ Dissolved Copper
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 0.30	41	10.04	81	19.07	121	27.84	161	36.43	201	44.91	241	53.28	281	61.57	321	69.80	361	77.97
2	~~NA~~ 0.58	42	10.27	82	19.29	122	28.05	162	36.65	202	45.12	242	53.49	282	61.78	322	70.00	362	78.17
3	~~NA~~ 0.85	43	10.50	83	19.52	123	28.27	163	36.86	203	45.33	243	53.70	283	61.99	323	70.21	363	78.37
4	~~NA~~ 1.12	44	10.73	84	19.74	124	28.49	164	37.07	204	45.54	244	53.90	284	62.19	324	70.41	364	78.58
5	~~NA~~ 1.38	45	10.96	85	19.96	125	28.70	165	37.29	205	45.75	245	54.11	285	62.40	325	70.62	365	78.78
6	~~NA~~ 1.64	46	11.19	86	20.18	126	28.92	166	37.50	206	45.96	246	54.32	286	62.61	326	70.82	366	78.98
7	~~NA~~ 1.90	47	11.42	87	20.40	127	29.14	167	37.71	207	46.17	247	54.53	287	62.81	327	71.03	367	79.19
8	~~NA~~ 2.15	48	11.65	88	20.62	128	29.35	168	37.92	208	46.38	248	54.74	288	63.02	328	71.23	368	79.39
9	~~NA~~ 2.41	49	11.88	89	20.84	129	29.57	169	38.14	209	46.59	249	54.94	289	63.22	329	71.44	369	79.59
10	~~NA~~ 2.66	50	12.11	90	21.06	130	29.78	170	38.35	210	46.80	250	55.15	290	63.43	330	71.64	370	79.80
11	~~NA~~ 2.91	51	12.33	91	21.28	131	30.00	171	38.56	211	47.01	251	55.36	291	63.64	331	71.85	371	80.00
12	~~NA~~ 3.16	52	12.56	92	21.50	132	30.22	172	38.77	212	47.22	252	55.57	292	63.84	332	72.05	372	80.20
13	~~NA~~ 3.40	53	12.79	93	21.72	133	30.43	173	38.99	213	47.43	253	55.78	293	64.05	333	72.26	373	80.41
14	~~NA~~ 3.65	54	13.02	94	21.94	134	30.65	174	39.20	214	47.64	254	55.98	294	64.25	334	72.46	374	80.61
15	~~NA~~ 3.89	55	13.24	95	22.16	135	30.86	175	39.41	215	47.85	255	56.19	295	64.46	335	72.66	375	80.81
16	~~NA~~ 4.14	56	13.47	96	22.38	136	31.08	176	39.62	216	48.06	256	56.40	296	64.67	336	72.87	376	81.02
17	~~NA~~ 4.38	57	13.70	97	22.60	137	31.29	177	39.84	217	48.27	257	56.61	297	64.87	337	73.07	377	81.22
18	~~NA~~ 4.62	58	13.92	98	22.82	138	31.51	178	40.05	218	48.48	258	56.81	298	65.08	338	73.28	378	81.42
19	~~NA~~ 4.86	59	14.15	99	23.04	139	31.72	179	40.26	219	48.68	259	57.02	299	65.28	339	73.48	379	81.62
20	~~NA~~ 5.11	60	14.37	100	23.26	140	31.94	180	40.47	220	48.89	260	57.23	300	65.49	340	73.69	380	81.83
21	~~NA~~ 5.35	61	14.60	101	23.48	141	32.15	181	40.68	221	49.10	261	57.44	301	65.69	341	73.89	381	82.03
22	~~NA~~ 5.59	62	14.83	102	23.70	142	32.37	182	40.89	222	49.31	262	57.64	302	65.90	342	74.09	382	82.23
23	~~NA~~ 5.82	63	15.05	103	23.92	143	32.58	183	41.11	223	49.52	263	57.85	303	66.11	343	74.30	383	82.44
24	~~NA~~ 6.06	64	15.28	104	24.14	144	32.80	184	41.32	224	49.73	264	58.06	304	66.31	344	74.50	384	82.64
25	6.30	65	15.50	105	24.36	145	33.01	185	41.53	225	49.94	265	58.26	305	66.52	345	74.71	385	82.84

~~Table 10.~~Table 12. Acute Water Quality Standards for ~~dissolved~~ Dissolved Copper
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
26	6.54	66	15.73	106	24.57	146	33.23	186	41.74	226	50.15	266	58.47	306	66.72	346	74.91	386	83.04
27	6.77	67	15.95	107	24.79	147	33.44	187	41.95	227	50.36	267	58.68	307	66.93	347	75.11	387	83.25
28	7.01	68	16.17	108	25.01	148	33.65	188	42.16	228	50.57	268	58.89	308	67.13	348	75.32	388	83.45
29	7.25	69	16.40	109	25.23	149	33.87	189	42.37	229	50.78	269	59.09	309	67.34	349	75.52	389	83.65
30	7.48	70	16.62	110	25.45	150	34.08	190	42.59	230	50.99	270	59.30	310	67.54	350	75.73	390	83.85
31	7.72	71	16.85	111	25.66	151	34.30	191	42.80	231	51.19	271	59.51	311	67.75	351	75.93	391	84.06
32	7.95	72	17.07	112	25.88	152	34.51	192	43.01	232	51.40	272	59.71	312	67.95	352	76.13	392	84.26
33	8.18	73	17.29	113	26.10	153	34.72	193	43.22	233	51.61	273	59.92	313	68.16	353	76.34	393	84.46
34	8.42	74	17.52	114	26.32	154	34.94	194	43.43	234	51.82	274	60.13	314	68.36	354	76.54	394	84.66
35	8.65	75	17.74	115	26.53	155	35.15	195	43.64	235	52.03	275	60.33	315	68.57	355	76.74	395	84.87
36	8.88	76	17.96	116	26.75	156	35.37	196	43.85	236	52.24	276	60.54	316	68.77	356	76.95	396	85.07
37	9.12	77	18.18	117	26.97	157	35.58	197	44.06	237	52.45	277	60.75	317	68.98	357	77.15	397	85.27
38	9.35	78	18.41	118	27.19	158	35.79	198	44.27	238	52.65	278	60.95	318	69.18	358	77.36	398	85.47
39	9.58	79	18.63	119	27.40	159	36.01	199	44.48	239	52.86	279	61.16	319	69.39	359	77.56	399	85.68
40	9.81	80	18.85	120	27.62	160	36.22	200	44.69	240	53.07	280	61.37	320	69.59	360	77.76	400	85.88

~~Table 14.~~Table 13. Acute Water Quality Standards for ~~dissolved~~ Dissolved Lead
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 0.34	41	24.17	81	51.30	121	79.43	161	108.02	201	136.86	241	165.82	281	194.81	321	223.79	361	252.72
2	~~NA~~ 0.76	42	24.82	82	52.00	122	80.14	162	108.74	202	137.59	242	166.55	282	195.54	322	224.52	362	253.44
3	~~NA~~ 1.22	43	25.48	83	52.69	123	80.85	163	109.46	203	138.31	243	167.27	283	196.26	323	225.24	363	254.16
4	~~NA~~ 1.71	44	26.14	84	53.39	124	81.56	164	110.18	204	139.03	244	167.99	284	196.99	324	225.96	364	254.89
5	~~NA~~ 2.21	45	26.81	85	54.08	125	82.27	165	110.90	205	139.76	245	168.72	285	197.71	325	226.69	365	255.61
6	~~NA~~ 2.73	46	27.47	86	54.78	126	82.98	166	111.62	206	140.48	246	169.44	286	198.44	326	227.41	366	256.33
7	~~NA~~ 3.26	47	28.13	87	55.48	127	83.69	167	112.34	207	141.20	247	170.17	287	199.16	327	228.14	367	257.05
8	~~NA~~ 3.80	48	28.80	88	56.17	128	84.41	168	113.06	208	141.93	248	170.89	288	199.89	328	228.86	368	257.77
9	~~NA~~ 4.35	49	29.47	89	56.87	129	85.12	169	113.78	209	142.65	249	171.62	289	200.61	329	229.58	369	258.50
10	~~NA~~ 4.91	50	30.14	90	57.57	130	85.83	170	114.50	210	143.37	250	172.34	290	201.34	330	230.31	370	259.22
11	~~NA~~ 5.47	51	30.81	91	58.27	131	86.54	171	115.22	211	144.10	251	173.07	291	202.06	331	231.03	371	259.94
12	~~NA~~ 6.04	52	31.48	92	58.97	132	87.26	172	115.94	212	144.82	252	173.79	292	202.79	332	231.75	372	260.66
13	~~NA~~ 6.62	53	32.15	93	59.67	133	87.97	173	116.66	213	145.54	253	174.52	293	203.51	333	232.48	373	261.38
14	~~NA~~ 7.20	54	32.82	94	60.37	134	88.68	174	117.38	214	146.27	254	175.24	294	204.24	334	233.20	374	262.10
15	~~NA~~ 7.79	55	33.49	95	61.07	135	89.40	175	118.10	215	146.99	255	175.97	295	204.96	335	233.92	375	262.83
16	~~NA~~ 8.38	56	34.17	96	61.77	136	90.11	176	118.82	216	147.71	256	176.69	296	205.69	336	234.65	376	263.55
17	~~NA~~ 8.98	57	34.84	97	62.47	137	90.83	177	119.54	217	148.44	257	177.42	297	206.41	337	235.37	377	264.27
18	~~NA~~ 9.58	58	35.52	98	63.18	138	91.54	178	120.26	218	149.16	258	178.14	298	207.13	338	236.09	378	264.99
19	~~NA~~ 10.18	59	36.20	99	63.88	139	92.25	179	120.98	219	149.89	259	178.87	299	207.86	339	236.82	379	265.71
20	~~NA~~ 10.79	60	36.88	100	64.58	140	92.97	180	121.70	220	150.61	260	179.59	300	208.58	340	237.54	380	266.43
21	~~NA~~ 11.40	61	37.56	101	65.28	141	93.68	181	122.42	221	151.33	261	180.32	301	209.31	341	238.26	381	267.15
22	~~NA~~ 12.02	62	38.24	102	65.99	142	94.40	182	123.14	222	152.06	262	181.04	302	210.03	342	238.99	382	267.88
23	~~NA~~ 12.64	63	38.92	103	66.69	143	95.12	183	123.87	223	152.78	263	181.77	303	210.76	343	239.71	383	268.60

~~Table 14.~~Table 13. Acute Water Quality Standards for ~~dissolved~~ Dissolved Lead
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
24	~~NA~~ 13.26	64	39.60	104	67.40	144	95.83	184	124.59	224	153.51	264	182.49	304	211.48	344	240.43	384	269.32
25	13.88	65	40.28	105	68.10	145	96.55	185	125.31	225	154.23	265	183.22	305	212.21	345	241.16	385	270.04
26	14.51	66	40.97	106	68.81	146	97.26	186	126.03	226	154.95	266	183.94	306	212.93	346	241.88	386	270.76
27	15.14	67	41.65	107	69.51	147	97.98	187	126.75	227	155.68	267	184.67	307	213.65	347	242.60	387	271.48
28	15.77	68	42.33	108	70.22	148	98.70	188	127.47	228	156.40	268	185.39	308	214.38	348	243.33	388	272.20
29	16.40	69	43.02	109	70.93	149	99.41	189	128.20	229	157.13	269	186.12	309	215.10	349	244.05	389	272.92
30	17.04	70	43.71	110	71.63	150	100.13	190	128.92	230	157.85	270	186.84	310	215.83	350	244.77	390	273.64
31	17.68	71	44.39	111	72.34	151	100.85	191	129.64	231	158.58	271	187.57	311	216.55	351	245.49	391	274.36
32	18.32	72	45.08	112	73.05	152	101.56	192	130.36	232	159.30	272	188.29	312	217.28	352	246.22	392	275.08
33	18.96	73	45.77	113	73.75	153	102.28	193	131.08	233	160.02	273	189.02	313	218.00	353	246.94	393	275.80
34	19.61	74	46.46	114	74.46	154	103.00	194	131.81	234	160.75	274	189.74	314	218.72	354	247.66	394	276.52
35	20.25	75	47.15	115	75.17	155	103.72	195	132.53	235	161.47	275	190.47	315	219.45	355	248.38	395	277.25
36	20.90	76	47.84	116	75.88	156	104.43	196	133.25	236	162.20	276	191.19	316	220.17	356	249.11	396	277.97
37	21.55	77	48.53	117	76.59	157	105.15	197	133.97	237	162.92	277	191.92	317	220.90	357	249.83	397	278.69
38	22.20	78	49.22	118	77.30	158	105.87	198	134.70	238	163.65	278	192.64	318	221.62	358	250.55	398	279.41
39	22.86	79	49.92	119	78.01	159	106.59	199	135.42	239	164.37	279	193.36	319	222.34	359	251.27	399	280.13
40	23.51	80	50.61	120	78.72	160	107.31	200	136.14	240	165.10	280	194.09	320	223.07	360	252.00	400	280.85

~~Table 15.~~Table 14. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Lead
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 0.01	41	0.94	81	2.00	121	3.10	161	4.21	201	5.33	241	6.46	281	7.59	321	8.72	361	9.85
2	~~NA~~ 0.03	42	0.97	82	2.03	122	3.12	162	4.24	202	5.36	242	6.49	282	7.62	322	8.75	362	9.88
3	~~NA~~ 0.05	43	0.99	83	2.05	123	3.15	163	4.27	203	5.39	243	6.52	283	7.65	323	8.78	363	9.90
4	~~NA~~ 0.07	44	1.02	84	2.08	124	3.18	164	4.29	204	5.42	244	6.55	284	7.68	324	8.81	364	9.93
5	~~NA~~ 0.09	45	1.04	85	2.11	125	3.21	165	4.32	205	5.45	245	6.57	285	7.70	325	8.83	365	9.96
6	~~NA~~ 0.11	46	1.07	86	2.13	126	3.23	166	4.35	206	5.47	246	6.60	286	7.73	326	8.86	366	9.99
7	~~NA~~ 0.13	47	1.10	87	2.16	127	3.26	167	4.38	207	5.50	247	6.63	287	7.76	327	8.89	367	10.02
8	~~NA~~ 0.15	48	1.12	88	2.19	128	3.29	168	4.41	208	5.53	248	6.66	288	7.79	328	8.92	368	10.05
9	~~NA~~ 0.17	49	1.15	89	2.22	129	3.32	169	4.43	209	5.56	249	6.69	289	7.82	329	8.95	369	10.07
10	~~NA~~ 0.19	50	1.17	90	2.24	130	3.34	170	4.46	210	5.59	250	6.72	290	7.85	330	8.97	370	10.10
11	~~NA~~ 0.21	51	1.20	91	2.27	131	3.37	171	4.49	211	5.62	251	6.74	291	7.87	331	9.00	371	10.13
12	~~NA~~ 0.24	52	1.23	92	2.30	132	3.40	172	4.52	212	5.64	252	6.77	292	7.90	332	9.03	372	10.16
13	~~NA~~ 0.26	53	1.25	93	2.33	133	3.43	173	4.55	213	5.67	253	6.80	293	7.93	333	9.06	373	10.19
14	~~NA~~ 0.28	54	1.28	94	2.35	134	3.46	174	4.57	214	5.70	254	6.83	294	7.96	334	9.09	374	10.21
15	~~NA~~ 0.30	55	1.31	95	2.38	135	3.48	175	4.60	215	5.73	255	6.86	295	7.99	335	9.12	375	10.24
16	~~NA~~ 0.33	56	1.33	96	2.41	136	3.51	176	4.63	216	5.76	256	6.89	296	8.02	336	9.14	376	10.27
17	~~NA~~ 0.35	57	1.36	97	2.43	137	3.54	177	4.66	217	5.78	257	6.91	297	8.04	337	9.17	377	10.30
18	~~NA~~ 0.37	58	1.38	98	2.46	138	3.57	178	4.69	218	5.81	258	6.94	298	8.07	338	9.20	378	10.33
19	~~NA~~ 0.40	59	1.41	99	2.49	139	3.60	179	4.71	219	5.84	259	6.97	299	8.10	339	9.23	379	10.35
20	~~NA~~ 0.42	60	1.44	100	2.52	140	3.62	180	4.74	220	5.87	260	7.00	300	8.13	340	9.26	380	10.38
21	~~NA~~ 0.44	61	1.46	101	2.54	141	3.65	181	4.77	221	5.90	261	7.03	301	8.16	341	9.28	381	10.41
22	~~NA~~ 0.47	62	1.49	102	2.57	142	3.68	182	4.80	222	5.93	262	7.05	302	8.18	342	9.31	382	10.44

~~Table 15.~~Table 14. Chronic Water Quality Standards for ~~dissolved~~ Dissolved Lead
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
23	~~NA~~ 0.49	63	1.52	103	2.60	143	3.71	183	4.83	223	5.95	263	7.08	303	8.21	343	9.34	383	10.47
24	~~NA~~ 0.52	64	1.54	104	2.63	144	3.73	184	4.85	224	5.98	264	7.11	304	8.24	344	9.37	384	10.49
25	0.54	65	1.57	105	2.65	145	3.76	185	4.88	225	6.01	265	7.14	305	8.27	345	9.40	385	10.52
26	0.57	66	1.60	106	2.68	146	3.79	186	4.91	226	6.04	266	7.17	306	8.30	346	9.43	386	10.55
27	0.59	67	1.62	107	2.71	147	3.82	187	4.94	227	6.07	267	7.20	307	8.33	347	9.45	387	10.58
28	0.61	68	1.65	108	2.74	148	3.85	188	4.97	228	6.09	268	7.22	308	8.35	348	9.48	388	10.61
29	0.64	69	1.68	109	2.76	149	3.87	189	5.00	229	6.12	269	7.25	309	8.38	349	9.51	389	10.64
30	0.66	70	1.70	110	2.79	150	3.90	190	5.02	230	6.15	270	7.28	310	8.41	350	9.54	390	10.66
31	0.69	71	1.73	111	2.82	151	3.93	191	5.05	231	6.18	271	7.31	311	8.44	351	9.57	391	10.69
32	0.71	72	1.76	112	2.85	152	3.96	192	5.08	232	6.21	272	7.34	312	8.47	352	9.59	392	10.72
33	0.74	73	1.78	113	2.87	153	3.99	193	5.11	233	6.24	273	7.37	313	8.50	353	9.62	393	10.75
34	0.76	74	1.81	114	2.90	154	4.01	194	5.14	234	6.26	274	7.39	314	8.52	354	9.65	394	10.78
35	0.79	75	1.84	115	2.93	155	4.04	195	5.16	235	6.29	275	7.42	315	8.55	355	9.68	395	10.80
36	0.81	76	1.86	116	2.96	156	4.07	196	5.19	236	6.32	276	7.45	316	8.58	356	9.71	396	10.83
37	0.84	77	1.89	117	2.98	157	4.10	197	5.22	237	6.35	277	7.48	317	8.61	357	9.74	397	10.86
38	0.87	78	1.92	118	3.01	158	4.13	198	5.25	238	6.38	278	7.51	318	8.64	358	9.76	398	10.89
39	0.89	79	1.95	119	3.04	159	4.15	199	5.28	239	6.41	279	7.54	319	8.66	359	9.79	399	10.92
40	0.92	80	1.97	120	3.07	160	4.18	200	5.31	240	6.43	280	7.56	320	8.69	360	9.82	400	10.94

~~Table 13.~~Table 15. Acute Water Quality Standards for ~~dissolved~~ Dissolved Lead
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 0.72	41	51.00	81	108.27	121	167.63	161	227.98	201	288.85	241	349.96	281	411.15	321	472.30	361	533.35
2	~~NA~~ 1.61	42	52.39	82	109.74	122	169.13	162	229.50	202	290.37	242	351.49	282	412.68	322	473.83	362	534.87
3	~~NA~~ 2.58	43	53.78	83	111.21	123	170.63	163	231.01	203	291.90	243	353.02	283	414.21	323	475.36	363	536.40
4	~~NA~~ 3.61	44	55.18	84	112.67	124	172.13	164	232.53	204	293.42	244	354.54	284	415.73	324	476.89	364	537.92
5	~~NA~~ 4.67	45	56.57	85	114.14	125	173.63	165	234.05	205	294.95	245	356.07	285	417.26	325	478.41	365	539.45
6	~~NA~~ 5.76	46	57.97	86	115.61	126	175.13	166	235.57	206	296.48	246	357.60	286	418.79	326	479.94	366	540.97
7	~~NA~~ 6.88	47	59.38	87	117.08	127	176.63	167	237.08	207	298.00	247	359.13	287	420.32	327	481.47	367	542.49
8	~~NA~~ 8.02	48	60.78	88	118.55	128	178.13	168	238.60	208	299.53	248	360.66	288	421.85	328	483.00	368	544.02
9	~~NA~~ 9.18	49	62.19	89	120.03	129	179.64	169	240.12	209	301.05	249	362.19	289	423.38	329	484.52	369	545.54
10	~~NA~~ 10.35	50	63.60	90	121.50	130	181.14	170	241.64	210	302.58	250	363.72	290	424.91	330	486.05	370	547.06
11	~~NA~~ 11.54	51	65.01	91	122.98	131	182.65	171	243.16	211	304.11	251	365.25	291	426.44	331	487.58	371	548.59
12	~~NA~~ 12.75	52	66.43	92	124.45	132	184.15	172	244.68	212	305.64	252	366.78	292	427.97	332	489.10	372	550.11
13	~~NA~~ 13.97	53	67.85	93	125.93	133	185.66	173	246.20	213	307.16	253	368.31	293	429.50	333	490.63	373	551.63
14	~~NA~~ 15.20	54	69.26	94	127.41	134	187.16	174	247.72	214	308.69	254	369.84	294	431.03	334	492.16	374	553.16
15	~~NA~~ 16.44	55	70.69	95	128.89	135	188.67	175	249.24	215	310.22	255	371.37	295	432.56	335	493.68	375	554.68
16	~~NA~~ 17.69	56	72.11	96	130.37	136	190.17	176	250.76	216	311.74	256	372.90	296	434.09	336	495.21	376	556.20
17	~~NA~~ 18.95	57	73.54	97	131.85	137	191.68	177	252.28	217	313.27	257	374.43	297	435.62	337	496.74	377	557.72
18	~~NA~~ 20.21	58	74.96	98	133.33	138	193.19	178	253.80	218	314.80	258	375.96	298	437.15	338	498.26	378	559.25
19	~~NA~~ 21.49	59	76.39	99	134.81	139	194.70	179	255.32	219	316.33	259	377.49	299	438.68	339	499.79	379	560.77
20	~~NA~~ 22.77	60	77.83	100	136.30	140	196.21	180	256.85	220	317.85	260	379.02	300	440.20	340	501.32	380	562.29
21	~~NA~~ 24.07	61	79.26	101	137.78	141	197.72	181	258.37	221	319.38	261	380.55	301	441.73	341	502.84	381	563.81

~~Table 13.~~Table 15. Acute Water Quality Standards for ~~dissolved~~ Dissolved Lead
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
22	~~NA~~ 25.36	62	80.70	102	139.27	142	199.23	182	259.89	222	320.91	262	382.08	302	443.26	342	504.37	382	565.34
23	~~NA~~ 26.67	63	82.13	103	140.75	143	200.74	183	261.41	223	322.44	263	383.61	303	444.79	343	505.90	383	566.86
24	~~NA~~ 27.98	64	83.57	104	142.24	144	202.25	184	262.93	224	323.97	264	385.14	304	446.32	344	507.42	384	568.38
25	29.30	65	85.01	105	143.73	145	203.76	185	264.46	225	325.49	265	386.67	305	447.85	345	508.95	385	569.90
26	30.62	66	86.46	106	145.21	146	205.27	186	265.98	226	327.02	266	388.20	306	449.38	346	510.47	386	571.42
27	31.95	67	87.90	107	146.70	147	206.78	187	267.50	227	328.55	267	389.73	307	450.91	347	512.00	387	572.94
28	33.28	68	89.35	108	148.19	148	208.29	188	269.03	228	330.08	268	391.26	308	452.44	348	513.53	388	574.47
29	34.62	69	90.79	109	149.68	149	209.80	189	270.55	229	331.61	269	392.79	309	453.96	349	515.05	389	575.99
30	35.96	70	92.24	110	151.18	150	211.32	190	272.07	230	333.14	270	394.32	310	455.49	350	516.58	390	577.51
31	37.31	71	93.69	111	152.67	151	212.83	191	273.60	231	334.67	271	395.85	311	457.02	351	518.10	391	579.03
32	38.66	72	95.14	112	154.16	152	214.34	192	275.12	232	336.19	272	397.38	312	458.55	352	519.63	392	580.55
33	40.02	73	96.60	113	155.65	153	215.86	193	276.65	233	337.72	273	398.91	313	460.08	353	521.15	393	582.07
34	41.38	74	98.05	114	157.15	154	217.37	194	278.17	234	339.25	274	400.44	314	461.61	354	522.68	394	583.59
35	42.74	75	99.51	115	158.64	155	218.89	195	279.69	235	340.78	275	401.97	315	463.13	355	524.20	395	585.11
36	44.11	76	100.97	116	160.14	156	220.40	196	281.22	236	342.31	276	403.50	316	464.66	356	525.73	396	586.63
37	45.48	77	102.43	117	161.64	157	221.92	197	282.74	237	343.84	277	405.03	317	466.19	357	527.25	397	588.15
38	46.86	78	103.89	118	163.13	158	223.43	198	284.27	238	345.37	278	406.56	318	467.72	358	528.78	398	589.67
39	48.24	79	105.35	119	164.63	159	224.95	199	285.79	239	346.90	279	408.09	319	469.25	359	530.30	399	591.19
40	49.62	80	106.81	120	166.13	160	226.46	200	287.32	240	348.43	280	409.62	320	470.77	360	531.83	400	592.71

Table 16. Acute Water Quality Standards for ~~dissolved~~ Dissolved Nickel
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 10	41	220	81	392	121	550	161	701	201	845	241	985	281	1122	321	1256	361	1387
2	~~NA~~ 17	42	225	82	396	122	554	162	704	202	849	242	989	282	1126	322	1259	362	1390
3	~~NA~~ 24	43	229	83	400	123	558	163	708	203	852	243	992	283	1129	323	1263	363	1394
4	~~NA~~ 31	44	234	84	404	124	562	164	712	204	856	244	996	284	1132	324	1266	364	1397
5	~~NA~~ 37	45	238	85	408	125	566	165	715	205	859	245	999	285	1136	325	1269	365	1400
6	~~NA~~ 43	46	243	86	412	126	569	166	719	206	863	246	1003	286	1139	326	1272	366	1403
7	~~NA~~ 49	47	247	87	416	127	573	167	723	207	867	247	1006	287	1142	327	1276	367	1407
8	~~NA~~ 55	48	252	88	420	128	577	168	726	208	870	248	1010	288	1146	328	1279	368	1410
9	~~NA~~ 61	49	256	89	424	129	581	169	730	209	874	249	1013	289	1149	329	1282	369	1413
10	~~NA~~ 67	50	260	90	428	130	585	170	734	210	877	250	1017	290	1153	330	1286	370	1416
11	~~NA~~ 72	51	265	91	432	131	588	171	737	211	881	251	1020	291	1156	331	1289	371	1420
12	~~NA~~ 78	52	269	92	436	132	592	172	741	212	884	252	1023	292	1159	332	1292	372	1423
13	~~NA~~ 83	53	274	93	440	133	596	173	744	213	888	253	1027	293	1163	333	1296	373	1426
14	~~NA~~ 89	54	278	94	444	134	600	174	748	214	891	254	1030	294	1166	334	1299	374	1429
15	~~NA~~ 94	55	282	95	448	135	604	175	752	215	895	255	1034	295	1169	335	1302	375	1433
16	~~NA~~ 99	56	287	96	452	136	607	176	755	216	898	256	1037	296	1173	336	1305	376	1436
17	~~NA~~ 105	57	291	97	456	137	611	177	759	217	902	257	1041	297	1176	337	1309	377	1439
18	~~NA~~ 110	58	295	98	460	138	615	178	763	218	905	258	1044	298	1179	338	1312	378	1442
19	~~NA~~ 115	59	300	99	464	139	619	179	766	219	909	259	1047	299	1183	339	1315	379	1445
20	~~NA~~ 120	60	304	100	468	140	622	180	770	220	912	260	1051	300	1186	340	1319	380	1449
21	~~NA~~ 125	61	308	101	472	141	626	181	774	221	916	261	1054	301	1189	341	1322	381	1452
22	~~NA~~ 130	62	312	102	476	142	630	182	777	222	919	262	1058	302	1193	342	1325	382	1455
23	~~NA~~ 135	63	317	103	480	143	634	183	781	223	923	263	1061	303	1196	343	1328	383	1458
24	~~NA~~ 140	64	321	104	484	144	637	184	784	224	926	264	1064	304	1199	344	1332	384	1462
25	145	65	325	105	488	145	641	185	788	225	930	265	1068	305	1203	345	1335	385	1465
26	150	66	329	106	492	146	645	186	792	226	933	266	1071	306	1206	346	1338	386	1468
27	155	67	334	107	496	147	649	187	795	227	937	267	1075	307	1209	347	1341	387	1471
28	159	68	338	108	500	148	652	188	799	228	940	268	1078	308	1213	348	1345	388	1474
29	164	69	342	109	504	149	656	189	802	229	944	269	1082	309	1216	349	1348	389	1478
30	169	70	346	110	508	150	660	190	806	230	947	270	1085	310	1219	350	1351	390	1481
31	174	71	350	111	511	151	664	191	810	231	951	271	1088	311	1223	351	1355	391	1484
32	179	72	355	112	515	152	667	192	813	232	954	272	1092	312	1226	352	1358	392	1487
33	183	73	359	113	519	153	671	193	817	233	958	273	1095	313	1229	353	1361	393	1490
34	188	74	363	114	523	154	675	194	820	234	961	274	1099	314	1233	354	1364	394	1494
35	193	75	367	115	527	155	678	195	824	235	965	275	1102	315	1236	355	1368	395	1497
36	197	76	371	116	531	156	682	196	827	236	968	276	1105	316	1239	356	1371	396	1500
37	202	77	375	117	535	157	686	197	831	237	972	277	1109	317	1243	357	1374	397	1503
38	207	78	379	118	539	158	689	198	835	238	975	278	1112	318	1246	358	1377	398	1506
39	211	79	384	119	542	159	693	199	838	239	979	279	1115	319	1249	359	1381	399	1510
40	216	80	388	120	546	160	697	200	842	240	982	280	1119	320	1253	360	1384	400	1513

Table 17. Chronic Water Quality Standards for~~dissolved~~ Dissolved Nickel
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
1	~~NA~~ 1.06	41	24.46	81	43.51	121	61.11	161	77.81	201	93.88	241	109.46	281	124.64	321	139.50	361	154.07
2	~~NA~~ 1.90	42	24.96	82	43.97	122	61.53	162	78.22	202	94.27	242	109.84	282	125.02	322	139.86	362	154.43
3	~~NA~~ 2.68	43	25.47	83	44.42	123	61.96	163	78.63	203	94.67	243	110.23	283	125.39	323	140.23	363	154.79
4	~~NA~~ 3.42	44	25.97	84	44.87	124	62.39	164	79.03	204	95.06	244	110.61	284	125.77	324	140.60	364	155.15
5	~~NA~~ 4.12	45	26.47	85	45.33	125	62.81	165	79.44	205	95.46	245	110.99	285	126.14	325	140.96	365	155.51
6	~~NA~~ 4.81	46	26.96	86	45.78	126	63.24	166	79.85	206	95.85	246	111.38	286	126.52	326	141.33	366	155.87
7	~~NA~~ 5.48	47	27.46	87	46.23	127	63.66	167	80.26	207	96.24	247	111.76	287	126.89	327	141.70	367	156.23
8	~~NA~~ 6.14	48	27.95	88	46.68	128	64.09	168	80.66	208	96.64	248	112.14	288	127.26	328	142.07	368	156.59
9	~~NA~~ 6.78	49	28.44	89	47.12	129	64.51	169	81.07	209	97.03	249	112.52	289	127.64	329	142.43	369	156.95
10	~~NA~~ 7.41	50	28.93	90	47.57	130	64.93	170	81.47	210	97.42	250	112.91	290	128.01	330	142.80	370	157.31
11	~~NA~~ 8.04	51	29.42	91	48.02	131	65.35	171	81.88	211	97.81	251	113.29	291	128.38	331	143.16	371	157.67
12	~~NA~~ 8.65	52	29.91	92	48.46	132	65.78	172	82.28	212	98.21	252	113.67	292	128.76	332	143.53	372	158.03
13	~~NA~~ 9.26	53	30.39	93	48.91	133	66.20	173	82.69	213	98.60	253	114.05	293	129.13	333	143.90	373	158.39
14	~~NA~~ 9.86	54	30.88	94	49.35	134	66.62	174	83.09	214	98.99	254	114.43	294	129.50	334	144.26	374	158.75
15	~~NA~~ 10.45	55	31.36	95	49.80	135	67.04	175	83.50	215	99.38	255	114.81	295	129.88	335	144.63	375	159.11
16	~~NA~~ 11.03	56	31.84	96	50.24	136	67.46	176	83.90	216	99.77	256	115.19	296	130.25	336	144.99	376	159.47
17	~~NA~~ 11.61	57	32.32	97	50.68	137	67.88	177	84.30	217	100.16	257	115.57	297	130.62	337	145.36	377	159.82
18	~~NA~~ 12.19	58	32.80	98	51.13	138	68.30	178	84.71	218	100.55	258	115.95	298	130.99	338	145.72	378	160.18
19	~~NA~~ 12.76	59	33.28	99	51.57	139	68.71	179	85.11	219	100.94	259	116.33	299	131.36	339	146.09	379	160.54
20	~~NA~~ 13.33	60	33.76	100	52.01	140	69.13	180	85.51	220	101.33	260	116.71	300	131.74	340	146.45	380	160.90
21	~~NA~~ 13.89	61	34.23	101	52.45	141	69.55	181	85.91	221	101.72	261	117.09	301	132.11	341	146.81	381	161.26
22	~~NA~~ 14.45	62	34.71	102	52.89	142	69.97	182	86.31	222	102.11	262	117.47	302	132.48	342	147.18	382	161.62
23	~~NA~~ 15.00	63	35.18	103	53.32	143	70.38	183	86.71	223	102.50	263	117.85	303	132.85	343	147.54	383	161.97
24	~~NA~~ 15.55	64	35.65	104	53.76	144	70.80	184	87.12	224	102.89	264	118.23	304	133.22	344	147.91	384	162.33
25	16.10	65	36.12	105	54.20	145	71.22	185	87.52	225	103.28	265	118.61	305	133.59	345	148.27	385	162.69
26	16.64	66	36.59	106	54.63	146	71.63	186	87.92	226	103.67	266	118.99	306	133.96	346	148.63	386	163.05
27	17.18	67	37.06	107	55.07	147	72.05	187	88.32	227	104.05	267	119.37	307	134.33	347	149.00	387	163.40
28	17.72	68	37.53	108	55.51	148	72.46	188	88.71	228	104.44	268	119.75	308	134.70	348	149.36	388	163.76
29	18.25	69	37.99	109	55.94	149	72.87	189	89.11	229	104.83	269	120.12	309	135.07	349	149.72	389	164.12
30	18.78	70	38.46	110	56.37	150	73.29	190	89.51	230	105.22	270	120.50	310	135.44	350	150.09	390	164.47
31	19.31	71	38.92	111	56.81	151	73.70	191	89.91	231	105.60	271	120.88	311	135.81	351	150.45	391	164.83
32	19.83	72	39.39	112	57.24	152	74.11	192	90.31	232	105.99	272	121.26	312	136.18	352	150.81	392	165.19
33	20.36	73	39.85	113	57.67	153	74.53	193	90.71	233	106.38	273	121.63	313	136.55	353	151.17	393	165.54
34	20.88	74	40.31	114	58.10	154	74.94	194	91.10	234	106.76	274	122.01	314	136.92	354	151.54	394	165.90
35	21.40	75	40.77	115	58.53	155	75.35	195	91.50	235	107.15	275	122.39	315	137.29	355	151.90	395	166.26
36	21.91	76	41.23	116	58.96	156	75.76	196	91.90	236	107.53	276	122.76	316	137.66	356	152.26	396	166.61
37	22.43	77	41.69	117	59.39	157	76.17	197	92.29	237	107.92	277	123.14	317	138.02	357	152.62	397	166.97
38	22.94	78	42.15	118	59.82	158	76.58	198	92.69	238	108.30	278	123.52	318	138.39	358	152.98	398	167.32
39	23.45	79	42.60	119	60.25	159	76.99	199	93.09	239	108.69	279	123.89	319	138.76	359	153.34	399	167.68
40	23.96	80	43.06	120	60.68	160	77.40	200	93.48	240	109.07	280	124.27	320	139.13	360	153.71	400	168.04

~~Table 18. Water Quality Standards for dissolved Silver~~
~~Aquatic and Wildlife coldwater, warmwater, cdw and ephemeral~~

~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~	~~Hard. mg/L~~	~~Std. ug/L~~
~~1~~	~~NA~~	~~41~~	~~0.74~~	~~81~~	~~2.40~~	~~121~~	~~4.79~~	~~161~~	~~7.83~~	~~201~~	~~11.46~~	~~241~~	~~15.66~~	~~281~~	~~20.40~~	~~321~~	~~25.65~~	~~361~~	~~31.39~~
~~2~~	~~NA~~	~~42~~	~~0.78~~	~~82~~	~~2.45~~	~~122~~	~~4.86~~	~~162~~	~~7.91~~	~~202~~	~~11.56~~	~~242~~	~~15.78~~	~~282~~	~~20.52~~	~~322~~	~~25.78~~	~~362~~	~~31.54~~
~~3~~	~~NA~~	~~43~~	~~0.81~~	~~83~~	~~2.50~~	~~123~~	~~4.93~~	~~163~~	~~7.99~~	~~203~~	~~11.66~~	~~243~~	~~15.89~~	~~283~~	~~20.65~~	~~323~~	~~25.92~~	~~363~~	~~31.69~~
~~4~~	~~NA~~	~~44~~	~~0.84~~	~~84~~	~~2.56~~	~~124~~	~~4.99~~	~~164~~	~~8.08~~	~~204~~	~~11.76~~	~~244~~	~~16.00~~	~~284~~	~~20.77~~	~~324~~	~~26.06~~	~~364~~	~~31.84~~
~~5~~	~~NA~~	~~45~~	~~0.87~~	~~85~~	~~2.61~~	~~125~~	~~5.06~~	~~165~~	~~8.16~~	~~205~~	~~11.86~~	~~245~~	~~16.11~~	~~285~~	~~20.90~~	~~325~~	~~26.20~~	~~365~~	~~31.99~~
~~6~~	~~NA~~	~~46~~	~~0.91~~	~~86~~	~~2.66~~	~~126~~	~~5.13~~	~~166~~	~~8.25~~	~~206~~	~~11.96~~	~~246~~	~~16.23~~	~~286~~	~~21.03~~	~~326~~	~~26.34~~	~~366~~	~~32.14~~
~~7~~	~~NA~~	~~47~~	~~0.94~~	~~87~~	~~2.72~~	~~127~~	~~5.20~~	~~167~~	~~8.33~~	~~207~~	~~12.06~~	~~247~~	~~16.34~~	~~287~~	~~21.15~~	~~327~~	~~26.48~~	~~367~~	~~32.29~~
~~8~~	~~NA~~	~~48~~	~~0.98~~	~~88~~	~~2.77~~	~~128~~	~~5.27~~	~~168~~	~~8.42~~	~~208~~	~~12.16~~	~~248~~	~~16.45~~	~~288~~	~~21.28~~	~~328~~	~~26.61~~	~~368~~	~~32.44~~
~~9~~	~~NA~~	~~49~~	~~1.01~~	~~89~~	~~2.82~~	~~129~~	~~5.35~~	~~169~~	~~8.51~~	~~209~~	~~12.26~~	~~249~~	~~16.57~~	~~289~~	~~21.41~~	~~329~~	~~26.75~~	~~369~~	~~32.59~~
~~10~~	~~NA~~	~~50~~	~~1.05~~	~~90~~	~~2.88~~	~~130~~	~~5.42~~	~~170~~	~~8.59~~	~~210~~	~~12.36~~	~~250~~	~~16.68~~	~~290~~	~~21.53~~	~~330~~	~~26.89~~	~~370~~	~~32.74~~
~~11~~	~~NA~~	~~51~~	~~1.08~~	~~91~~	~~2.93~~	~~131~~	~~5.49~~	~~171~~	~~8.68~~	~~211~~	~~12.46~~	~~251~~	~~16.80~~	~~291~~	~~21.66~~	~~331~~	~~27.03~~	~~371~~	~~32.90~~
~~12~~	~~NA~~	~~52~~	~~1.12~~	~~92~~	~~2.99~~	~~132~~	~~5.56~~	~~172~~	~~8.77~~	~~212~~	~~12.56~~	~~252~~	~~16.91~~	~~292~~	~~21.79~~	~~332~~	~~27.18~~	~~372~~	~~33.05~~
~~13~~	~~NA~~	~~53~~	~~1.16~~	~~93~~	~~3.05~~	~~133~~	~~5.63~~	~~173~~	~~8.86~~	~~213~~	~~12.67~~	~~253~~	~~17.03~~	~~293~~	~~21.92~~	~~333~~	~~27.32~~	~~373~~	~~33.20~~
~~14~~	~~NA~~	~~54~~	~~1.20~~	~~94~~	~~3.10~~	~~134~~	~~5.71~~	~~174~~	~~8.94~~	~~214~~	~~12.77~~	~~254~~	~~17.14~~	~~294~~	~~22.05~~	~~334~~	~~27.46~~	~~374~~	~~33.35~~
~~15~~	~~NA~~	~~55~~	~~1.23~~	~~95~~	~~3.16~~	~~135~~	~~5.78~~	~~175~~	~~9.03~~	~~215~~	~~12.87~~	~~255~~	~~17.26~~	~~295~~	~~22.18~~	~~335~~	~~27.60~~	~~375~~	~~33.51~~
~~16~~	~~NA~~	~~56~~	~~1.27~~	~~96~~	~~3.22~~	~~136~~	~~5.85~~	~~176~~	~~9.12~~	~~216~~	~~12.97~~	~~256~~	~~17.38~~	~~296~~	~~22.31~~	~~336~~	~~27.74~~	~~376~~	~~33.66~~
~~17~~	~~NA~~	~~57~~	~~1.31~~	~~97~~	~~3.27~~	~~137~~	~~5.93~~	~~177~~	~~9.21~~	~~217~~	~~13.08~~	~~257~~	~~17.49~~	~~297~~	~~22.44~~	~~337~~	~~27.88~~	~~377~~	~~33.82~~
~~18~~	~~NA~~	~~58~~	~~1.35~~	~~98~~	~~3.33~~	~~138~~	~~6.00~~	~~178~~	~~9.30~~	~~218~~	~~13.18~~	~~258~~	~~17.61~~	~~298~~	~~22.57~~	~~338~~	~~28.03~~	~~378~~	~~33.97~~
~~19~~	~~NA~~	~~59~~	~~1.39~~	~~99~~	~~3.39~~	~~139~~	~~6.08~~	~~179~~	~~9.39~~	~~219~~	~~13.29~~	~~259~~	~~17.73~~	~~299~~	~~22.70~~	~~339~~	~~28.17~~	~~379~~	~~34.13~~
~~20~~	~~NA~~	~~60~~	~~1.43~~	~~100~~	~~3.45~~	~~140~~	~~6.15~~	~~180~~	~~9.48~~	~~220~~	~~13.39~~	~~260~~	~~17.85~~	~~300~~	~~22.83~~	~~340~~	~~28.31~~	~~380~~	~~34.28~~
~~21~~	~~NA~~	~~61~~	~~1.47~~	~~101~~	~~3.51~~	~~141~~	~~6.23~~	~~181~~	~~9.57~~	~~221~~	~~13.50~~	~~261~~	~~17.97~~	~~301~~	~~22.96~~	~~341~~	~~28.45~~	~~381~~	~~34.44~~
~~22~~	~~NA~~	~~62~~	~~1.52~~	~~102~~	~~3.57~~	~~142~~	~~6.31~~	~~182~~	~~9.66~~	~~222~~	~~13.60~~	~~262~~	~~18.08~~	~~302~~	~~23.09~~	~~342~~	~~28.60~~	~~382~~	~~34.59~~
~~23~~	~~NA~~	~~63~~	~~1.56~~	~~103~~	~~3.63~~	~~143~~	~~6.38~~	~~183~~	~~9.76~~	~~223~~	~~13.71~~	~~263~~	~~18.20~~	~~303~~	~~23.22~~	~~343~~	~~28.74~~	~~383~~	~~34.75~~
~~24~~	~~NA~~	~~64~~	~~1.60~~	~~104~~	~~3.69~~	~~144~~	~~6.46~~	~~184~~	~~9.85~~	~~224~~	~~13.81~~	~~264~~	~~18.32~~	~~304~~	~~23.35~~	~~344~~	~~28.89~~	~~384~~	~~34.90~~
~~25~~	~~0.32~~	~~65~~	~~1.64~~	~~105~~	~~3.75~~	~~145~~	~~6.54~~	~~185~~	~~9.94~~	~~225~~	~~13.92~~	~~265~~	~~18.44~~	~~305~~	~~23.49~~	~~345~~	~~29.03~~	~~385~~	~~35.06~~
~~26~~	~~0.34~~	~~66~~	~~1.69~~	~~106~~	~~3.81~~	~~146~~	~~6.61~~	~~186~~	~~10.03~~	~~226~~	~~14.02~~	~~266~~	~~18.56~~	~~306~~	~~23.62~~	~~346~~	~~29.18~~	~~386~~	~~35.22~~
~~27~~	~~0.36~~	~~67~~	~~1.73~~	~~107~~	~~3.88~~	~~147~~	~~6.69~~	~~187~~	~~10.12~~	~~227~~	~~14.13~~	~~267~~	~~18.68~~	~~307~~	~~23.75~~	~~347~~	~~29.32~~	~~387~~	~~35.37~~
~~28~~	~~0.39~~	~~68~~	~~1.78~~	~~108~~	~~3.94~~	~~148~~	~~6.77~~	~~188~~	~~10.22~~	~~228~~	~~14.24~~	~~268~~	~~18.80~~	~~308~~	~~23.89~~	~~348~~	~~29.47~~	~~388~~	~~35.53~~
~~29~~	~~0.41~~	~~69~~	~~1.82~~	~~109~~	~~4.00~~	~~149~~	~~6.85~~	~~189~~	~~10.31~~	~~229~~	~~14.35~~	~~269~~	~~18.92~~	~~309~~	~~24.02~~	~~349~~	~~29.61~~	~~389~~	~~35.69~~
~~30~~	~~0.43~~	~~70~~	~~1.87~~	~~110~~	~~4.06~~	~~150~~	~~6.93~~	~~190~~	~~10.41~~	~~230~~	~~14.45~~	~~270~~	~~19.04~~	~~310~~	~~24.15~~	~~350~~	~~29.76~~	~~390~~	~~35.85~~
~~31~~	~~0.46~~	~~71~~	~~1.91~~	~~111~~	~~4.13~~	~~151~~	~~7.01~~	~~191~~	~~10.50~~	~~231~~	~~14.56~~	~~271~~	~~19.17~~	~~311~~	~~24.29~~	~~351~~	~~29.91~~	~~391~~	~~36.01~~
~~32~~	~~0.49~~	~~72~~	~~1.96~~	~~112~~	~~4.19~~	~~152~~	~~7.09~~	~~192~~	~~10.59~~	~~232~~	~~14.67~~	~~272~~	~~19.29~~	~~312~~	~~24.42~~	~~352~~	~~30.05~~	~~392~~	~~36.16~~
~~33~~	~~0.51~~	~~73~~	~~2.01~~	~~113~~	~~4.26~~	~~153~~	~~7.17~~	~~193~~	~~10.69~~	~~233~~	~~14.78~~	~~273~~	~~19.41~~	~~313~~	~~24.56~~	~~353~~	~~30.20~~	~~393~~	~~36.32~~
~~34~~	~~0.54~~	~~74~~	~~2.06~~	~~114~~	~~4.32~~	~~154~~	~~7.25~~	~~194~~	~~10.79~~	~~234~~	~~14.89~~	~~274~~	~~19.53~~	~~314~~	~~24.69~~	~~354~~	~~30.35~~	~~394~~	~~36.48~~
~~35~~	~~0.57~~	~~75~~	~~2.10~~	~~115~~	~~4.39~~	~~155~~	~~7.33~~	~~195~~	~~10.88~~	~~235~~	~~15.00~~	~~275~~	~~19.65~~	~~315~~	~~24.83~~	~~355~~	~~30.49~~	~~395~~	~~36.64~~
~~36~~	~~0.60~~	~~76~~	~~2.15~~	~~116~~	~~4.45~~	~~156~~	~~7.41~~	~~196~~	~~10.98~~	~~236~~	~~15.11~~	~~276~~	~~19.78~~	~~316~~	~~24.96~~	~~356~~	~~30.64~~	~~396~~	~~36.80~~
~~37~~	~~0.62~~	~~77~~	~~2.20~~	~~117~~	~~4.52~~	~~157~~	~~7.49~~	~~197~~	~~11.07~~	~~237~~	~~15.22~~	~~277~~	~~19.90~~	~~317~~	~~25.10~~	~~357~~	~~30.79~~	~~397~~	~~36.96~~
~~38~~	~~0.65~~	~~78~~	~~2.25~~	~~118~~	~~4.59~~	~~158~~	~~7.58~~	~~198~~	~~11.17~~	~~238~~	~~15.33~~	~~278~~	~~20.03~~	~~318~~	~~25.23~~	~~358~~	~~30.94~~	~~398~~	~~37.12~~
~~39~~	~~0.68~~	~~79~~	~~2.30~~	~~119~~	~~4.65~~	~~159~~	~~7.66~~	~~199~~	~~11.27~~	~~239~~	~~15.44~~	~~279~~	~~20.15~~	~~319~~	~~25.37~~	~~359~~	~~31.09~~	~~399~~	~~37.28~~
~~40~~	~~0.71~~	~~80~~	~~2.35~~	~~120~~	~~4.72~~	~~160~~	~~7.74~~	~~200~~	~~11.37~~	~~240~~	~~15.55~~	~~280~~	~~20.27~~	~~320~~	~~25.51~~	~~360~~	~~31.24~~	~~400~~	~~37.44~~

~~Table 12.~~Table 18. Acute Water Quality Standards for ~~dissolved~~ Dissolved Nickel
Aquatic and Wildlife ephemeral

Hard. mg/L	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**	**Hard. mg/L**	**Std. ~~ug/L~~ µg/L**
1	~~NA~~ 85	41	1956	81	3479	121	4886	161	6221	201	7506	241	8752	281	9966	321	11154	361	12319
2	~~NA~~ 152	42	1996	82	3516	122	4920	162	6254	202	7538	242	8783	282	9996	322	11183	362	12348
3	~~NA~~ 214	43	2036	83	3552	123	4954	163	6287	203	7569	243	8813	283	10026	323	11213	363	12377
4	~~NA~~ 273	44	2076	84	3588	124	4988	164	6319	204	7601	244	8844	284	10056	324	11242	364	12405
5	~~NA~~ 330	45	2116	85	3624	125	5022	165	6352	205	7632	245	8875	285	10086	325	11271	365	12434
6	~~NA~~ 385	46	2156	86	3660	126	5056	166	6385	206	7664	246	8905	286	10116	326	11301	366	12463
7	~~NA~~ 438	47	2195	87	3696	127	5090	167	6417	207	7695	247	8936	287	10146	327	11330	367	12492
8	~~NA~~ 491	48	2235	88	3732	128	5124	168	6450	208	7727	248	8967	288	10176	328	11359	368	12521
9	~~NA~~ 542	49	2274	89	3768	129	5158	169	6482	209	7758	249	8997	289	10206	329	11389	369	12549
10	~~NA~~ 593	50	2313	90	3804	130	5192	170	6514	210	7790	250	9028	290	10235	330	11418	370	12578
11	~~NA~~ 643	51	2352	91	3839	131	5226	171	6547	211	7821	251	9058	291	10265	331	11447	371	12607
12	~~NA~~ 692	52	2391	92	3875	132	5259	172	6579	212	7852	252	9089	292	10295	332	11476	372	12636
13	~~NA~~ 740	53	2430	93	3911	133	5293	173	6612	213	7884	253	9119	293	10325	333	11506	373	12664
14	~~NA~~ 788	54	2469	94	3946	134	5327	174	6644	214	7915	254	9150	294	10355	334	11535	374	12693
15	~~NA~~ 835	55	2508	95	3982	135	5360	175	6676	215	7946	255	9180	295	10385	335	11564	375	12722
16	~~NA~~ 882	56	2546	96	4017	136	5394	176	6708	216	7978	256	9211	296	10414	336	11593	376	12751
17	~~NA~~ 929	57	2585	97	4053	137	5427	177	6741	217	8009	257	9241	297	10444	337	11622	377	12779
18	~~NA~~ 975	58	2623	98	4088	138	5461	178	6773	218	8040	258	9272	298	10474	338	11652	378	12808
19	~~NA~~ 1020	59	2661	99	4123	139	5494	179	6805	219	8071	259	9302	299	10504	339	11681	379	12837

~~Table 12.~~Table 18. Acute Water Quality Standards for ~~dissolved~~ Dissolved Nickel
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L	Hard. mg/L	Std. ~~ug/L~~ µg/L
20	~~NA~~ 1066	60	2699	100	4158	140	5528	180	6837	220	8102	260	9332	300	10533	340	11710	380	12865
21	~~NA~~ 1110	61	2737	101	4193	141	5561	181	6869	221	8133	261	9363	301	10563	341	11739	381	12894
22	~~NA~~ 1155	62	2775	102	4229	142	5594	182	6901	222	8165	262	9393	302	10593	342	11768	382	12922
23	~~NA~~ 1199	63	2813	103	4264	143	5628	183	6934	223	8196	263	9423	303	10622	343	11797	383	12951
24	~~NA~~ 1243	64	2851	104	4299	144	5661	184	6966	224	8227	264	9454	304	10652	344	11826	384	12980
25	1287	65	2888	105	4334	145	5694	185	6998	225	8258	265	9484	305	10682	345	11855	385	13008
26	1330	66	2926	106	4368	146	5727	186	7030	226	8289	266	9514	306	10711	346	11884	386	13037
27	1374	67	2963	107	4403	147	5761	187	7062	227	8320	267	9544	307	10741	347	11913	387	13065
28	1416	68	3001	108	4438	148	5794	188	7093	228	8351	268	9575	308	10770	348	11943	388	13094
29	1459	69	3038	109	4473	149	5827	189	7125	229	8382	269	9605	309	10800	349	11972	389	13123
30	1502	70	3075	110	4508	150	5860	190	7157	230	8413	270	9635	310	10830	350	12001	390	13151
31	1544	71	3112	111	4542	151	5893	191	7189	231	8444	271	9665	311	10859	351	12030	391	13180
32	1586	72	3149	112	4577	152	5926	192	7221	232	8475	272	9695	312	10889	352	12059	392	13208
33	1628	73	3186	113	4611	153	5959	193	7253	233	8506	273	9726	313	10918	353	12088	393	13237
34	1669	74	3223	114	4646	154	5992	194	7285	234	8536	274	9756	314	10948	354	12116	394	13265
35	1711	75	3260	115	4680	155	6025	195	7316	235	8567	275	9786	315	10977	355	12145	395	13294
36	1752	76	3297	116	4715	156	6058	196	7348	236	8598	276	9816	316	11007	356	12174	396	13322
37	1793	77	3333	117	4749	157	6090	197	7380	237	8629	277	9846	317	11036	357	12203	397	13350
38	1834	78	3370	118	4783	158	6123	198	7411	238	8660	278	9876	318	11066	358	12232	398	13379
39	1875	79	3407	119	4818	159	6156	199	7443	239	8691	279	9906	319	11095	359	12261	399	13407
40	1915	80	3443	120	4852	160	6189	200	7475	240	8721	280	9936	320	11124	360	12290	400	13436

Table 19. Acute Water Quality Standards for Dissolved Silver
Aquatic and Wildlife coldwater, warmwater, edw, and ephemeral

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
1	0.001	41	0.69	81	2.24	121	4.46	161	7.30	201	10.69	241	14.60	281	19.02	321	23.91	361	29.26
2	0.004	42	0.72	82	2.29	122	4.53	162	7.38	202	10.78	242	14.71	282	19.14	322	24.04	362	29.40
3	0.01	43	0.75	83	2.33	123	4.59	163	7.45	203	10.87	243	14.81	283	19.25	323	24.17	363	29.54
4	0.01	44	0.78	84	2.38	124	4.66	164	7.53	204	10.96	244	14.92	284	19.37	324	24.30	364	29.68
5	0.02	45	0.81	85	2.43	125	4.72	165	7.61	205	11.06	245	15.02	285	19.49	325	24.43	365	29.82
6	0.03	46	0.85	86	2.48	126	4.79	166	7.69	206	11.15	246	15.13	286	19.61	326	24.56	366	29.96
7	0.03	47	0.88	87	2.53	127	4.85	167	7.77	207	11.24	247	15.24	287	19.72	327	24.69	367	30.11
8	0.04	48	0.91	88	2.58	128	4.92	168	7.85	208	11.34	248	15.34	288	19.84	328	24.82	368	30.25
9	0.05	49	0.94	89	2.63	129	4.98	169	7.93	209	11.43	249	15.45	289	19.96	329	24.95	369	30.39
10	0.06	50	0.98	90	2.68	130	5.05	170	8.01	210	11.52	250	15.56	290	20.08	330	25.08	370	30.53
11	0.07	51	1.01	91	2.74	131	5.12	171	8.09	211	11.62	251	15.66	291	20.20	331	25.21	371	30.67
12	0.08	52	1.04	92	2.79	132	5.19	172	8.18	212	11.71	252	15.77	292	20.32	332	25.34	372	30.81
13	0.10	53	1.08	93	2.84	133	5.25	173	8.26	213	11.81	253	15.88	293	20.44	333	25.47	373	30.96
14	0.11	54	1.11	94	2.89	134	5.32	174	8.34	214	11.91	254	15.99	294	20.56	334	25.60	374	31.10
15	0.12	55	1.15	95	2.95	135	5.39	175	8.42	215	12.00	255	16.09	295	20.68	335	25.73	375	31.24
16	0.14	56	1.19	96	3.00	136	5.46	176	8.51	216	12.10	256	16.20	296	20.80	336	25.87	376	31.39
17	0.15	57	1.22	97	3.05	137	5.53	177	8.59	217	12.19	257	16.31	297	20.92	337	26.00	377	31.53
18	0.17	58	1.26	98	3.11	138	5.60	178	8.67	218	12.29	258	16.42	298	21.04	338	26.13	378	31.67
19	0.18	59	1.30	99	3.16	139	5.67	179	8.76	219	12.39	259	16.53	299	21.16	339	26.26	379	31.82
20	0.20	60	1.34	100	3.22	140	5.74	180	8.84	220	12.48	260	16.64	300	21.28	340	26.40	380	31.96
21	0.22	61	1.37	101	3.27	141	5.81	181	8.93	221	12.58	261	16.75	301	21.41	341	26.53	381	32.11

Table 19. Acute Water Quality Standards for Dissolved Silver
Aquatic and Wildlife coldwater, warmwater, edw, and ephemeral

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
22	0.24	62	1.41	102	3.33	142	5.88	182	9.01	222	12.68	262	16.86	302	21.53	342	26.67	382	32.25
23	0.26	63	1.45	103	3.38	143	5.95	183	9.10	223	12.78	263	16.97	303	21.65	343	26.80	383	32.40
24	0.28	64	1.49	104	3.44	144	6.02	184	9.18	224	12.88	264	17.08	304	21.78	344	26.93	384	32.54
25	0.30	65	1.53	105	3.50	145	6.09	185	9.27	225	12.98	265	17.19	305	21.90	345	27.07	385	32.69
26	0.32	66	1.57	106	3.56	146	6.17	186	9.35	226	13.08	266	17.31	306	22.02	346	27.20	386	32.84
27	0.34	67	1.62	107	3.61	147	6.24	187	9.44	227	13.18	267	17.42	307	22.15	347	27.34	387	32.98
28	0.36	68	1.66	108	3.67	148	6.31	188	9.53	228	13.28	268	17.53	308	22.27	348	27.47	388	33.13
29	0.38	69	1.70	109	3.73	149	6.39	189	9.61	229	13.38	269	17.64	309	22.39	349	27.61	389	33.28
30	0.41	70	1.74	110	3.79	150	6.46	190	9.70	230	13.48	270	17.76	310	22.52	350	27.75	390	33.42
31	0.43	71	1.78	111	3.85	151	6.54	191	9.79	231	13.58	271	17.87	311	22.64	351	27.88	391	33.57
32	0.45	72	1.83	112	3.91	152	6.61	192	9.88	232	13.68	272	17.98	312	22.77	352	28.02	392	33.72
33	0.48	73	1.87	113	3.97	153	6.68	193	9.97	233	13.78	273	18.10	313	22.90	353	28.16	393	33.87
34	0.50	74	1.92	114	4.03	154	6.76	194	10.06	234	13.88	274	18.21	314	23.02	354	28.29	394	34.02
35	0.53	75	1.96	115	4.09	155	6.84	195	10.15	235	13.98	275	18.33	315	23.15	355	28.43	395	34.16
36	0.55	76	2.01	116	4.15	156	6.91	196	10.24	236	14.09	276	18.44	316	23.27	356	28.57	396	34.31
37	0.58	77	2.05	117	4.21	157	6.99	197	10.33	237	14.19	277	18.56	317	23.40	357	28.71	397	34.46
38	0.61	78	2.10	118	4.28	158	7.06	198	10.42	238	14.29	278	18.67	318	23.53	358	28.85	398	34.61
39	0.64	79	2.14	119	4.34	159	7.14	199	10.51	239	14.40	279	18.79	319	23.66	359	28.99	399	34.76
40	0.67	80	2.19	120	4.40	160	7.22	200	10.60	240	14.50	280	18.90	320	23.78	360	29.12	400	34.91

Table 20. Acute and Chronic Water Quality Standards for ~~dissolved~~ Dissolved Zinc
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
1	~~NA~~ 2.4	41	55.1	81	98.0	121	137.7	161	175.4	201	211.7	241	246.9	281	281.2	321	314.8	361	347.7
2	~~NA~~ 4.3	42	56.2	82	99.0	122	138.7	162	176.4	202	212.6	242	247.8	282	282.1	322	315.6	362	348.5
3	~~NA~~ 6.0	43	57.3	83	100.1	123	139.6	163	177.3	203	213.5	243	248.6	283	282.9	323	316.4	363	349.4
4	~~NA~~ 7.7	44	58.4	84	101.1	124	140.6	164	178.2	204	214.4	244	249.5	284	283.8	324	317.3	364	350.2
5	~~NA~~ 9.3	45	59.6	85	102.1	125	141.6	165	179.1	205	215.3	245	250.4	285	284.6	325	318.1	365	351.0
6	~~NA~~ 10.8	46	60.7	86	103.1	126	142.5	166	180.0	206	216.2	246	251.2	286	285.5	326	318.9	366	351.8
7	~~NA~~ 12.3	47	61.8	87	104.1	127	143.5	167	181.0	207	217.1	247	252.1	287	286.3	327	319.8	367	352.6
8	~~NA~~ 13.8	48	62.9	88	105.2	128	144.4	168	181.9	208	217.9	248	253.0	288	287.1	328	320.6	368	353.4
9	~~NA~~ 15.2	49	64.0	89	106.2	129	145.4	169	182.8	209	218.8	249	253.8	289	288.0	329	321.4	369	354.2
10	~~NA~~ 16.7	50	65.1	90	107.2	130	146.4	170	183.7	210	219.7	250	254.7	290	288.8	330	322.2	370	355.1
11	~~NA~~ 18.1	51	66.2	91	108.2	131	147.3	171	184.6	211	220.6	251	255.6	291	289.7	331	323.1	371	355.9
12	~~NA~~ 19.4	52	67.3	92	109.2	132	148.3	172	185.5	212	221.5	252	256.4	292	290.5	332	323.9	372	356.7
13	~~NA~~ 20.8	53	68.4	93	110.2	133	149.2	173	186.4	213	222.4	253	257.3	293	291.4	333	324.7	373	357.5
14	~~NA~~ 22.1	54	69.5	94	111.2	134	150.2	174	187.4	214	223.3	254	258.1	294	292.2	334	325.6	374	358.3
15	~~NA~~ 23.5	55	70.6	95	112.2	135	151.1	175	188.3	215	224.1	255	259.0	295	293.0	335	326.4	375	359.1

Table 20. Acute and Chronic Water Quality Standards for ~~dissolved~~ Dissolved Zinc
Aquatic and Wildlife coldwater, warmwater and edw

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
16	~~NA~~ 24.8	56	71.7	96	113.2	136	152.1	176	189.2	216	225.0	256	259.9	296	293.9	336	327.2	376	359.9
17	~~NA~~ 26.1	57	72.8	97	114.2	137	153.0	177	190.1	217	225.9	257	260.7	297	294.7	337	328.0	377	360.7
18	~~NA~~ 27.4	58	73.9	98	115.2	138	153.9	178	191.0	218	226.8	258	261.6	298	295.6	338	328.9	378	361.5
19	~~NA~~ 28.7	59	74.9	99	116.2	139	154.9	179	191.9	219	227.7	259	262.4	299	296.4	339	329.7	379	362.4
20	~~NA~~ 30.0	60	76.0	100	117.2	140	155.8	180	192.8	220	228.6	260	263.3	300	297.2	340	330.5	380	363.2
21	~~NA~~ 31.2	61	77.1	101	118.2	141	156.8	181	193.7	221	229.4	261	264.2	301	298.1	341	331.3	381	364.0
22	~~NA~~ 32.5	62	78.2	102	119.2	142	157.7	182	194.6	222	230.3	262	265.0	302	298.9	342	332.2	382	364.8
23	~~NA~~ 33.7	63	79.2	103	120.2	143	158.7	183	195.5	223	231.2	263	265.9	303	299.8	343	333.0	383	365.6
24	~~NA~~ 35.0	64	80.3	104	121.1	144	159.6	184	196.4	224	232.1	264	266.7	304	300.6	344	333.8	384	366.4
25	36.2	65	81.3	105	122.1	145	160.5	185	197.3	225	232.9	265	267.6	305	301.4	345	334.6	385	367.2
26	37.4	66	82.4	106	123.1	146	161.5	186	198.3	226	233.8	266	268.4	306	302.3	346	335.4	386	368.0
27	38.6	67	83.5	107	124.1	147	162.4	187	199.2	227	234.7	267	269.3	307	303.1	347	336.3	387	368.8
28	39.9	68	84.5	108	125.1	148	163.3	188	200.1	228	235.6	268	270.2	308	304.0	348	337.1	388	369.6
29	41.1	69	85.6	109	126.1	149	164.3	189	201.0	229	236.5	269	271.0	309	304.8	349	337.9	389	370.4
30	42.2	70	86.6	110	127.0	150	165.2	190	201.9	230	237.3	270	271.9	310	305.6	350	338.7	390	371.2
31	43.4	71	87.7	111	128.0	151	166.2	191	202.8	231	238.2	271	272.7	311	306.5	351	339.5	391	372.1
32	44.6	72	88.7	112	129.0	152	167.1	192	203.7	232	239.1	272	273.6	312	307.3	352	340.4	392	372.9
33	45.8	73	89.8	113	130.0	153	168.0	193	204.6	233	239.9	273	274.4	313	308.1	353	341.2	393	373.7
34	47.0	74	90.8	114	130.9	154	168.9	194	205.5	234	240.8	274	275.3	314	309.0	354	342.0	394	374.5
35	48.1	75	91.8	115	131.9	155	169.9	195	206.3	235	241.7	275	276.1	315	309.8	355	342.8	395	375.3
36	49.3	76	92.9	116	132.9	156	170.8	196	207.2	236	242.6	276	277.0	316	310.6	356	343.6	396	376.1
37	50.5	77	93.9	117	133.9	157	171.7	197	208.1	237	243.4	277	277.8	317	311.5	357	344.5	397	376.9
38	51.6	78	94.9	118	134.8	158	172.7	198	209.0	238	244.3	278	278.7	318	312.3	358	345.3	398	377.7
39	52.8	79	96.0	119	135.8	159	173.6	199	209.9	239	245.2	279	279.5	319	313.1	359	346.1	399	378.5
40	53.9	80	97.0	120	136.8	160	174.5	200	210.8	240	246.0	280	280.4	320	314.0	360	346.9	400	379.3

~~Table 19.~~Table 21. Acute Water Quality Standards for ~~dissolved~~ Dissolved Zinc
Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
1	~~NA~~ 22	41	522	81	930	121	1307	161	1665	201	2009	241	2343	281	2669	321	2987	361	3300
2	~~NA~~ 40	42	533	82	940	122	1316	162	1674	202	2018	242	2351	282	2677	322	2995	362	3307
3	~~NA~~ 57	43	544	83	950	123	1325	163	1682	203	2026	243	2360	283	2685	323	3003	363	3315
4	~~NA~~ 73	44	555	84	959	124	1334	164	1691	204	2034	244	2368	284	2693	324	3011	364	3323
5	~~NA~~ 88	45	565	85	969	125	1343	165	1700	205	2043	245	2376	285	2701	325	3019	365	3331
6	~~NA~~ 103	46	576	86	979	126	1353	166	1708	206	2051	246	2384	286	2709	326	3027	366	3338
7	~~NA~~ 117	47	587	87	988	127	1362	167	1717	207	2060	247	2392	287	2717	327	3034	367	3346
8	~~NA~~ 131	48	597	88	998	128	1371	168	1726	208	2068	248	2401	288	2725	328	3042	368	3354
9	~~NA~~ 145	49	608	89	1007	129	1380	169	1735	209	2077	249	2409	289	2733	329	3050	369	3362
10	~~NA~~ 158	50	618	90	1017	130	1389	170	1743	210	2085	250	2417	290	2741	330	3058	370	3369
11	~~NA~~ 171	51	629	91	1027	131	1398	171	1752	211	2093	251	2425	291	2749	331	3066	371	3377
12	~~NA~~ 184	52	639	92	1036	132	1407	172	1761	212	2102	252	2433	292	2757	332	3074	372	3385
13	~~NA~~ 197	53	649	93	1046	133	1416	173	1769	213	2110	253	2442	293	2765	333	3082	373	3392
14	~~NA~~ 210	54	660	94	1055	134	1425	174	1778	214	2119	254	2450	294	2773	334	3089	374	3400
15	~~NA~~ 223	55	670	95	1065	135	1434	175	1787	215	2127	255	2458	295	2781	335	3097	375	3408
16	~~NA~~ 235	56	680	96	1074	136	1443	176	1795	216	2135	256	2466	296	2789	336	3105	376	3416
17	~~NA~~ 248	57	691	97	1084	137	1452	177	1804	217	2144	257	2474	297	2797	337	3113	377	3423
18	~~NA~~ 260	58	701	98	1093	138	1461	178	1813	218	2152	258	2482	298	2805	338	3121	378	3431
19	~~NA~~ 272	59	711	99	1103	139	1470	179	1821	219	2161	259	2491	299	2813	339	3129	379	3439
20	~~NA~~ 284	60	721	100	1112	140	1479	180	1830	220	2169	260	2499	300	2821	340	3136	380	3446
21	~~NA~~ 296	61	732	101	1121	141	1488	181	1838	221	2177	261	2507	301	2829	341	3144	381	3454
22	~~NA~~ 308	62	742	102	1131	142	1497	182	1847	222	2186	262	2515	302	2837	342	3152	382	3462

~~Table 19.~~Table 21. Acute Water Quality Standards for ~~dissolved~~ Dissolved Zinc Aquatic and Wildlife ephemeral

Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L	Hard. mg/L	Std. ug/L
23	~~NA~~ 320	63	752	103	1140	143	1506	183	1856	223	2194	263	2523	303	2845	343	3160	383	3469
24	~~NA~~ 332	64	762	104	1150	144	1515	184	1864	224	2202	264	2531	304	2853	344	3168	384	3477
25	344	65	772	105	1159	145	1523	185	1873	225	2211	265	2539	305	2861	345	3175	385	3485
26	355	66	782	106	1168	146	1532	186	1881	226	2219	266	2547	306	2869	346	3183	386	3492
27	367	67	792	107	1178	147	1541	187	1890	227	2227	267	2556	307	2876	347	3191	387	3500
28	378	68	802	108	1187	148	1550	188	1898	228	2236	268	2564	308	2884	348	3199	388	3508
29	390	69	812	109	1196	149	1559	189	1907	229	2244	269	2572	309	2892	349	3207	389	3515
30	401	70	822	110	1206	150	1568	190	1916	230	2252	270	2580	310	2900	350	3214	390	3523
31	412	71	832	111	1215	151	1577	191	1924	231	2260	271	2588	311	2908	351	3222	391	3531
32	423	72	842	112	1224	152	1586	192	1933	232	2269	272	2596	312	2916	352	3230	392	3538
33	435	73	852	113	1233	153	1594	193	1941	233	2277	273	2604	313	2924	353	3238	393	3546
34	446	74	862	114	1243	154	1603	194	1950	234	2285	274	2612	314	2932	354	3245	394	3554
35	457	75	871	115	1252	155	1612	195	1958	235	2294	275	2620	315	2940	355	3253	395	3561
36	468	76	881	116	1261	156	1621	196	1967	236	2302	276	2628	316	2948	356	3261	396	3569
37	479	77	891	117	1270	157	1630	197	1975	237	2310	277	2636	317	2956	357	3269	397	3577
38	490	78	901	118	1279	158	1638	198	1984	238	2318	278	2645	318	2964	358	3276	398	3584
39	501	79	911	119	1289	159	1647	199	1992	239	2327	279	2653	319	2971	359	3284	399	3592
40	512	80	920	120	1298	160	1656	200	2001	240	2335	280	2661	320	2979	360	3292	400	3599

~~Table 21.~~Table 22. Acute Water Quality Standards for Pentachlorophenol ~~Acute~~ Aquatic and Wildlife coldwater, warmwater and edw

pH	ug/L	pH	ug/L
3	0.163	7	9.070
3.1	0.180	7.1	10.029
3.2	0.199	7.2	11.090
3.3	0.220	7.3	12.262
3.4	0.243	7.4	13.558
3.5	0.269	7.5	14.992
3.6	0.298	7.6	16.577
3.7	0.329	7.7	18.329
3.8	0.364	7.8	20.267
3.9	0.402	7.9	22.410
4	0.445	8	24.779
4.1	0.492	8.1	27.399
4.2	0.544	8.2	30.296
4.3	0.601	8.3	33.498
4.4	0.665	8.4	37.040
4.5	0.735	8.5	40.956
4.6	0.813	8.6	45.286
4.7	0.899	8.7	50.074
4.8	0.994	8.8	55.368
4.9	1.099	8.9	61.222
5	1.215	9	67.694
5.1	1.344	9.1	74.851
5.2	1.486	9.2	82.765
5.3	1.643	9.3	91.515
5.4	1.817	9.4	101.190
5.5	2.009	9.5	111.888
5.6	2.221	9.6	123.717
5.7	2.456	9.7	136.797

~~Table 22.~~Table 23. Chronic Water Quality Standards for Pentachlorophenol ~~Chronic~~ Aquatic and Wildlife coldwater, warmwater and edw

pH	ug/L	pH	ug/L
3	0.103	7	5.726
3.1	0.114	7.1	6.331
3.2	0.126	7.2	7.001
3.3	0.139	7.3	7.741
3.4	0.154	7.4	8.559
3.5	0.170	7.5	9.464
3.6	0.188	7.6	10.465
3.7	0.208	7.7	11.571
3.8	0.230	7.8	12.794
3.9	0.254	7.9	14.147
4	0.281	8	15.643
4.1	0.311	8.1	17.296
4.2	0.343	8.2	19.125
4.3	0.380	8.3	21.147
4.4	0.420	8.4	23.383
4.5	0.464	8.5	25.855
4.6	0.513	8.6	28.588
4.7	0.568	8.7	31.611
4.8	0.628	8.8	34.953
4.9	0.694	8.9	38.648
5	0.767	9	42.734
5.1	0.848	9.1	47.252
5.2	0.938	9.2	52.248
5.3	1.037	9.3	57.772
5.4	1.147	9.4	63.880
5.5	1.268	9.5	70.633
5.6	1.402	9.6	78.101
5.7	1.550	9.7	86.358

~~Table 23.~~Table 24. Acute Water Quality Standards for Pentachlorophenol ~~Acute~~ Aquatic and Wildlife ephemeral

pH	ug/L	pH	ug/L
3	0.660	7	36.760
3.1	0.730	7.1	40.646
3.2	0.807	7.2	44.943
3.3	0.892	7.3	49.695
3.4	0.986	7.4	54.949
3.5	1.091	7.5	60.758
3.6	1.206	7.6	67.182
3.7	1.334	7.7	74.284
3.8	1.475	7.8	82.138
3.9	1.631	7.9	90.822
4	1.803	8	100.424
4.1	1.994	8.1	111.041
4.2	2.204	8.2	122.781
4.3	2.437	8.3	135.762
4.4	2.695	8.4	150.115
4.5	2.980	8.5	165.985
4.6	3.295	8.6	183.534
4.7	3.643	8.7	202.938
4.8	4.029	8.8	224.393
4.9	4.454	8.9	248.117
5	4.925	9	274.349
5.1	5.446	9.1	303.354
5.2	6.022	9.2	335.426
5.3	6.659	9.3	370.888
5.4	7.363	9.4	410.100
5.5	8.141	9.5	453.457
5.6	9.002	9.6	501.398
5.7	9.953	9.7	554.408

~~Table 21.~~Table 22. Acute Water Quality Standards for Pentachlorophenol ~~Acute~~ Aquatic and Wildlife coldwater, warmwater and edw

pH	ug/L	pH	ug/L
5.8	2.716	9.8	151.260
5.9	3.003	9.9	167.252
6	3.320	10	184.934
6.1	3.671	10.1	204.486
6.2	4.059	10.2	226.105
6.3	4.488	10.3	250.010
6.4	4.963	10.4	276.442
6.5	5.488	10.5	305.668
6.6	6.068	10.6	337.984
6.7	6.709	10.7	373.717
6.8	7.419	10.8	413.228
6.9	8.203	10.9	456.916
		11	505.223

~~Table 22.~~Table 23. Chronic Water Quality Standards for Pentachlorophenol ~~Chronic~~ Aquatic and Wildlife coldwater, warmwater and edw

pH	ug/L	pH	ug/L
5.8	1.714	9.8	95.488
5.9	1.896	9.9	105.583
6	2.096	10	116.746
6.1	2.318	10.1	129.089
6.2	2.563	10.2	142.736
6.3	2.833	10.3	157.827
6.4	3.133	10.4	174.513
6.5	3.464	10.5	192.963
6.6	3.831	10.6	213.364
6.7	4.235	10.7	235.922
6.8	4.683	10.8	260.864
6.9	5.178	10.9	288.444
		11	318.939

~~Table 23.~~Table 24. Acute Water Quality Standards for Pentachlorophenol ~~Acute~~ Aquatic and Wildlife ephemeral

pH	ug/L	pH	ug/L
5.8	11.006	9.8	613.021
5.9	12.169	9.9	677.832
6	13.456	10	749.495
6.1	14.878	10.1	828.735
6.2	16.451	10.2	916.351
6.3	18.191	10.3	1013.231
6.4	20.114	10.4	1120.354
6.5	22.240	10.5	1238.802
6.6	24.591	10.6	1369.773
6.7	27.191	10.7	1514.590
6.8	30.066	10.8	1674.718
6.9	33.245	10.9	1851.775
		11	2047.552

~~Table 24.~~Table 25. Acute Criteria for Total Ammonia (in ~~mg N / L~~ mg/L as N) Aquatic and Wildlife coldwater, warmwater, and edw

pH	A&Wc	A&Ww and A&W edw
6.5	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

~~Table 24.~~Table 25. Acute Criteria for Total Ammonia (in ~~mg N / L~~ mg/L as N)
Aquatic and Wildlife coldwater, warmwater, and edw

pH	A&Wc	A&Ww and A&W edw
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	0.885	1.32

~~Table 25.~~Table 26. Chronic Criteria for Total Ammonia (~~in mg N / L~~ mg/L as N)
~~for A&Wc, and A&Ww Designated Uses~~ Aquatic and Wildlife coldwater, warmwater, and edw

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

Appendix B. ~~List of~~ Surface Waters and Designated Uses
~~Abbreviations~~

~~River Basins~~
~~BW = Bill Williams~~
~~CM = Colorado Mainstem (includes Red Lake)~~
~~LC = Little Colorado~~
~~MG = Middle Gila (includes Gila River below San Carlos Indian Reservation, Salt River below Granite Reef Dam and Phoenix area waterbodies)~~
~~RM = Rios de Mexico (includes Rio Magdalena, Rio Sonoita, and Rio Yaqui Basins)~~
~~SC = Santa Cruz~~
~~SP = San Pedro~~
~~SR = Salt River (includes Salt River and tributaries above Granite Reef Dam)~~
~~UG = Upper Gila (includes Gila River and tributaries above San Carlos Indian Reservation)~~
~~VR = Verde River~~
~~WP = Wilcox Playa~~

~~**Designated Uses**~~
~~A&Wc = Aquatic and Wildlife cold water~~
~~A&Ww = Aquatic and Wildlife warm water~~
~~A&We = Aquatic and Wildlife ephemeral~~
~~A&Wedw = Aquatic and Wildlife effluent dependent water~~
~~FBC = Full-body Contact~~
~~PBC = Partial-body Contact~~
~~DWS = Domestic Water Source~~
~~FC = Fish Consumption~~
~~AgI = Agricultural Irrigation~~
~~AgL = Agricultural Livestock Watering~~

~~**Other**~~
~~U = Unique Water~~
~~EDW = Effluent-dependent Water~~
~~WWTP = Wastewater Treatment Plant~~
~~Km = kilometers~~

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
BW	Alamo Lake	34°14'45"/113°35'00"	Deep		A&Ww			FBC			FC		AgL
BW	Big Sandy River	~~Tributary to the Santa Maria River~~ Headwaters to confluence at Alamo Lake at 34°18'36"/113°31'34"			A&Ww			FBC			FC		AgL
BW	Bill Williams River	~~Tributary to the~~ Alamo Lake to confluence with Colorado River at 34°18'04"/114°08'10"			A&Ww			FBC			FC		AgL
BW	Blue Tank	34°40'14"/112°58'16"			A&Ww			FBC			FC		AgL
BW	Boulder Creek	Headwaters to confluence with unnamed tributary at 34°41'14"/113°03'34"		A&Wc				FBC			FC	AgI	AgL
BW	Boulder Creek	Below confluence with unnamed tributary to confluence with Burro Creek at 34°36'47"/113°18'00"			A&Ww			FBC			FC	AgI	AgL
BW	Burro Creek ~~(Unique Water)~~ (OAW)	Headwaters to confluence with Boulder Creek at 34°36'47"/113°18'00"			A&Ww			FBC			FC		AgL
BW	Burro Creek	Below confluence with Boulder Creek to confluence with Big Sandy River at 34°32'24"/113°34"19.2"			A&Ww			FBC			FC		AgL
BW	Conger Creek	Headwaters to confluence with unnamed tributary at 34°45'13"/113°05'45"		A&Wc				FBC			FC		AgL
BW	Conger Creek	Below confluence with unnamed tributary to confluence with Burro Creek at 34°46"05"/113°12'54"			A&Ww			FBC			FC		AgL
BW	Coors Lake	34°36'20"/113°11'25"	Igneous		A&Ww			FBC			FC		
BW	Copper Basin Wash	Headwaters to confluence with unnamed tributary at 34°28'11"/112°35'31"		A&Wc				FBC			FC		AgL
BW	Copper Basin Wash	Below confluence with unnamed tributary to Skull Valley Wash at 34°25'55"/112°41'42"				A&We			PBC				AgL
BW	Cottonwood Canyon	Headwaters to Bear Trap Spring at 34°45'10"/112°52'32"		A&Wc				FBC			FC		AgL
BW	Cottonwood Canyon	Below Bear Trap Spring to confluence at Smith Canyon at 34°37'34"/112°54'46.8"			A&Ww			FBC			FC		AgL
BW	Date Creek	~~Tributary to the~~ Headwaters to confluence with Santa Maria River at 34°18'11"/113°29'53"			A&Ww			FBC			FC		AgL
BW	Francis Creek ~~(Unique Water)~~ (OAW)	~~Tributary to~~ Headwaters to confluence with Burro Creek at 34°44'28"/113°14'35"			A&Ww			FBC		DWS	FC	AgI	AgL
BW	Kirkland Creek	~~Tributary to~~ Headwaters to confluence with Santa Maria River at 34°32'02"/112°59'38"			A&Ww			FBC			FC	AgI	AgL
BW	Knight Creek	~~Tributary to the~~ Headwaters to confluence with Big Sandy River at 34°55'16"/113°37'30"			A&Ww			FBC			FC		AgL
BW	~~Peoples~~ Peeples Canyon ~~(Unique Water)~~ (OAW)	~~Tributary to the~~ Headwaters to confluence with Santa Maria River at 34°20'35"/113°15'11"			A&Ww			FBC			FC		AgL
BW	Santa Maria River	~~Tributary to the Bill Williams River~~ Headwaters to confluence with Alamo Lake at 34°18'36"/113°31'34"			A&Ww			FBC			FC	AgI	AgL
BW	Trout Creek	Headwaters to confluence with unnamed tributary at 35°06'47"/113°13'01"		A&Wc				FBC			FC		AgL
BW	Trout Creek	Below confluence with unnamed tributary to confluence with Knight Creek at 34°55'16"/113°37'30"			A&Ww			FBC			FC		AgL
~~CM~~	~~A-10 Backwater~~	~~33°31'38"/114°33'19"~~			~~A&Ww~~			~~FBC~~			~~FC~~		

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
~~CM~~	~~A-7 Backwater~~	~~33°34'39"/114°39'42"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~	~~Adobe Lake~~	~~33°02'39"/114°39'19"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~ CG	Agate Canyon Creek	~~Grand Canyon, tributary to~~ Headwaters to confluence with the Colorado River at 36°08'38"/112°16'48"			A&Ww			FBC			FC		
~~CM~~ CG	Beaver Dam Wash	~~Tributary to the~~ Headwaters to confluence with the Virgin River at 36°53'42"/113°55'09"			A&Ww			FBC			FC		AgL
~~CM~~ CG	Big Springs Tank	36°36'10"/112°20'58"		A&Wc				FBC			FC		AgL
~~CM~~ CG	Boucher Creek	~~Grand Canyon, tributary to~~ Headwaters to confluence with the Colorado River at 36°06'54"/112°13'44"			A&Ww			FBC			FC		
~~CM~~ CG	Bright Angel Creek	Headwaters to ~~confluence with~~ Roaring Springs Canyon at 36°11'34"/112°01'54"		A&Wc				FBC			FC		
~~CM~~ CG	Bright Angel Creek	Below ~~confluence with~~ Roaring Spring Canyon to Colorado River at 36°05'56"/112°05'27.6"			A&Ww			FBC			FC		
CG	Bright Angel Wash	Headwaters to South Rim of Grand Canyon WWTP outfall at 36°02'59"/112°09'02"				A&We			PBC				
~~CM~~ CG	Bright Angel Wash (EDW)	South ~~rim~~ Rim Grand Canyon WWTP outfall at 36°00'11"/112°39'06" to Coconino Wash					A&Wedw		PBC				AgL
~~CM~~ CG	Bulrush Canyon Wash	~~Tributary to~~ Headwaters to confluence with Kanab Creek at 36°46'55"/112°37'08"				A&We			PBC				
~~CM~~ CG	Cataract Creek	Headwaters to Santa Fe Reservoir		A&Wc				FBC		DWS	FC	AgI	AgL
~~CM~~ CG	Cataract Creek	Santa Fe Reservoir to Williams WWTP outfall at 35°15'40"/112°10'40"		A&Wc				FBC			FC	AgI	AgL
~~CM~~ CG	Cataract Creek (EDW)	Williams WWTP outfall to 1 km downstream					A&Wedw		PBC				
~~CM~~	~~Cataract Creek~~	~~Below 1 km downstream of Williams WWTP outfall to confluence of Red Lake Wash~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~CM~~ CG	Cataract Creek	Red Lake Wash to Havasupai Reservation at 33°56'52"/112°30'38.3"				A&We			PBC				AgL
~~CM~~ CG	Cataract Lake	35°15'05"/112°12'58"	Igneous	A&Wc				FBC		DWS	FC		AgL
~~CM~~ CG	Chuar Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°11'36"/111°52'17"		A&Wc				FBC			FC		
~~CM~~ CG	Chuar Creek	Below ~~confluence with~~ unnamed tributary at 36°11'36.4"/111°52'17" to confluence with the Colorado River at 36°08'20.4"/111°48'58.7"			A&Ww			FBC			FC		
~~CM~~	~~Cibola Lake~~	~~33°14'20"/114°40'16"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~ CG	City Reservoir	35°13'57"/112°11'23"	Igneous	A&Wc				FBC		DWS	FC		
~~CM~~ CG	Clear Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°09'12"/111°58'25"		A&Wc				FBC			FC		
~~CM~~ CG	Clear Creek	Below confluence with unnamed tributary to confluence with Colorado River at 36°04'55"/112°02'09.6"			A&Ww			FBC			FC		
~~CM~~	~~Clear Lake~~	~~33°01'57"/114°31'26"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
CG	Coconino Wash (EDW)	South Grand Canyon Sanitary District Tusayan WRF outfall at 35°58'39"/112°08'25" to 1 km downstream at 35°58'36"/112°08'54"					A&Wedw		PBC				
~~CM~~ CG	Colorado River	Lake Powell to ~~Topock~~ Lake Mead		A&Wc				FBC		DWS	FC	AgI	AgL
~~CM~~	~~Colorado River~~	~~Topock to Morelos Dam~~			~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~	~~AgI~~	~~AgL~~
~~CM~~ CG	Cottonwood Creek	Headwaters to confluence with unnamed tributary at 35°20'45.5"/113°35'31"		A&Wc				FBC			FC		AgL
~~CM~~ CG	Cottonwood Creek	Below confluence with unnamed tributary to confluence with Colorado River at 35°22'05"/113°40'04.8"			A&Ww			FBC			FC		AgL
~~CM~~ CG	Crystal Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°13'42"/112°11'48"		A&Wc				FBC			FC		
~~CM~~ CG	Crystal Creek	Below confluence with unnamed tributary to Colorado River at 36°08'06"/112°14'34.8"			A&Ww			FBC			FC		
~~CM~~ CG	Deer Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°26'16"/112°28'15.5"		A&Wc				FBC			FC		
~~CM~~ CG	Deer Creek	Below confluence with unnamed tributary to confluence with Colorado River at 36°23'20"/112°30'28.8"			A&Ww			FBC			FC		
~~CM~~ CG	Detrital Wash	~~Tributary~~ headwaters to Lake Mead at 36°02'20"/114°27'47"				A&We			PBC				
~~CM~~ CG	Dogtown Reservoir	35°12'40"/112°07'46"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
~~CM~~ CG	Dragon Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with Milk Creek at 36°12'25"/112°09'33"		A&Wc				FBC			FC		

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
~~CM~~ CG	Dragon Creek	Below confluence with Milk Creek to confluence with Crystal Creek at 36°10'12"/112°12'10.8"			A&Ww			FBC			FC		
~~CM~~ CG	Garden Creek	~~Grand Canyon, tributary~~ Headwaters to confluence with Pipe Creek at 36°05'35"/112°06'40"			A&Ww			FBC			FC		
~~CM~~ CG	Gonzalez Lake	35°15'26"/112°12'07"	Shallow	~~A&We~~	A&Ww			FBC			FC	AgI	AgL
~~CM~~ CG	Grand Wash	~~Tributary~~ Headwaters to Lake Mead at 36°15'29"/114°00'18"				A&We			PBC				
~~CM~~ CG	Grapevine Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°03'29"/112°00'00"			A&Ww			FBC			FC		
~~CM~~ CG	Grapevine Wash	~~Tributary~~ Headwaters to Lake Mead at 36°06'29"/114°00'07"				A&We			PBC				
~~CM~~ CG	Hakatai Canyon Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°14'42"/112°22'59"			A&Ww			FBC			FC		
~~CM~~ CG	Hance Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°02'46"/111°57'07"			A&Ww			FBC			FC		
~~CM~~ CG	Havasu Canyon Creek	~~Below~~ From the Havasupai Indian Reservation; ~~tributary~~ boundary to confluence with the Colorado River at 36°18'29"/112°45'43"			A&Ww			FBC			FC		
~~CM~~ CG	Hermit Creek	~~Grand Canyon; headwaters~~ Headwaters to Hermit Pack Trail crossing at 36°03'23"/112°13'25"		A&Wc				FBC			FC		
~~CM~~ CG	Hermit Creek	Below Hermit Pack Trail crossing to confluence with the Colorado River at 36°06'00"/112°32'04"			A&Ww			FBC			FC		
~~CM~~	~~Holy Moses Wash (EDW)~~	~~Kingman WWTP outfall to 3 km downstream~~					~~A&Wedw~~		~~PBC~~				
~~CM~~ CG	Horn Creek	~~Grand Canyon; tributary~~ Headwaters to confluence with the Colorado River at 36°05'56"/112°07'59"			A&Ww			FBC			FC		
~~CM~~ CG	Hualapai Wash	~~Tributary~~ Headwaters to Lake Mead at 36°00'40"/114°07'37"				A&We			PBC				
~~CM~~	~~Hunter's Hole Backwater~~	~~32°31'15"/114°48'03"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~CM~~	~~Imperial Reservoir~~	~~32°53'04"/114°27'40"~~			~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~	~~AgI~~	~~AgL~~
~~CM~~	~~Island Lake~~	~~33°01'52"/114°35'07"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~ CG	Jacob Lake	36°42'26"/112°13'48"	Sedimentary	A&Wc	~~A&Ww~~			FBC			FC		
~~CM~~ CG	Kaibab Lake	35°17'04"/112°09'17"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
~~CM~~ CG	Kanab Creek	~~Kanab Plateau; tributary~~ Headwaters to confluence with the Colorado River at 36°23'31"/112°37'44"			A&Ww			FBC		DWS	FC		AgL
~~CM~~ CG	Kwagunt Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°13'29"/111°55'24"		A&Wc				FBC			FC		
~~CM~~ CG	Kwagunt Creek	Below confluence with unnamed tributary to confluence with the Colorado River at 36°15'47"/111°49'40.8"			A&Ww			FBC			FC		
~~CM~~	~~Laguna Reservoir~~	~~32°51'15"/114°28'38"~~			~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~	~~AgI~~	~~AgL~~
~~CM~~	~~Lake Havasu~~	~~34°18'15"/114°08'15"~~			~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~	~~AgI~~	~~AgL~~
~~CM~~ CG	Lake Mead	36°01'00"/114°44'15"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
~~CM~~	~~Lake Mohave~~	~~35°11'45"/114°34'00"~~		~~A&Wc~~				~~FBC~~		~~DWS~~	~~FC~~	~~AgI~~	~~AgL~~
~~CM~~ CG	Lake Powell	36°57'00"/111°29'15"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
~~CM~~ CG	Lonetree Canyon Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°04'48"/112°01'52"			A&Ww			FBC			FC		
~~CM~~	~~Martinez Lake~~	~~32°58'52"/114°28'23"~~			~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~CM~~ CG	Matkatamiba Creek	Below Havasupai Indian Reservation; ~~tributary~~ to confluence with the Colorado River at 36°20'38"/112°40'19"			A&Ww			FBC			FC		
~~CM~~	~~Mittry Lake~~	~~32°49'11"/114°27'41"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~	~~Mohave Wash~~	~~Tributary to Lake Havasu at 33°28'55"/114°35'56"~~				~~A&We~~			~~PBC~~				
~~CM~~ CG	Monument Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°05'53"/112°10'55"			A&Ww			FBC			FC		
~~CM~~ CG	Nankoweap Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°15'30"/111°57'23"		A&Wc				FBC			FC		
~~CM~~ CG	Nankoweap Creek	Below confluence with unnamed tributary to Colorado River at 36°18'25"/111°51'28.8"			A&Ww			FBC			FC		
~~CM~~ CG	National Canyon Creek	~~Grand Canyon; those reaches~~ Portion of the creek that flows into the Colorado River at 36°15'25"/112°53'34.8" that is not located on the Hualapai Indian Reservation			A&Ww			FBC			FC		
~~CM~~ CG	North Canyon Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°33'57"/111°55'39"		A&Wc				FBC			FC		

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
~~CM~~ CG	North Canyon Creek	Below confluence with unnamed tributary to Colorado River at 36°37'48"/111°45'46.8"			A&Ww			FBC			FC		
~~CM~~	~~Nortons Lake~~	~~33°02'35"/114°37'58"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~ CG	Olo Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°22'16"/112°38'56"			A&Ww			FBC			FC		
~~CM~~ CG	Parashant Canyon	Headwaters to confluence with unnamed tributary at 36°21'26"/113°28'10"		A&Wc				FBC			FC		
~~CM~~ CG	Parashant Canyon	Below confluence with unnamed tributary to the Colorado River			A&Ww			FBC			FC		
~~CM~~ CG	Paria River	~~Paria Plateau; tributary~~ Utah border to the Colorado River at 36°51'29"/111°36'04"			A&Ww			FBC			FC		
~~CM~~ CG	Phantom Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°10'04"/112°07'50"		A&Wc				FBC			FC		
~~CM~~ CG	Phantom Creek	Below confluence with unnamed tributary to Colorado River at 36°06'58"/112°05'09.6"			A&Ww			FBC			FC		
~~CM~~ CG	Pipe Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°05'56"/112°06'36"			A&Ww			FBC			FC		
~~CM~~	~~Pretty Water Lake~~	~~33°19'45"/114°42'15"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~	~~Quigley Ponds~~	~~32°43'00"/113°58'00"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~ CG	Red Canyon Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°02'42"/111°55'08"			A&Ww			FBC			FC		
~~CM~~ CG	Red Lake	35°40'00"/114°03'45"			A&Ww			FBC			FC		AgL
~~CM~~ CG	Redondo Lake	32°44'32"/114°29'02"	Shallow		A&Ww			FBC			FC		
~~CM~~ CG	Roaring Springs	Headwaters of Roaring Springs Creek at 36°11'35"/112°01'55.2"		A&Wc				FBC		DWS	FC		
~~CM~~ CG	Roaring Springs Canyon	~~Grand Canyon; tributary~~ Headwaters to Bright Angel Creek at 36°11'35"/112°01'55"		A&Wc				FBC			FC		
~~CM~~ CG	Rock Canyon	Tributary to Truxton Wash at 35°26'56"/113°36'29"				A&We			PBC				
~~CM~~ CG	Royal Arch Creek	~~Grand Canyon; tributary~~ Tributary to the Colorado River at 36°11'53"/112°26'56"			A&Ww			FBC			FC		
~~CM~~ CG	Ruby Canyon Creek	~~Grand Canyon; tributary~~ Tributary to the Colorado River at 36°11'24"/112°18'54"			A&Ww			FBC			FC		
~~CM~~ CG	Russell Tank	34°52'22"/111°52'44"		A&Wc				FBC			FC		AgL
~~CM~~	~~Sacramento Wash~~	~~Tributary to Topock Marsh at 34°43'48"/114°29'13"~~				~~A&We~~			~~PBC~~				
~~CM~~ CG	Saddle Canyon Creek	~~Marble Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°21'35.5"/112°22'46"		A&Wc				FBC			FC		
~~CM~~ CG	Saddle Canyon Creek	Below confluence with unnamed tributary to Colorado River at 36°22'52"/112°23'16.8"			A&Ww			FBC			FC		
~~CM~~ CG	Santa Fe Reservoir	35°14'26"/112°11'04"	Igneous	A&Wc				FBC		DWS	FC		
~~CM~~ CG	Sapphire Canyon Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°08'49"/112°17'28"			A&Ww			FBC			FC		
~~CM~~	~~Sawmill Canyon~~	~~Headwaters to abandoned gaging station at 35°09'46.5"/113°57'51"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~CM~~	~~Sawmill Canyon~~	~~Below abandoned gaging station~~				~~A&We~~			~~PBC~~				~~AgL~~
~~CM~~ CG	Serpentine Canyon Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°12'22"/112°19'37"			A&Ww			FBC			FC		
~~CM~~ CG	Shinumo Creek	~~Grand Canyon; tributary~~ Headwaters to confluence with unnamed tributary at 36°18'21"/112°18'03"		A&Wc				FBC			FC		
~~CM~~ CG	Shinumo Creek	Below confluence with unnamed tributary to the Colorado River at 36°14'13"/112°20'52.8"			A&Ww			FBC			FC		
~~CM~~ CG	Short Creek	Tributary to the Virgin River at 36°58'23"/113°16'08"				A&We			PBC				
~~CM~~ CG	Slate Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°08'06"/112°14'42"			A&Ww			FBC			FC		
~~CM~~ CG	Spring Canyon Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°01'08"/113°21'00"			A&Ww			FBC			FC		
~~CM~~ CG	Stone Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°20'49"/112°27'14"			A&Ww			FBC			FC		
~~CM~~ CG	Tapeats Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 36°22'16"/112°28'05"		A&Wc				FBC			FC		
~~CM~~ CG	Thunder River	Tributary to Tapeats Creek at 36°23'31"/112°27'00"		A&Wc				FBC			FC		
~~CM~~	~~Topock Marsh~~	~~34°47'30"/114°31'00"~~			~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~	~~AgI~~	~~AgL~~
~~CM~~ CG	Trail Canyon Creek	~~Grand Canyon; tributary~~ Headwaters to the Colorado River at 35°50'20"/113°19'37"			A&Ww			FBC			FC		
CG	Transept Canyon	Headwaters to North Rim WWTP outfall at 36°12'20"/112°03'35"				A&We			PBC				
~~CM~~ CG	Transept Canyon (EDW)	North Rim WWTP outfall to 1 km downstream					A&Wedw		PBC				

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
CG	Transept Canyon	1 km downstream of the North Rim WWTP outfall to Bright Angel Creek				A&We			PBC				
~~CM~~ CG	Travertine Canyon Creek	~~Grand Canyon; tributary~~ Tributary to the Colorado River at 36°06'11"/112°13'05"			A&Ww			FBC			FC		
~~CM~~ CG	Truxton Wash	Tributary to Red Lake ~~Playa~~ at 35°37'23"/114°03'00"				A&We			PBC				
~~CM~~ CG	Turquoise Canyon Creek	~~Grand Canyon; tributary~~ Tributary to the Colorado River at 36°09'14"/112°18'07"			A&Ww			FBC			FC		
~~CM~~	~~Unkar Creek~~	~~Grand Canyon; headwaters to confluence with unnamed tributary at 36°07'54"/111°54'03"~~		~~A&Wc~~				~~FBC~~			~~FC~~		
~~CM~~ CG	Unkar Creek	Below ~~conf~~ confluence with unnamed tributary to confluence with Colorado River at 36°04'48"/111°52'22.8"			A&Ww			FBC			FC		
CG	Unnamed Wash (EDW)	Grand Canyon NP Desert View WWTP outfall to Cedar Canyon					A&Wedw		PBC				
CG	Unnamed Wash (EDW)	Valle Airpark WRF outfall at 35°38'34"/112°09'22" to confluence with Spring Valley Wash at 35°38'29"/112°10'47"					A&Wedw		PBC				
~~CM~~ CG	Vasey's Paradise	~~Grand Canyon;~~ A spring at 36°26'49"/111°50'46"		A&Wc				FBC			FC		
~~CM~~ CG	Virgin River	Tributary to the Colorado River at 36°47'28"/114°06'11"			A&Ww			FBC			FC	AgI	AgL
~~CM~~ CG	Vishnu Creek	~~Grand Canyon; tributary~~ Tributary to the Colorado River at 36°03'18"/111°59'42"			A&Ww			FBC			FC		
~~CM~~ CG	Warm Springs Creek	~~Grand Canyon; tributary~~ Tributary to the Colorado River at 36°11'49"/113°04'55"			A&Ww			FBC			FC		
~~CM~~	~~Wellton Canal~~	~~Yuma Canal System~~								~~DWS~~		~~AgI~~	~~AgL~~
~~CM~~	~~Wellton Ponds~~	~~32°42'15"/114°06'15"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~ CG	West Cataract Creek	Tributary to Cataract Creek at 35°15'40"/112°11'38"		A&Wc				FBC			FC		AgL
~~CM~~ CG	White Creek	~~Grand Canyon; headwaters~~ Headwaters to confluence with unnamed tributary at 36°18'42"/112°21'03"		A&Wc				FBC			FC		
~~CM~~ CG	White Creek	Below confluence with unnamed tributary to the Colorado River at 36°15'22"/112°19'30"			A&Ww			FBC			FC		
~~CM~~ CG	Wright Canyon Creek	Headwaters to confluence with unnamed tributary at 35°20'54"/113°30'35"		A&Wc				FBC			FC		AgL
~~CM~~ CG	Wright Canyon Creek	Below confluence with unnamed tributary to confluence with Truxton Wash			A&Ww			FBC			FC		AgL
~~CM~~	~~YPG Pond~~	~~32°50'22"/114°26'25"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~CM~~	~~Yuma Area Canals~~	~~Above municipal water treatment plant intakes~~								~~DWS~~		~~AgI~~	~~AgL~~
~~CM~~	~~Yuma Area Canals~~	~~Below municipal water treatment plant intakes and all drains~~										~~AgI~~	~~AgL~~
CL	A-10 Backwater	33°31'38"/114°33'19"	Shallow		A&Ww			FBC			FC		
CL	A-7 Backwater	33°34'39"/114°39'42"	Shallow		A&Ww			FBC			FC		
CL	Adobe Lake	33°02'39"/114°39'19"	Shallow		A&Ww			FBC			FC		
CL	Cibola Lake	33°31'38"/114°33'19"	Shallow		A&Ww			FBC			FC		
CL	Clear Lake	33°01'57"/114°31'26"	Shallow		A&Ww			FBC			FC		
CL	Columbus Wash	Tributary to the Gila River at 33°00'25"/113°16'08"				A&We			PBC				
CL	Colorado River	Lake Mead to Topock Marsh		A&Wc				FBC		DWS	FC	AgI	AgL
CL	Colorado River	Topock Marsh to Morelos Dam			A&Ww			FBC		DWS	FC	AgI	AgL
CL	Gila River	Painted Rock Dam to the Colorado River at 32°43'12"/114°33'14"			A&Ww			FBC			FC	AgI	AgL
CL	Holy Moses Wash	Headwaters to Kingman WWTP outfall at 35°10'30"/114°03'43"				A&We			PBC				
CL	Holy Moses Wash (EDW)	Kingman WWTP outfall to 3 km downstream					A&Wedw		PBC				
CL	Holy Moses Wash	3 km downstream of Kingman WWTP outfall to confluence with Sawmill Wash at 35°09'43"/114°04'20"				A&We			PBC				
CL	Hunter's Hole Backwater	32°31'15"/114°48'03"	Shallow		A&Ww			FBC			FC		AgL
CL	Imperial Reservoir	32°53'04"/114°27'40"	Shallow		A&Ww			FBC		DWS	FC	AgI	AgL
CL	Island Lake	33°01'52"/114°35'07"	Shallow		A&Ww			FBC			FC		
CL	Laguna Reservoir	32°51'15"/114°28'38"	Shallow		A&Ww			FBC		DWS	FC	AgI	AgL
CL	Lake Havasu	34°18'15"/114°08'15"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
CL	Lake Mohave	35°11'45"/114°34'00"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
CL	Martinez Lake	32°58'52"/114°28'23"	Shallow		A&Ww			FBC			FC	AgI	AgL
CL	Mittry Lake	32°49'11"/114°27'41"	Shallow		A&Ww			FBC			FC		
CL	Mohave Wash	Headwaters to Lake Havasu at 33°28'55"/114°35'56"				A&We			PBC				

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
CL	Nortons Lake	33°02'35"/114°37'58"	Shallow		A&Ww			FBC			FC		
CL	Painted Rock (Borrow Pit) Lake	33°05'00"/113°01'20"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
CL	Pretty Water Lake	33°19'45"/114°42'15"	Shallow		A&Ww			FBC			FC		
CL	Quigley Ponds	32°43'00"/113°58'00"	Shallow		A&Ww			FBC			FC		
CL	Sacramento Wash	Tributary to Topock Marsh at 34°43'48"/ 114°29'13"				A&We			PBC				
CL	Sawmill Canyon	Headwaters to abandoned gaging station at 35°09'46.5"/113°57'51"			A&Ww			FBC			FC		AgL
CL	Sawmill Canyon	Below abandoned gaging station to confluence with Sacramento Wash at 35°09'43"/ 113°58'01.2"				A&We			PBC				AgL
CL	Topock Marsh	34°47'30"/114°31'00"	Shallow		A&Ww			FBC		DWS	FC	AgI	AgL
CL	Unnamed Wash (EDW)	Town of Quartzsite WWTP outfall at 34°42'30"/114°13'14" to 1 km downstream at 33°42'30"/114°13'45"					A&Wedw		PBC				
CL	Wellton Canal	Wellton-Mohawk Irrigation District								DWS		AgI	AgL
CL	Wellton Ponds	32°42'15"/114°06'15"			A&Ww			FBC			FC		
CL	YPG Pond	32°50'22"/114°26'25"			A&Ww			FBC			FC		
CL	Yuma Area Canals	Above municipal water treatment plant intakes								DWS		AgI	AgL
CL	Yuma Area Canals	Below municipal water treatment plant intakes and all drains										AgI	AgL
LC	Als Lake	35°02'17"/111°25'13"	Igneous		A&Ww			FBC			FC		AgL
LC	Ashurst Lake	35°01'10"/111°24'09"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Atcheson Reservoir	34°00'00"/109°20'41"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Auger Creek	Tributary to Nutrioso Creek at 33°57'22"/ 109°12'58"		A&Wc				FBC			FC		AgL
LC	Barbershop Canyon Creek	Tributary to East Clear Creek at 34°33'00"/ 111°09'43"		A&Wc				FBC			FC		AgL
LC	Bear Canyon Creek	Tributary to General Springs Canyon at 34°32'18"/111°12'15"		A&Wc				FBC			FC		AgL
LC	Bear Canyon Creek	Tributary to Willow Creek at 34°27'29"/ 111°00'00"		A&Wc				FBC			FC		AgL
LC	Bear Canyon Lake	34°24'10"/111°00'09"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Becker Lake	34°09'16"/109°18'18"	Shallow	A&Wc				FBC			FC		AgL
LC	Billy Creek	Tributary to Show Low Creek at 34°12'25"/ 110°00'00"		A&Wc				FBC			FC		AgL
LC	Black Canyon Creek	Tributary to Chevelon Creek at 34°47'38"/ 110°36'22"		A&Wc				FBC			FC	AgI	AgL
LC	Black Canyon Lake	34°19'50"/110°41'59"	Sedimentary	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Blue Ridge Reservoir	34°33'15"/111°11'01"	Deep	A&Wc				FBC			FC	AgI	AgL
LC	Boot Lake	34°58'53"/111°20'00"	Igneous	A&Wc	~~A&Ww~~			FBC			FC		AgL
LC	Bow and Arrow Wash (EDW)	Estates at Pine Canyon WWTP outfall #1 at 35°09'31"/111°38'24" to confluence with Rio de Flag at 35°10'35"/111°36'42"					A&Wedw		PBC				
LC	Buck Springs Canyon Creek	Tributary to Leonard Canyon Creek at 34°28'52"/111°05'24"		A&Wc				FBC			FC		AgL
LC	Bunch Reservoir	34°02'12"/109°26'45"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Camillo Tank	34°55'03"/111°22'41"	Igneous		A&Ww			FBC			FC		AgL
LC	Carnero Lake	34°06'57"/109°31'39"	Shallow	A&Wc				FBC			FC		AgL
LC	Chevelon Canyon Lake	34°30'39"/110°49'28"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Chevelon Creek	Tributary to the Little Colorado River at 34°57'04"/110°31'30"		A&Wc				FBC			FC	AgI	AgL
LC	Chevelon Creek, West Fork	Tributary to Chevelon Creek at 34°36'58"/ 110°46'05"		A&Wc				FBC			FC		AgL
LC	Chilson Tank	34°51'46"/111°22'52"	Igneous		A&Ww			FBC			FC		AgL
~~LC~~	~~Cholla Lake~~	~~34°56'00"/110°17'12"~~			~~A&Ww~~			~~FBC~~			~~FC~~		
LC	Clear Creek	Tributary to the Little Colorado River at 34°59'13"/110°38'17"		A&Wc				FBC		DWS	FC		AgL
LC	Clear Creek Reservoir	34°58'10"/110°38'33"	Shallow	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Coconino Reservoir	35°00'16"/111°23'52"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Colter Creek	Tributary to Nutrioso Creek at 33°58'19"/ 109°12'29"		A&Wc				FBC			FC		AgL
LC	Colter Reservoir	33°56'40"/109°28'50"	Shallow	A&Wc				FBC			FC		AgL
LC	Concho Creek	Tributary to Carrizo Wash at 34°36'25"/ 109°33'54"		A&Wc				FBC			FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
LC	Concho Lake	34°26'36"/109°37'40"	Shallow	A&Wc				FBC			FC	AgI	AgL
LC	Cow Lake	34°53'19"/111°18'49"	Igneous		A&Ww			FBC			FC		AgL
LC	Coyote Creek	Tributary to the Little Colorado River at 34°18'22"/109°20'53"		A&Wc				FBC			FC	AgI	AgL
LC	Crisis Lake (Snake Tank #2)	34°47'51"/111°17'01"			A&Ww			FBC			FC		AgL
LC	Dane Canyon Creek	Tributary to Barbershop Canyon Creek at 34°30'29"/111°09'07"		A&Wc				FBC			FC		AgL
LC	Daves Tank	34°44'23"/111°17'08"			A&Ww			FBC			FC		AgL
LC	Deep Lake	35°03'30"/111°24'55"	Igneous		A&Ww			FBC			FC		AgL
LC	Dry Lake (EDW)	34°37'52"/110°23'40"	Igneous				A&Wedw		PBC				
LC	Ducksnest Lake	34°59'15"/111°23'53"			A&Ww			FBC			FC		AgL
LC	East Clear Creek	Tributary to Clear Creek at 34°38'31"/ 110°59'49"		A&Wc				FBC			FC	AgI	AgL
LC	Ellis Wiltbank Reservoir	34°05'25"/109°28'24"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Fish Creek	Tributary to the Little Colorado River at 34°04'05"/109°26'49"		A&Wc				FBC			FC		AgL
LC	Fool's Hollow Lake	34°16'14"/110°04'15"	Igneous	A&Wc				FBC			FC		AgL
LC	General Springs Canyon Creek	Tributary to East Clear Creek at 34°32'17"/ 111°12'18"		A&Wc				FBC			FC		AgL
LC	Geneva Reser-voir	34°01'44"/109°31'44"	Igneous		A&Ww			FBC			FC		AgL
LC	Hall Creek	Tributary to the Little Colorado River at 34°03'58"/109°27'07"		A&Wc				FBC			FC	AgI	AgL
LC	Hart Canyon Creek	Tributary to Willow Creek at 34°30'40"/ 110°59'28"		A&Wc				FBC			FC		AgL
LC	Hay Lake	34°00'11"/109°25'55"	Igneous	A&Wc	~~A&Ww~~			FBC			FC		AgL
LC	Hog Wallow Lake	33°58'57"/109°25'38"	Igneous	A&Wc	~~A&Ww~~			FBC			FC	AgI	AgL
LC	Horse Lake	35°03'53"/111°27'51"			A&Ww			FBC			FC		AgL
LC	Huffer Tank	34°27'45"/111°23'09"			A&Ww			FBC			FC		AgL
LC	Hulsey Creek	Tributary to Nutrioso Creek at 33°56'28"/ 109°11'28"		A&Wc				FBC			FC		AgL
LC	Hulsey Lake	33°55'57"/109°09'33"	Sedimentary	A&Wc				FBC			FC		AgL
LC	Indian Lake	35°00'38"/111°22'37"			A&Ww			FBC			FC		AgL
LC	Jack's Canyon Creek	Tributary to the Little Colorado River at 35°00'07"/110°39'07"		A&Wc				FBC			FC	AgI	AgL
LC	Jarvis Lake	33°58'59"/109°12'33"	Sedimentary		A&Ww			FBC			FC		AgL
LC	Kinnikinick Lake	34°53'52"/111°18'20"	Igneous	A&Wc				FBC			FC		AgL
LC	Knoll Lake	34°25'38"/111°05'10"	Sedimentary	A&Wc				FBC			FC		AgL
LC	Lake Hum-phreys (EDW)	35°11'51"/111°35'16"					A&Wedw		PBC				
LC	Lake Mary, Lower	35°06'22"/111°34'20"	Igneous	A&Wc				FBC		DWS	FC		AgL
LC	Lake Mary, Upper	35°04'45"/111°31'56"	Igneous	A&Wc				FBC		DWS	FC		AgL
LC	Lake of the Woods	34°09'39"/109°58'45"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Lee Valley Creek ~~(UW)~~ (OAW)	Headwaters to Lee Valley Reservoir		A&Wc				FBC			FC		
LC	Lee Valley Creek	From Lee Valley Reservoir to the East Fork of the Little Colorado River at 33°56'35"/ 109°29'06"		A&Wc				FBC			FC		AgL
LC	Lee Valley Reservoir	33°56'30"/109°30'00"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Leonard Canyon Creek	Tributary to Clear Creek at 34°37'26"/ 111°02'20"		A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, East Fork	Tributary to Leonard Canyon Creek at 34°25'52"/111°05'06"		A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, Middle Fork	Tributary to Leonard Canyon, West Fork at 34°26'17"/111°06'47"		A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, West Fork	Tributary to Leonard Canyon, East Fork at 34°28'01"/111°05'28"		A&Wc				FBC			FC		AgL
LC	Lily Creek	Tributary to Coyote Creek at 33°59'46"/ 109°03'58"		A&Wc				FBC			FC		AgL
LC	Little Colorado River	Headwaters to Lyman Reservoir		A&Wc				FBC			FC	AgI	AgL
LC	Little Colorado River	Below Lyman Reservoir, to confluence with the Puerco River at 34°53'20"/110°07'41"		A&Wc				FBC		DWS	FC	AgI	AgL
LC	Little Colorado River	Below confluence with Puerco River to the boundary of the Navajo Nation			A&Ww			FBC		DWS	FC	AgI	AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
LC	Little Colorado River, East Fork	Tributary to the Little Colorado River at 34°00'14"/109°27'22"		A&Wc				FBC			FC		AgL
LC	Little Colorado River, South Fork	Tributary to the Little Colorado River at 34°05'20"/109°24'58"		A&Wc				FBC			FC		AgL
LC	Little Colorado River, West Fork ~~(Unique Water)~~ (OAW)	Headwaters to Government Springs at 33°59'33"/109°27'52"		A&Wc				FBC			FC		
LC	Little Colorado River, West Fork	Below Government Springs to the Little Colorado River at 34°00'14"/109°27'21.6"		A&Wc				FBC			FC		AgL
LC	Little George Reservoir	34°00'37"/109°19'15"	Igneous		A&Ww			FBC			FC	AgI	
LC	Little Mormon Lake	34°17'00"/109°58'03"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Little Ortega Lake	34°22'45"/109°40'00"	Igneous	~~A&Ww~~ A&Wc				FBC			FC		
LC	Long Lake, Lower	34°46'45"/111°12'00"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Long Lake, Upper	35°00'00"/111°21'00"	Igneous	A&Wc	~~A&Ww~~			FBC			FC		AgL
LC	Long Tom Tank	34°20'37"/110°49'20"		A&Wc				FBC			FC		AgL
LC	Lower Walnut Canyon Lake (EDW)	35°12'04"/111°34'07"					A&Wedw		PBC				
LC	Lyman Reservoir	34°21'30"/109°21'30"	Deep	A&Wc				FBC			FC	AgI	AgL
LC	Mamie Creek	Tributary to Coyote Creek at 33°59'24"/109°03'50"		A&Wc				FBC			FC		AgL
LC	Marshall Lake	35°07'10"/111°32'01"	Igneous	A&Wc				FBC			FC		AgL
LC	McKay Reservoir	34°01'27"/110°29'07"		A&Wc				FBC			FC	AgI	AgL
LC	Merritt Draw Creek	Tributary to Barbershop Canyon Creek at 34°29'38"/111°09'54"		A&Wc				FBC			FC		AgL
LC	Mexican Hay Lake	34°01'57"/109°21'25"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Milk Creek	Tributary to Hulsey Creek at 33°56'31"/109°11'17"		A&Wc				FBC			FC		AgL
LC	Miller Canyon Creek	Tributary to East Clear Creek at 34°33'00"/111°14'17"		A&Wc				FBC			FC		AgL
LC	Miller Canyon Creek, East Fork	Tributary to Miller Canyon Creek at 34°30'18"/111°14'53"		A&Wc				FBC			FC		AgL
LC	Mineral Creek	Tributary to Little Ortega Lake at 34°22'52"/109°39'50"		A&Wc				FBC			FC	AgI	AgL
LC	Mormon Lake	34°56'40"/111°27'10"	Shallow	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Morton Lake	34°53'36"/111°17'39"	Igneous	A&Wc				FBC			FC		AgL
LC	Mud Lake	34°55'24"/111°21'18"	Shallow		A&Ww			FBC			FC		AgL
LC	Ned Lake (EDW)	32°17'18"/110°03'20"	EDW				A&Wedw		PBC				
LC	Nelson Reservoir	34°03'12"/109°11'18"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Norton Reservoir	34°03'57"/109°31'21"	Igneous		A&Ww			FBC			FC		AgL
LC	Nutrioso Creek	Tributary to the Little Colorado River at 34°09'04"/109°17'35"		A&Wc				FBC			FC	AgI	AgL
LC	Paddy Creek	Tributary to Nutrioso Creek at 33°54'47"/109°10'16"		A&Wc				FBC			FC		AgL
LC	Phoenix Park Wash	Tributary to Dry Lake at 34°37'30"/110°22'12"				A&We			PBC				
LC	Pierce Seep	34°23'35"/110°31'22"		A&Wc					PBC				
LC	Pine Tank	34°46'49"/111°17'17"	Igneous		A&Ww			FBC			FC		AgL
LC	Pintail Lake (EDW)	34°18'06"/110°01'17"	EDW				A&Wedw		PBC				
LC	Pool Corral Lake	33°58'16"/109°24'53"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Porter Creek	Tributary to Show Low Creek at 34°10'16"/109°58'48"		A&Wc				FBC			FC		AgL
LC	Potato Lake	34°27'44"/111°20'42"	Igneous	A&Wc				FBC			FC		AgL
LC	Pratt Lake	34°01'31"/109°04'16"	Sedimentary	A&Wc				FBC			FC		
LC	Puerco River	Tributary to the Little Colorado River at 34°53'20"/110°07'41"			A&Ww			FBC		DWS	FC	AgI	AgL
LC	Puerco River (EDW)	Sanders Unified School District WWTP outfall at 35°12'52"/109°19'40" to 0.5 km downstream at 35°12'39"/109°19'52"					A&Wedw		PBC				
LC	Rainbow Lake	34°09'03"/109°59'01"	Shallow Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Reagan Reservoir	34°02'09"/109°08'43"	Igneous		A&Ww			FBC			FC		AgL
LC	Rio de Flag	Headwaters to Flagstaff WWTP outfall at 35°12'21"/111°39'17"				A&We			PBC				

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
LC	Rio de Flag (EDW)	Flagstaff WWTP outfall at 35°12'21"/ 111°39'17" to the confluence with San Francisco Wash ~~at 35°14'04"/111°28'02.5"~~					A&Wedw		PBC				
LC	River Reservoir	34°02'01"/109°26'07"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Rogers Reservoir	33°58'30"/109°16'18"	Igneous		A&Ww			FBC			FC		AgL
LC	Rudd Creek	Tributary to Nutrioso Creek at 34°04'12"/ 109°11'56"		A&Wc				FBC			FC		AgL
LC	Russel Reservoir	33°59'29"/109°20'00"	Igneous		A&Ww			FBC			FC	AgI	AgL
~~LC~~	~~San Salvador Reservoir~~	~~33°58'51"/109°19'51"~~			~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
LC	Salt House Lake	33°57'06"/109°20'12"	Igneous		A&Ww			FBC			FC		AgL
LC	San Salvador Reservoir	33°58'51"/109°19'51"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Scott Reservoir	34°10'27"/109°57'27"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Show Low Creek	Tributary to Silver Creek at 34°25'26"/ 110°04'05"		A&Wc				FBC			FC	AgI	AgL
LC	Show Low Lake	34°11'25"/109°59'55"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Silver Creek	Tributary to the Little Colorado River at 34°44'24"/110°02'17"		A&Wc				FBC			FC	AgI	AgL
LC	Slade Reservoir	33°59'50"/109°20'00"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Soldiers Annex Lake	34°47'13"/111°13'48"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Soldiers Lake	34°47'49"/110°13'59"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Spaulding Tank	34°30'17"/111°02'03"			A&Ww			FBC			FC		AgL
LC	Sponseller Lake	34°14'10"/109°50'42"	Igneous	A&Wc				FBC			FC		AgL
LC	St Johns Reservoir (Little Reservoir)	34°29'14"/109°21'57"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Telephone Lake (EDW)	34°17'35"/110°02'39"	EDW				A&Wedw		PBC				
LC	Tremaine Lake	34°46'00"/111°14'10"	Igneous	A&Wc				FBC			FC		AgL
LC	Tunnel Reservoir	34°01'51"/109°26'32"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Turkey Draw (EDW)	High Country Pines II WWTP outfall at 34°25'35"/110°38'13" to confluence of Turkey Draw with Black Canyon Creek at 34°25'20"/110°36'36"					A&Wedw		PBC				
LC	Unnamed Wash (EDW)	Bison Ranch WWTP outfall at 34°23'31"/ 110°31'41" to Pierce Seep at 34°23'35"/ 110°31'22"					A&Wedw		PBC				
LC	Unnamed Wash (EDW)	Black Mesa Ranger Station WWTP outfall at 34°23'32"/110°53'32" to confluence of Oklahoma Flat Draw with Pierce Wash at 34°26'47"/110°29'25"					A&Wedw		PBC				
LC	Unnamed Wash (EDW)	Estates at Pine Canyon WWTP outfall at 35°09'17"/111°38'22" to confluence of unnamed wash with Bow Wash and Arrow Wash at 35°09'51"/111°27'29"					A&Wedw		PBC				
LC	Unnamed Wash (EDW)	Estates at Pine Canyon WWTP outfall #3 at 35°09'45"/111°38'48 to confluence with Rio de Flag at 35°10'05"/111°38'37					A&Wedw		PBC				
LC	Vail Lake	35°05'24"/111°30'42"	Igneous	A&Wc				FBC			FC		AgL
LC	Walnut Creek	Tributary to Billy Creek at 34°09'50"/ 109°58'48"		A&Wc				FBC			FC		AgL
LC	Water Canyon Creek	Tributary to the Little Colorado River at 34°06'47"/109°18'43"		A&Wc				FBC			FC		AgL
LC	Water Canyon Reservoir	34°00'15"/109°20'05"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Whale Lake (EDW)	35°12'32"/111°34'42"	EDW				A&Wedw		PBC				
LC	Whipple Lake	34°16'47"/109°58'28"	Igneous		A&Ww			FBC			FC		AgL
LC	White Mountain Lake	34°21'54"/109°59'38"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	White Mountain Reservoir	34°00'15"/109°30'48"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Willow Creek	Tributary to Clear Creek at 34°38'31"/ 110°59'49"		A&Wc				FBC			FC		AgL
LC	Willow Springs Canyon Creek	Tributary to Chevelon Creek at 34°21'32"/ 110°53'20"		A&Wc				FBC			FC		AgL
LC	Willow Springs Lake	34°18'45"/110°52'34"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Woodland Reservoir	34°07'36"/109°57'06"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Woods Canyon Creek	Tributary to Chevelon Creek at 34°21'32"/ 110°53'20"		A&Wc				FBC			FC		AgL
LC	Woods Canyon Lake	34°20'05"/110°56'35"	Sedimentary	A&Wc				FBC		~~DWS~~	FC	AgI	AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
LC	Zuni River	Tributary to the Little Colorado River at 34°38'42"/109°40'26"		A&Wc				FBC			FC	AgI	AgL
~~LG~~	~~Columbus Wash~~	~~Tributary to the Gila River at 33°00'25"/113°16'08"~~				~~A&We~~			~~PBC~~				
~~LG~~	~~Gila River~~	~~Painted Rock Dam to the Colorado River at 32°43'12"/114°33'14"~~			~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~LG~~	~~Painted Rock (Borrow Pit) Lake~~	~~33°05'00"/113°01'20"~~			~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
MG	Agua Fria River	Headwaters to confluence with unnamed EDW wash at 34°35'43"/112°16'29", receiving treated wastewater from the Prescott Valley WWTP				A&We			PBC				AgL
MG	Agua Fria River (EDW)	Below confluence with unnamed wash receiving treated wastewater from the Prescott Valley WWTP to State Route 169 at 34°31'43"/112°14'7.5"					A&Wedw		PBC				AgL
MG	Agua Fria River	State Route 169 to Lake Pleasant at 34°54'54.7"/112°14'7.5"			A&Ww			FBC		DWS	FC	AgI	AgL
MG	Agua Fria River	Below Lake Pleasant to the El Mirage WWTP at 33°34'36"/112°48'45"				A&We			PBC				AgL
MG	Agua Fria River (EDW)	El Mirage WWTP to 2 km downstream					A&Wedw		PBC				
MG	Agua Fria River	Below 2 km downstream of the El Mirage WWTP to ~~State Highway 85~~ Avondale WWTP outfall				A&We			PBC				
~~MG~~	~~Agua Fria River~~	~~Below State Highway 85~~			~~A&Ww~~			~~FBC~~			~~FC~~		
MG	Agua Fria River	Avondale WWTP outfall at 33°23'24"/112°21'50.4" to Gila River at 33°23'22"/112°21'48"					A&Wedw		PBC				
MG	Alvord Park Lake	Municipal Park Lake: 35th Avenue & Baseline Road, Phoenix at 33°22'34"/112°08'11"	Urban		A&Ww				PBC		FC		
MG	Andorra Wash (EDW)	Town of Cave Creek WWTP outfall #1 at 33°50'00"/111°56'32" to confluence with Cave Creek Wash at 33°49'54"/111°57'57.4"					A&Wedw		PBC				
MG	Antelope Creek	Tributary to Martinez Creek at 34°16'37"/112°08'46"			A&Ww			FBC			FC		AgL
MG	Arlington Canal	~~Above Wilson Avenue~~ From Gila River at 33°20'54"/112°35'39" to Gila River at 33°13'44"/112°46'15"											AgL
MG	Ash Creek	Headwaters to confluence with Tex Canyon at 34°34'44"/112°07'18"		A&Wc				FBC			FC	AgI	AgL
MG	Ash Creek	Below confluence with Tex Canyon to Agua Fria at 34°19'34"/112°04'30"			A&Ww			FBC			FC	AgI	AgL
MG	Beehive Tank	32°52'36"/111°02'19"			A&Ww			FBC			FC		AgL
MG	Big Bug Creek	Headwaters to confluence with Eugene Gulch at 34°27'11"/112°18'28.5"		A&Wc				FBC			FC	AgI	AgL
MG	Big Bug Creek	Below confluence with Eugene Gulch to confluence with Agua Fria River at 34°18'54"/112°03'58"			A&Ww			FBC			FC	AgI	AgL
MG	Black Canyon Creek	Tributary to the Agua Fria River at 34°04'12"/112°09'29"			A&Ww			FBC			FC		AgL
MG	Blind Indian Creek	Tributary to the Hassayampa River at 34°12'40"/112°32'17"			A&Ww			FBC			FC		AgL
MG	Bonsall Park Lake	Municipal Park Lake; 59th Avenue & Bethany Home Road, Phoenix at 33°31'23"/112°11'05"	Urban		A&Ww				PBC		FC		
MG	Canal Park Lake	Municipal Park Lake; College Avenue & Curry Road, Tempe at 33°26'57"/111°56'14"	Urban		A&Ww				PBC		FC		
MG	Cave Creek	Headwaters to the Cave Creek Dam			A&Ww			FBC			FC		AgL
MG	Cave Creek	Cave Creek Dam to the Arizona Canal at 33°34'24"/112°06'25"				A&We			PBC				
MG	Centennial Wash	Tributary to the Gila River at 33°13'44"/112°46'16"				A&We			PBC				AgL
MG	Centennial Wash Ponds	33°55'10"/113°23'05"			A&Ww			FBC			FC		AgL
MG	Chaparral Park Lake	Municipal Park Lake; Hayden Road & Chaparral Road, Scottsdale at 33°30'41"/111°54'25"	Urban		A&Ww				PBC		FC	AgI	
MG	Cortez Park Lake	Municipal Park Lake; 35th Avenue & Dunlap, Glendale at 33°34'13"/112°07'51"	Urban		A&Ww				PBC		FC	AgI	
MG	Desert Breeze Lake	Municipal Park Lake; Galaxy Drive, West Chandler at 33°18'47.5"/111°55'08"	Urban		A&Ww				PBC		FC		
MG	Devils Canyon	Tributary to Mineral Creek at 33°12'58"/110°59'42"			A&Ww				FBC		FC		AgL
MG	Dobson Lake	Municipal Park Lake; Dobson Road & Los Lagos Vista Avenue, Mesa at 33°22'17"/111°53'12"	Urban		A&Ww				PBC		FC		

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Eldorado Park Lake	Municipal Park Lake; Miller Road & Oak Street, Tempe at 33°28'25"/111°54'51"	Urban		A&Ww				PBC		FC		
MG	Encanto Park Lake	Municipal Park Lake; 15th Avenue & Encanto Blvd., Phoenix at 33°28'36"/ 112°05'17"	Urban		A&Ww				PBC		FC	AgI	
MG	Fain Lake	~~Park Lake, city~~ City of Prescott Valley Park Lake 34°34'29"/112°21'03"	Urban		A&Ww				PBC		FC		
MG	French Gulch	Headwaters to confluence with Hassayampa River			A&Ww				PBC				AgL
MG	Galena Gulch	Tributary to the Agua Fria River at 34°28'37"/ 112°15'14"				A&We			PBC				AgL
MG	Gallaway Wash (EDW)	Town of Cave Creek WWTP outfall #2 at 33°49'58"/111°57'30" to confluence with Andorra Wash at 33°49'59"/111°57'41"					A&Wedw		PBC				
MG	Gila River	San Carlos Indian Reservation to the Ashurst-Hayden Dam at 33°06'01"/111°14'46"			A&Ww			FBC			FC	AgI	AgL
MG	Gila River	Ashurst-Hayden Dam to the Florence WWTP outfall at 33°02'30"/111°24'16"				A&We			PBC				AgL
MG	Gila River (EDW)	Florence WWTP outfall to Felix Road at 33°01'49"/111°17'16"					A&Wedw		PBC				
MG	Gila River	Felix Road to the Gila River Indian Reservation				A&We			PBC				AgL
MG	Gila River (EDW)	Salt River to the Gillespie Dam at 33°13'45"/ 112°46'07"					A&Wedw		PBC		FC	AgI	AgL
MG	Gila River	Gillespie Dam to Painted Rock Dam at 33°04'23"/113°00'40"			A&Ww			FBC			FC	AgI	AgL
MG	Granada Park Lake	Municipal Park Lake; 6505 North 20th Street, Phoenix at 33°31'58.6"/112°02'06"	Urban		A&Ww				PBC		FC		
MG	Groom Creek	Tributary to the Hassayampa River at 34°27'14"/112°29'24"		A&Wc				FBC		DWS	FC		AgL
MG	Hank Raymond Lake	33°50'18"/112°16'07"			A&Ww			FBC			FC	AgI	AgL
MG	Hassayampa Lake	34°25'45"/112°25'29"	Igneous	A&Wc				FBC		DWS	FC		
MG	Hassayampa River	Headwaters to confluence with unnamed tributary at 34°26'09"/112°30'32"		A&Wc				FBC			FC	AgI	AgL
MG	Hassayampa River	Below confluence with unnamed tributary to 8 miles south of Wickenberg			A&Ww			FBC			FC	AgI	AgL
MG	Hassayampa River	8 miles south of Wickenburg to the Buckeye Irrigation Company Canal at 33°23'38"/ 112°22'22.8"				A&We			PBC				AgL
MG	Hassayampa River	Buckeye Irrigation Company canal to the Gila River at 33°19'34"/112°42'39.6"			A&Ww			FBC			FC		AgL
MG	Horsethief Lake	34°09'42"/112°17'56"	Igneous	A&Wc				FBC		DWS	FC		AgL
MG	Indian Bend Wash	Tributary to the Salt River at 33°26'13"/ 111°54'58"				A&We			PBC				
MG	Indian Bend Wash Lakes	Municipal Park Lakes; Scottsdale at 33°30'31"/111°54'24"	Urban		A&Ww				PBC		FC		
MG	Indian School Park Lake	Municipal Park Lake; Indian School Road & Hayden Road, Scottsdale at 33°29'45"/ 111°54'33"	Urban		A&Ww				PBC		FC		
MG	Kiwanis Park Lake	Municipal Park Lake; 6000 South Mill Avenue, Tempe at 33°22'27"/111°56'21"	Urban		A&Ww				PBC		FC	AgI	
MG	Lake Pleasant	33°51'15"/112°16'15"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
MG	Lion Canyon	Tributary to Weaver Creek at 34°10'12"/ 112°41'49"			A&Ww			FBC			FC		AgL
MG	Little Ash Creek	Tributary to Ash Creek at 34°20'46"/ 112°04'16"			A&Ww			FBC			FC		AgL
MG	Lynx Creek	Headwaters to confluence with unnamed tributary at 34°34'29"/112°21'05"		A&Wc				FBC			FC		AgL
MG	Lynx Creek	Below confluence with unnamed tributary to Agua Fria River at 34°37'49"/112°14'42"			A&Ww			FBC			FC		AgL
MG	Lynx Lake	34°31'08"/112°23'05"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
MG	Maricopa Park Lake	33°35'30"/112°18'16"	Urban		A&Ww				PBC		FC		
MG	Martinez Canyon	Tributary to Box Canyon at 33°06'33"/ 111°12'48"			A&Ww			FBC			FC		AgL
MG	Martinez Creek	Tributary to the Hassayampa River at 33°59'56"/112°44'38"			A&Ww			FBC			FC	AgI	AgL
MG	McKellips Park Lake	Municipal Park Lake; Miller Road & McKellips Road, Scottsdale at 33°27'14"/111°54'45"	Urban		A&Ww				PBC		FC	AgI	
MG	McMicken Wash (EDW)	Jomax WWTP outfall at 33°43'30"/ 112°20'11" to confluence of McMicken Wash with Agua Fria River at 33°39'39"/112°18'56"					A&Wedw		PBC				
MG	Mineral Creek	Tributary to the Gila River at 34°17'42"/ 112°13'34"			A&Ww			FBC			FC		AgL
MG	Minnehaha Creek	Tributary to the Hassayampa River at 34°11'49"/112°32'24"			A&Ww			FBC			FC		AgL

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Mountain Valley Park Ponds (EDW)	Town of Prescott Valley WWTP outfall 002 at 34°26'07"/112°18'48" to Navajo Wash					A&Wedw		PBC				
MG	New River	Headwaters to I-17 at 33°54'19.5"/112°08'46"			A&Ww			FBC			FC	AgI	AgL
MG	New River	Below I-17 to Agua Fria River at 33°30'47"/112°18'14"				A&We			PBC				AgL
MG	Painted Rock Reservoir	33°04'15"/113°00'30"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
MG	Papago Park Ponds	Municipal Park Lake; Galvin Parkway, Phoenix at 33°26'56"/111°56'50"	Urban		A&Ww				PBC		FC		
MG	Papago Park South Pond	Municipal Park Lake; Curry Road, Tempe	Urban		A&Ww				PBC		FC		
MG	Perry Mesa Tank	34°11'03"/112°01'59"			A&Ww			FBC			FC		AgL
MG	Phoenix Area Canals	Granite Reef Dam to all municipal WTP intakes								DWS		AgI	AgL
MG	Phoenix Area Canals	Below municipal WTP intakes and all other locations										AgI	AgL
MG	Picacho Reservoir	32°51'17"/111°28'49"	Shallow		A&Ww			FBC			FC	AgI	AgL
MG	Poland Creek	Headwaters to confluence with Lorena Gulch at 34°12'32"/112°19'07"		A&Wc				FBC			FC		AgL
MG	Poland Creek	Below confluence with Lorena Gulch to Black Canyon Creek at 34°14'20"/112°12'54"			A&Ww			FBC			FC		AgL
MG	Queen Creek	Headwaters to the Town of Superior WWTP outfall at 33°16'45"/111°17'25"			A&Ww	~~A&We~~			PBC				AgL
MG	Queen Creek (EDW)	Town of Superior WWTP outfall to confluence with Potts Canyon at 33°17'17"/111°11'36"					A&Wedw		PBC				
MG	Queen Creek	Potts Canyon to Queen Valley golf course at 33°17'55"/111°17'17"			A&Ww			FBC			FC		AgL
MG	Queen Creek	Below Queen Valley golf course to Gila River at 33°09'50"/111°53'16.8"				A&We			PBC				
MG	Riverview Park Lake	Municipal Park Lake; Dobson Road & 8th Street, Mesa at 33°25'50"/111°52'29"	Urban		A&Ww				PBC		FC		
MG	Roadrunner Park Lake	Municipal Park Lake; 36th Street & Cactus, Phoenix at 33°35'57"/112°00'18"	Urban		A&Ww				PBC		FC		
MG	Salt River	Verde River to 2 km below Granite Reef Dam (Granite Reef Dam is at 31°26'23"/111°12'40")			A&Ww			FBC		DWS	FC	AgI	AgL
MG	Salt River	2 km below Granite Reef Dam to City of Mesa NW WRF outfall at 33°26'45"/111°56'35"				A&We			PBC				
MG	Salt River (EDW)	City of Mesa NW WRF outfall at 33°26'45"/111°56'35" to Tempe Town Lake at 33°26'01"/111°54'55"					A&Wedw		PBC				
MG	Salt River	Below Tempe Town Lake to I-10 bridge				A&We			PBC				
MG	Salt River	I-10 bridge to the 23rd Avenue WWTP at 33°25'03"/112°06'41.6"			A&Ww				PBC		FC		
MG	Salt River (EDW)	23rd Avenue WWTP to confluence with Gila River at 33°22'55"/112°18'21.6"					A&Wedw		PBC		FC	AgI	AgL
MG	Siphon Draw (EDW)	Superstition Mountains WWTP outfall at 33°21'40"/111°33'30" to 6 km downstream at 32°21'01"/111°36'59"					A&Wedw		PBC				
MG	Sycamore Creek	Headwaters to confluence with Tank Canyon at 34°19'32"/111°50'12"		A&Wc				FBC			FC		AgL
MG	Sycamore Creek	Below confluence with Tank Canyon to the Agua Fria River at 34°19'30"/112°04'12"			A&Ww			FBC			FC		AgL
MG	Tempe Town Lake	At Mill Avenue Bridge at 33°26'30"/111°53'30"	Urban		A&Ww			FBC			FC		
MG	Tule Creek	Tributary to the Agua Fria River at 33°57'25"/112°14'13"			A&Ww			FBC			FC		AgL
MG	Turkey Creek	Headwaters to confluence with unnamed tributary at 34°19'28"/112°21'28"		A&Wc				FBC			FC	AgI	AgL
MG	Turkey Creek	Below confluence with unnamed tributary to Poland Creek at 34°14'20"/112°12'54"			A&Ww			FBC			FC	AgI	AgL
MG	Unnamed Wash (EDW)	City of Phoenix Cave Creek WRF outfall at 33°45'20"/112°00'59" to unnamed wash to 0.5 km downstream at 33°35'07"/112°01'12"					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Gila Bend WWTP outfall to the Gila River at 32°58'13"/112°43'46"					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Luke Air Force Base WWTP outfall to the Agua Fria River at 33°32'21"/112°19'15"					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Florence Gardens WWTP outfall at 33°03'49.54"/111°23'13.28" to confluence with Gila River at 33°02'59"/111°23'15"					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Prescott Valley WWTP outfall to the Agua Fria River at 34°35'16"/112°16'18"					A&Wedw		PBC				

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Unnamed Wash (EDW)	Queen Valley Sanitary District WWTP outfall at 33°17'38"/111°18'31" to the confluence with Queen Creek					A&Wedw		PBC				
MG	Wagner Wash (EDW)	Buckeye Festival Ranch WRF outfall at 33°39'14"/112°40'18" to confluence with Hassayampa River at 33°35'19"/112°44'01"					A&Wedw		PBC				
MG	Vista Del Camino Park North	Municipal Park Lake; 7700 East Roosevelt Street, Scottsdale at 33°27'33"/111°54'49.3"			A&Ww				PBC		FC		
~~MG~~	~~Vista Del Camino Park South~~	~~Municipal Park Lake; 7700 East Roosevelt Street, Scottsdale~~			~~A&Ww~~				~~PBC~~		~~FC~~		
MG	Walnut Canyon Creek	Tributary to the Gila River at 33°06'47"/111°05'20"			A&Ww			FBC			FC		AgL
MG	Weaver Creek	Tributary to Martinez Creek at 34°03'18"/112°46'48"			A&Ww			FBC			FC		AgL
MG	White Canyon Creek	Tributary to Walnut Canyon Creek at 33°09'25"/111°04'48"			A&Ww			FBC			FC		AgL
~~RM~~	~~Abbot Canyon~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Ash Creek~~	~~Chiricahua Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~RM~~	~~Bear Creek~~	~~Headwaters to U.S./Mexico border at 31°19'59"/110°22'58.5"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Blackwater Draw~~	~~San Bernardino Valley~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Buck Canyon~~	~~Headwaters to Buck Creek Tank at 31°33'06"/109°52'43"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Buck Canyon~~	~~Below Buck Creek Tank~~				~~A&We~~			~~PBC~~				~~AgL~~
~~RM~~	~~California Gulch~~	~~South of Ruby~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Dixie Canyon~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Dry Canyon~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Gadwell Canyon~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Glance Creek~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Gold Gulch~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Holden Canyon Creek~~	~~Coronado National Forest~~			~~A&Ww~~			~~FBC~~			~~FC~~		
~~RM~~	~~Johnson Canyon~~	~~Chiricahua Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Leslie Canyon Creek~~	~~Chiricahua Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Mexican Canyon~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Mule Gulch~~	~~Headwaters to just above the Lavender Pit~~			~~A&Ww~~				~~PBC~~		~~FC~~		
~~RM~~	~~Mule Gulch~~	~~Just above the Lavender Pit to the Bisbee WWTP outfall~~				~~A&We~~			~~PBC~~				
~~RM~~	~~Mule Gulch (EDW)~~	~~Below the Bisbee WWTP outfall, to the Highway 80 bridge at 31°26'30"/109°49'28"~~					~~A&Wedw~~		~~PBC~~				
~~RM~~	~~Mule Gulch~~	~~Below the Highway 80 bridge~~				~~A&We~~			~~PBC~~				~~AgL~~
~~RM~~	~~Quitobaquito Spring~~	~~(Pond and Springs) 31°56'39"/113°01'06"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Ruby Lakes~~	~~Near the town of Ruby~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Rucker Canyon Creek~~	~~Chiricahua Mtns; tributary to Whitewater Draw at 31°44'46"/109°26'06"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Rucker Canyon Lake~~	~~31°46'46"/109°18'30"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Soto Canyon~~	~~Mule Mountains~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Sycamore Canyon Creek~~	~~Headwaters to the U.S./Mexico border at 31°22'48"/111°13'19"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~RM~~	~~Unnamed Wash (EDW)~~	~~Bisbee-Douglas International Airport WWTP outfall to Whitewater Draw~~					~~A&Wedw~~		~~PBC~~				
~~RM~~	~~Whitewater Draw~~	~~Headwaters to confluence with unnamed tributary at 31°20'36"/109°34'46"~~				~~A&We~~			~~PBC~~				~~AgL~~
~~RM~~	~~Whitewater Draw~~	~~Below confluence with unnamed tributary~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
SC	Agua Caliente Lake	Municipal Park Lake; 12325 East Roger Road, Tucson	Urban		A&Ww				PBC		FC		
SC	Agua Caliente Wash	Headwaters to Soldier Trail at 32°17'48"/110°42'58.5"			A&Ww			FBC			FC		AgL
SC	Agua Caliente Wash	Below Soldier Trail to Tanque Verde Creek at 32°14'35"/110°47'17"				A&We			PBC				AgL
SC	Aguirre Wash	Those reaches not located on the Tohono O'odham Indian Reservation				A&We			PBC				
SC	Alambre Wash	Tributary to Brawley Wash at 31°57'47"/111°23'28"				A&We			PBC				
SC	Alamo Wash	Tributary to Rillito Creek at 32°16'23"/110°54'18"				A&We			PBC				
SC	Altar Wash	Tributary to Brawley Wash at 31°57'47"/111°23'28"				A&We			PBC				
SC	Alum Gulch	Headwaters to 31°28'20"/110°43'51"				A&We			PBC				AgL
SC	Alum Gulch	From 31°28'20"/110°43'51" to 31°29'17"/110°44'25"			A&Ww			FBC			FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Alum Gulch	Below 31°29'17"/110°44'25" to Sonoita Creek at 31°30'58"/110°47'06"				A&We			PBC				AgL
SC	Arivaca Creek	Tributary to Altar Wash at 31°43'01"/111°25'41"			A&Ww			FBC			FC		AgL
SC	Arivaca Lake	31°31'50"/111°15'05"	Igneous		A&Ww			FBC			FC	AgI	AgL
SC	Atterbury Wash	Tributary to Pantano Wash at 32°10'52"/ 110°48'50"				A&We			PBC				AgL
SC	Bear Grass Tank	31°33'01"/111°11'32"			A&Ww			FBC			FC		AgL
SC	Big Wash	Tributary to Cañada del Oro at 32°24'47"/ 110°56'28"				A&We			PBC				
SC	Black Wash (EDW)	Pima County WWMD Avra Valley WWTP at 32°09'50"/111°10'49" to confluence with Brawley wash at 32°15'00"/111°14'34"					A&Wedw		PBC				
SC	Bog Hole Tank	31°28'34"/110°37'07"			A&Ww			FBC			FC		AgL
SC	Brawley Wash	Tributary to Los Robles Wash at 32°21'54"/ 111°17'31"				A&We			PBC				
SC	California Gulch	South of Ruby			A&Ww			FBC			FC		AgL
SC	Cañada del Oro	Headwaters to Highway 89 at 32°24'48"/ 110°56'14"			A&Ww			FBC			FC	AgI	AgL
SC	Cañada del Oro	Below Highway 89 to the Santa Cruz River at 32°19'30"/111°03'47"				A&We			PBC				AgL
SC	Cienega Creek	Headwaters to confluence with Gardner Canyon and Spring Water Canyon at ~~R18E, T17S.~~ 31°47'38"/110°35'17"			A&Ww			FBC			FC		AgL
SC	Cienega Creek ~~(Unique Water)~~ (OAW)	From confluence with Gardner Canyon and Spring Water Canyon ~~at R18E, T17S~~ to USGS gaging station at 32°02'09"/110°40'34" (becomes Pantano Wash below this point)			A&Ww			FBC			FC		AgL
SC	Davidson Canyon	Headwaters to unnamed spring at 31°59'00"/ 110°38'46"				A&We			PBC				AgL
SC	Davidson Canyon	Unnamed Spring to confluence with unnamed tributary at 31°59'32.5"/110°38'43.5"			A&Ww			FBC			FC		AgL
SC	Davidson Canyon	From confluence with unnamed tributary to unnamed spring at 32°00'54"/110°38'54"				A&We			PBC				AgL
SC	Davidson Canyon	From unnamed spring at 32°00'54"/ 110°38'54" to confluence with Cienega Creek at 32°01'05"/110°38'32"			A&Ww			FBC			FC		AgL
SC	Empire Gulch	Headwaters to unnamed spring at 31°47'14"/ 110°38'13"				A&We			PBC				
SC	Empire Gulch	From 31°47'14" / 110°38'13" to31°47'11" / 110°00'39"			A&Ww			FBC			FC		
SC	Empire Gulch	Below 31°47"11" / 110°00'39" to 31°47'18" / 110°36'57"				A&We			PBC				AgL
SC	Empire Gulch	From 31°47'18" / 110°36'57" to confluence with Cienega Creek at 31°48'32"/110°35'20"			A&Ww			FBC			FC		
SC	Flux Canyon	Tributary to Alum Canyon at 31°30'22"/ 110°46'41"				A&We			PBC				AgL
SC	Gardner Canyon Creek	Headwaters to confluence with Sawmill Canyon at 31°42'51"/110°44'43"		A&Wc				FBC			FC		
SC	Gardner Canyon Creek	Below Sawmill Canyon to Cienega Creek at 31°47'38"/110°35'17"			A&Ww			FBC			FC		
SC	Greene Wash	Tributary to the Santa Cruz River at 33°00'54"/111°59'46"				A&We			PBC				
SC	Harshaw Creek	Tributary to Sonoita Creek at 31°32'35"/ 110°44'42"				A&We			PBC				AgL
SC	Hit Tank	32°43'57"/111°03'18"			A&Ww			FBC			FC		AgL
SC	Holden Canyon Creek	Headwaters to Mexico border at 31°23'38"/ 111°15'54" in the Coronado National Forest			A&Ww			FBC			FC		
SC	Huachuca Tank	31°21'11"/110°30'12"			A&Ww			FBC			FC		AgL
SC	Julian Wash	Tributary to the Santa Cruz River at 32°11'20"/110°59'13"				A&We			PBC				
SC	Kennedy Lake	Municipal Park Lake; Mission Road & Ajo Road, Tucson at 32°10'48.5"/111°00'27"	Urban		A&Ww				PBC		FC		
SC	Lakeside Lake	Municipal Park Lake; 8300 East Stella Road, Tucson at 32°11'10.5"/110°49'00"	Urban		A&Ww				PBC		FC		
SC	Lemmon Canyon Creek	Headwaters to confluence with unnamed tributary at 32°23'47"/110°47'46"		A&Wc				FBC			FC		
SC	Lemmon Canyon Creek	Below unnamed tributary to Sabino Canyon Creek at 32°23'02"/110°47'28"			A&Ww			FBC			FC		
SC	Los Robles Wash	Tributary to the Santa Cruz River at 32°32'13"/111°23'53"				A&We			PBC				
SC	Madera Canyon Creek	Headwaters to confluence with unnamed tributary at 31°43'42"/110°52'50"		A&Wc				FBC			FC		AgL
SC	Madera Canyon Creek	Below unnamed tributary to the Santa Cruz River at 31°46'55"/111°00'58"			A&Ww			FBC			FC		AgL
SC	Mattie Canyon	Tributary to Cienega Creek at 31°51'31"/ 110°34'25"			A&Ww			FBC			FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Nogales Wash	Tributary to Potrero Creek at 31°24'07"/110°57'11"			A&Ww				PBC				
SC	Oak Tree Canyon	Tributary to Cienega Creek at 31°48'43"/110°35'24"				A&We			PBC				
SC	Palisade Canyon Creek	Headwaters to confluence with unnamed tributary at 32°22'34"/110°45'35"		A&Wc				FBC			FC		
SC	Palisade Canyon Creek	Below unnamed tributary to Sabino Canyon Creek at 32°21'54"/110°46'23"			A&Ww			FBC			FC		
SC	Pantano Wash	Tributary to Tanque Verde Creek at 32°16'23"/110°54'18"				A&We			PBC				
SC	Paradise Lake	32°44'18"/111°40'42"	Urban		A&Ww			~~FBC~~	PBC			AgI	
SC	Parker Canyon Creek	Headwaters to confluence with unnamed tributary at 31°24'17"/110°28'44.5"		A&Wc				FBC			FC		
SC	Parker Canyon Creek	Below unnamed tributary to Mexico border at 31°19'59"/110°33'58"			A&Ww			FBC			FC		
SC	Parker Canyon Lake	31°25'35"/110°27'15"	Deep	A&Wc				FBC			FC	AgI	AgL
SC	Patagonia Lake	31°29'30"/110°52'00"	Deep	~~A&Wc~~	A&Ww			FBC		~~DWS~~	FC	AgI	AgL
SC	Peña Blanca Lake	31°24'12"/111°05'04"	Igneous	~~A&Wc~~	A&Ww			FBC			FC	AgI	AgL
SC	Potrero Creek	Headwaters to Interstate 19 at 31°23'24"/110°57'30"				A&We			PBC				AgL
SC	Potrero Creek	Below Interstate 19 to Santa Cruz River at 31°27'07"/110°57'40"			A&Ww			FBC			FC		AgL
SC	Puertocito Wash	Tributary to Altar Wash at 31°43'01"/111°25'41"				A&We			PBC				
SC	Quitobaquito Spring	(Pond and Springs) 31°56'39"/113°01'06"			A&Ww			FBC			FC		AgL
SC	Redrock Canyon Creek	Tributary to Harshaw Creek at 31°32'35"/110°44'13"			A&Ww			FBC			FC		
SC	Rillito Creek	Tributary to the Santa Cruz River at 32°18'50"/111°03'18"				A&We			PBC				AgL
SC	Romero Canyon Creek	Headwaters to confluence with unnamed tributary at 32°24'30"/110°50'35"		A&Wc				FBC			FC		
SC	Romero Canyon Creek	Below unnamed tributary to Sutherland Wash at 32°25'52"/110°53'56"			A&Ww			FBC			FC		
SC	Rose Canyon Creek	Tributary to Rose Canyon Lake at 32°23'10"/110°43'01"		A&Wc				FBC			FC		
SC	Rose Canyon Lake	32°23'13"/110°42'38"	Igneous	A&Wc				FBC			FC		AgL
SC	Ruby Lakes	Near the town of Ruby at 31°26'28.5"/111°14'19"	Igneous		A&Ww			FBC			FC		AgL
SC	Sabino Canyon Creek	Headwaters to confluence with unnamed tributary at 32°23'28"/110°47'00"		A&Wc				FBC		DWS	FC	AgI	
SC	Sabino Canyon Creek	Below unnamed tributary to Tanque Verde River at 32°15'40"/110°49'30"			A&Ww			FBC		DWS	FC	AgI	
SC	Salero Ranch Tank	31°35'42"/110°53'22"			A&Ww			FBC			FC		AgL
SC	Santa Cruz River	Headwaters to the International Boundary at 31°19'58"/110°35'48"			A&Ww			FBC			FC	AgI	AgL
SC	Santa Cruz River	International Boundary to the Nogales International WWTP outfall at 31°27'24"/110°58'05"			A&Ww			FBC		DWS	FC	AgI	AgL
SC	Santa Cruz River (EDW)	Nogales International WWTP outfall to the Tubac Bridge at 31°36'25"/110°02'00"					A&Wedw		PBC				AgL
SC	Santa Cruz River	The Tubac Bridge to Roger Rd WWTP outfall				A&We			PBC				AgL
SC	Santa Cruz River (EDW)	Roger Road WWTP outfall to Baumgartner Road at 32°35'37"/111°28'08"					A&Wedw		PBC				
SC	Santa Cruz ~~River (Wash)~~ Wash	Baumgartner Road to the ~~Gila River~~ Ak Chin Indian Reservation				A&We			PBC				AgL
SC	Santa Cruz ~~River~~ Wash, West Branch	Tributary to the Santa Cruz ~~River~~ Wash at 32°12'07"/110°59'20"				A&We			PBC				AgL
SC	Santa Cruz ~~River~~ Wash, ~~N. Fork~~ North Branch	Tributary to the Santa Cruz ~~River~~ Wash at 32°55'55"/111°53'10"				A&We			PBC				
SC	Santa Cruz Wash, North Branch (EDW)	City of Casa Grande WRF outfall at 32°54'57"/111°47'13" to 1 km downstream at 32°54'49"/111°47'48"					A&Wedw		PBC				
SC	Santa Cruz Wash (EDW)	Palo Verde Utilities WWTP outfall at 33°04'20"/112°01'47" to the Gila River Indian Reservation					A&Wedw		PBC				
SC	Santa Rosa Wash	Below Tohono O'odham Indian Reservation to the ~~Santa Cruz Wash at 32°53'49"/111°56'46"~~ Ak Chin Indian Reservation				A&We			PBC				
SC	Soldier Lake	32°25'34"/110°44'41"		A&Wc				FBC			FC		AgL

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Sonoita Creek	Headwaters to the Town of Patagonia WWTP outfall at 31°32'15"/110°45'30"				A&We			PBC				AgL
SC	Sonoita Creek (EDW)	Town of Patagonia WWTP outfall to ~~750~~ permanent groundwater upwelling point approximately 1600 feet downstream of outfall					A&Wedw		PBC				AgL
SC	Sonoita Creek	Below ~~750~~ 1600 feet downstream of Town of Patagonia WWTP outfall to the Santa Cruz River at 31°29'43"/110°58'37"			A&Ww			FBC			FC	AgI	AgL
SC	Split Tank	31°28'15"/111°05'15"			A&Ww			FBC			FC		AgL
SC	Sutherland Wash	Tributary to Cañada del Oro at 32°25'05"/110°55'26"			A&Ww			FBC			FC		
SC	Sycamore Canyon	From 32°21'36" / 110°45'21" to Sycamore Reservoir			A&Ww			FBC			FC		
SC	Sycamore Canyon Creek	Headwaters to the U.S./Mexico border at 31°22'48"/111°13'19"			A&Ww			FBC			FC		AgL
SC	Sycamore Reservoir	32°20'57"/110°44'52"		A&Wc				FBC			FC		AgL
SC	Tanque Verde Creek	Headwaters to Houghton Road at 32°14'13"/110°46'04"			A&Ww			FBC			FC		AgL
SC	Tanque Verde Creek	Below Houghton Road to Rillito Creek at 32°16'08"/110°52'30"				A&We			PBC				AgL
SC	The Lake Tank	32°54'14"/111°04'14"			A&Ww			FBC			FC		AgL
SC	Three R Canyon	Headwaters to ~~Lat/Long:~~ 31°28'35"/110°46'19"				A&We			PBC				AgL
SC	Three R Canyon	From ~~Lat/Long:~~ 31°28'35"/110°46'19" to ~~Lat/Long:~~ 31°28'27"/110°47'12"			A&Ww			FBC			FC		AgL
SC	Three R Canyon	From ~~Lat/Long:~~ 31°28'27"/110°47'12" to Sonoita Creek at 31°29'56"/110°48'54"				A&We			PBC				AgL
SC	Tinaja Wash	~~Eastern foothills, Sierrita Mountains~~ Headwaters to the Santa Cruz River at 31°32'58.4"/111°02'45.7"				A&We			PBC				AgL
SC	Unnamed Wash (EDW)	Oracle Sanitary District WWTP outfall at 32°36'54"/110°48'02" to 5 km downstream					A&Wedw		PBC				
SC	Unnamed Wash	5 km downstream of the Oracle Sanitary District WWTP outfall				A&We			PBC				
SC	Unnamed Wash (EDW)	Arizona City Sanitary District WWTP outfall at 32°45'47"/111°44'20" to confluence with Santa Cruz Wash at 35°45'45"/111°46'43"					A&Wedw		PBC				
SC	Unnamed Wash (EDW)	Saddlebrook WWTP outfall at 32°32'00"/110°52'59" to confluence with Cañada del Oro at 32°30'20"/110°52'27"					A&Wedw		PBC				
SC	Vekol Wash	Those reaches not located on the Ak-Chin, Tohono O'odham and Gila River Indian Reservations				A&We			PBC				
SC	Wakefield Canyon	Headwaters to confluence with unnamed tributary 31°52'47"/110°26'25"		A&Wc				FBC			FC		AgL
SC	Wakefield Canyon	Below confluence with unnamed tributary to Cienega Creek at 31°52'47.5"/110°26'25"			A&Ww			FBC			FC		AgL
SC	Wild Burro Canyon	Headwaters to confluence with unnamed tributary at 32°28'36"/111°05'18"			A&Ww			FBC			FC		AgL
SC	Wild Burro Canyon	Below confluence with unnamed tributary to Santa Cruz River at 32°28'34"/111°05'15.5"				A&We			PBC				AgL
SC	Williams Ranch Tanks	31°55'15"/110°25'30"			A&Ww			FBC			FC		AgL
SP	Abbot Canyon	Headwaters to confluence with Whitewater Draw at 31°33'32"/109°48'39.6"			A&Ww			FBC			FC		AgL
SP	Aravaipa Creek	Headwaters to confluence with Stowe Gulch at 32°52'10"/110°22'00"			A&Ww			FBC			FC		AgL
SP	Aravaipa Creek ~~(Unique Water)~~ (OAW)	Stowe Gulch confluence to downstream boundary of Aravaipa Canyon Wilderness Area at 32°54'23"/110°33'40"			A&Ww			FBC			FC		AgL
SP	Aravaipa Creek	Below downstream boundary of Aravaipa Canyon Wilderness Area to the San Pedro River at 32°50'20"/110°42'50"			A&Ww			FBC			FC		AgL
SP	Ash Creek	Chiricahua Mountains, near Whitewater Draw at 31°50'28"/109°40'01.2"			A&Ww			FBC			FC	AgI	AgL
SP	Babocomari ~~Creek~~ River	Tributary to the San Pedro River at 31°43'19"/110°11'35"			A&Ww			FBC			FC		AgL
SP	Bass Canyon Creek	Headwaters to confluence with unnamed tributary at 32°26'06"/110°13'18"		A&Wc				FBC			FC		AgL
SP	Bass Canyon Creek	Below confluence with unnamed tributary to Hot Springs Canyon Creek at 32°20'53"/110°15'14"			A&Ww			FBC			FC		AgL
SP	Bass Canyon Tank	32°24'00"/110°13'00"			A&Ww			FBC			FC		AgL
SP	Bear Creek	Headwaters to U.S./Mexico border at 31°19'59"/110°22'58.5"			A&Ww			FBC			FC		AgL
SP	Big Creek	Tributary to Pitchfork Canyon at 32°35'24"/109°57'07"		A&Wc				FBC			FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SP	Blacktail Pond	Fort Huachuca Military Reservation at 31°24'13"/110°17'21"			A&Ww			FBC			FC		
SP	Blackwater Draw	Headwaters to the US/Mexico border at 31°20'02"/109°15'36" in the San Bernardino Valley			A&Ww			FBC			FC		AgL
SP	Booger Canyon Creek	Tributary to Aravaipa Creek at 32°54'54"/110°29'35"			A&Ww			FBC			FC		AgL
SP	Buck Canyon	Headwaters to Buck Creek Tank at 31°33'06"/109°52'43"			A&Ww			FBC			FC		AgL
SP	Buck Canyon	Below Buck Creek Tank to Dry Creek at 31°31'08"/109°18'25"				A&We			PBC				AgL
SP	Buehman Canyon Creek ~~(Unique Water)~~ (OAW)	Headwaters to confluence with unnamed tributary at 32°24'31.5"/110°32'08"			A&Ww			FBC			FC		AgL
SP	Buehman Canyon Creek	Below confluence with unnamed tributary at 32°25'41"/110°29'53"			A&Ww			FBC			FC		AgL
SP	Bull Tank	32°31'15"/110°12'45"			A&Ww			FBC			FC		AgL
SP	Bullock Canyon	Tributary to Buehman Canyon at 32°23'00"/110°33'04"			A&Ww			FBC			FC		AgL
SP	Carr Canyon Creek	Headwaters to confluence with unnamed tributary at 31°27'00"/110°15'45"		A&Wc				FBC			FC		AgL
SP	Carr Canyon Creek	Below confluence with unnamed tributary to the San Pedro River at 31°30'32"/110°07'37"			A&Ww			FBC			FC		AgL
SP	Copper Creek	Headwaters to confluence with Prospect Canyon at 32°44'48"/110°30'18"			A&Ww			FBC			FC		AgL
SP	Copper Creek	Below confluence with Prospect Canyon to the San Pedro River at 32°41'17"/110°36'43"				A&We			PBC				AgL
SP	Deer Creek	Headwaters to confluence with unnamed tributary at 32°59'56"/110°20'09"		A&Wc				FBC			FC		AgL
SP	Deer Creek	Below confluence with unnamed tributary to Aravaipa Creek at 32°54'25"/110°28'01"			A&Ww			FBC			FC		AgL
SP	Dixie Canyon	Headwaters to Mexican Canyon at 31°29'02"/109°45'04" in the Mule Mountains			A&Ww			FBC			FC		AgL
SP	Double R Canyon Creek	Tributary to Bass Canyon at 32°21'06"/110°14'23"			A&Ww			FBC			FC		
SP	Dry Canyon	Headwaters to Abbot Canyon at 31°33'25"/109°43'23" in the Mule Mountains			A&Ww			FBC			FC		AgL
SP	East Gravel Pit Pond	Fort Huachuca Military Reservation at 31°30'54"/110°19'42"	Sedimentary		A&Ww			FBC			FC		
SP	Espiritu Canyon Creek	Tributary to Soza Wash at 32°18'52"/110°28'35"			A&Ww			FBC			FC		AgL
SP	Fly Pond	Fort Huachuca Military Reservation at 31°32'53"/110°21'14"			A&Ww			FBC			FC		
SP	Fourmile Canyon Creek	Tributary to Aravaipa Creek at 32°50'14"/110°20'08"			A&Ww			FBC			FC		AgL
SP	Fourmile Canyon, Left Prong	Headwaters to confluence with unnamed tributary at 32°43'14"/110°23'43"		A&Wc				FBC			FC		AgL
SP	Fourmile Canyon, Left Prong	Below confluence with unnamed tributary to Fourmile Canyon Creek at 32°47'33"/110°22'36"			A&Ww			FBC			FC		AgL
SP	Fourmile Canyon, Right Prong	Tributary to Fourmile Canyon at 32°47'33"/110°22'36"			A&Ww			FBC			FC		AgL
SP	Gadwell Canyon	Headwaters to Whitewater Draw at 31°36'50"/109°43'41" in the Mule Mountains			A&Ww			FBC			FC		AgL
SP	Garden Canyon Creek	Headwaters to confluence with unnamed tributary at 31°29'00"/110°19'42"		A&Wc				FBC		DWS	FC	AgI	
SP	Garden Canyon Creek	Below confluence with unnamed tributary to the San Pedro River at 31°41'46"/110°12'40"			A&Ww			FBC		DWS	FC	AgI	
SP	Glance Creek	Headwaters to Whitewater Draw at 31°27'04"/109°42'29" in the Mule Mountains			A&Ww			FBC			FC		AgL
SP	Gold Gulch	Headwaters to US/Mexico border at 31°20'10"/109°50'06" in the Mule Mountains			A&Ww			FBC			FC		AgL
SP	Golf Course Pond	Fort Huachuca Military Reservation at 31°32'14"/110°18'49"	Sedimentary		A&Ww			~~FBC~~	PBC		FC		
SP	Goudy Canyon Creek	Headwaers to Grant Creek at 32°35'13"/109°58'37" in the Pinaleno Mountains		A&Wc				FBC			FC		AgL
SP	Grant Creek	Headwaters to confluence with unnamed tributary at 32°38'09.5"/109°56'35"		A&Wc				FBC		DWS	FC		AgL
SP	Grant Creek	Below confluence with unnamed tributary to terminus near Willcox Playa at 32°33'43"/109°58'55"			A&Ww			FBC			FC		AgL
SP	Gravel Pit Pond	Fort Huachuca Military Reservation at 31°30'51"/110°19'47.6"	Sedimentary		A&Ww			FBC			FC		
SP	Greenbrush Draw	From Mexican border to confluence with San Pedro River				A&We			PBC				
SP	Hidden Pond	Fort Huachuca Military Reservation at 32°30'30"/109°22'17"			A&Ww			FBC			FC		

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SP	High Creek	Headwaters to confluence with unnamed tributary at 32°33'07"/110°14'40"		A&Wc				FBC			FC		AgL
SP	High Creek	Below confluence with unnamed tributary to terminus near Willcox Playa at 32°31'41"/109°02'38"			A&Ww			FBC			FC		AgL
SP	Horse Camp Canyon Creek	Tributary to Aravaipa Creek at 32°55'07"/110°30'56"			A&Ww			FBC			FC		AgL
SP	Hot Springs Canyon Creek	Tributary to the San Pedro River at 32°17'24"/110°22'55"			A&Ww			FBC			FC		AgL
SP	Johnson Canyon	Headwaters to Whitewater Draw at 31°32'56"/109°46'19" in the Chiricahua Mountains			A&Ww			FBC			FC		AgL
SP	Lake Cochise (EDW)	South of Twin Lakes Municipal Golf Course at 32°13"58"/109°49'25"					A&Wedw		PBC				
SP	Leslie Canyon Creek	Headwaters to Whitewater Draw at 31°32'10"/109°40'12" in the Chiricahua Mountains			A&Ww			FBC			FC		AgL
SP	Lower Garden Canyon Pond	Fort Huachuca Military Reservation			A&Ww			FBC			FC		
SP	Mexican Canyon	Headwaters to Whitewater Draw at 31°29'13"/109°46'30" in the Mule Mountains			A&Ww			FBC			FC		AgL
SP	Miller Canyon Creek	Headwaters to Broken Arrow Ranch Road at 31°25'33"/110°15'08"		A&Wc				FBC		DWS	FC		AgL
SP	Miller Canyon Creek	Below Broken Arrow Ranch Road to the San Pedro River at 31°29'56"/110°07'37"			A&Ww			FBC		DWS	FC		AgL
SP	Moonshine Creek	Tributary to Post Creek at 32°40'52"/109°54'25"		A&Wc				FBC			FC		AgL
SP	Mule Gulch	Headwaters to just above the Lavender Pit at 31°26'23.7"/109°45'36.7"			A&Ww				PBC		FC		
SP	Mule Gulch	Just above the Lavender Pit to the Bisbee WWTP outfall at 31°25'30"/109°52'40"				A&We			PBC				
SP	Mule Gulch (EDW)	Below the Bisbee WWTP outfall to the Highway 80 bridge at 31°26'30"/109°49'28"					A&Wedw		PBC				
SP	Mule Gulch	Below the Highway 80 bridge to Whitewater Draw at 31°28'03"/109°42'21"				A&We			PBC				AgL
SP	Oak Grove Creek	Tributary to Turkey Creek at 32°45'32"/110°14'06"			A&Ww			FBC			FC		AgL
SP	Officers Club Pond	Fort Huachuca Military Reservation at 31°32'51"/110°21'35"	Sedimentary		A&Ww			~~FBC~~	PBC		FC		
SP	Paige Canyon Creek	Tributary to the San Pedro River at 32°17'10"/110°22'48"			A&Ww			FBC			FC		AgL
SP	Parsons Canyon Creek	Tributary to Aravaipa Creek at 32°54'11"/110°27'40"			A&Ww			FBC			FC		AgL
SP	Pinery Creek	Headwaters to State Highway 181 at 32°00'24"/109°25'16"		A&Wc				FBC		DWS	FC		AgL
SP	Pinery Creek	Below State Highway 181 to terminus near Willcox Playa at 32°01'05"/109°34'23"			A&Ww			FBC		DWS	FC		AgL
SP	Post Creek	Tributary to Grant Creek at 32°40'05"/109°54'58"		A&Wc				FBC			FC	AgI	AgL
SP	Ramsey Canyon Creek	Headwaters to Forest Service Road #110 at 31°27'44"/110°17'27"		A&Wc				FBC			FC	AgI	AgL
SP	Ramsey Canyon Creek	Below Forest Service Road #110 to Carr Wash at 31°30'04"/110°09'11"			A&Ww			FBC			FC	AgI	AgL
SP	Rattlesnake Canyon	Headwaters to confluence with Brush Canyon at 32°38'27"/110°21'24"		A&Wc				FBC			FC		AgL
SP	Rattlesnake Canyon	Below confluence with Brush Canyon to Aravaipa Creek at 32°48'00"/110°17'32"			A&Ww			FBC			FC		AgL
SP	Redfield Canyon Creek	Headwaters to confluence with unnamed tributary at 32°33'39"/110°18'41"		A&Wc				FBC			FC		AgL
SP	Redfield Canyon Creek	Below confluence with unnamed tributary to the San Pedro River at 32°09'32"/110°17'56"			A&Ww			FBC			FC		AgL
SP	Riggs Flat Lake	32°42'27"/109°57'51"	Igneous	A&Wc				FBC			FC	AgI	AgL
SP	Rock Creek	Tributary to Turkey Creek at 31°53'20"/109°30'00" Alc						FBC			FC		AgL
SP	Rucker Canyon Creek	Headwaters to Whitewater Draw at 31°44'46"/109°26'06"	Igneous	A&Wc				FBC			FC		AgL
SP	Rucker Canyon Lake	31°46'46"/109°18'30"	Shallow	A&Wc				FBC			FC		AgL
SP	San Pedro River	U.S./ Mexico Border to Redington at 32°25'39"/110°29'33"			A&Ww			FBC			FC	AgI	AgL
SP	San Pedro River	Redington to the Gila River at 32°59'02"/110°46'55"			A&Ww			FBC			FC		AgL
SP	Snow Flat Lake	32°39'09"/109°51'52"	Igneous	A&Wc				FBC			FC	AgI	AgL
SP	Soldier Creek	Tributary to Post Creek at 32°40'52"/109°54'40"		A&Wc				FBC			FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SP	Soldier Creek (EDW)	Fort Huachuca WWTP outfall to unnamed wash at 31°34'48"/110°18'35" to confluence with Soldier Creek to confluence with Babocomari River at 31°39'46"/110°17'24"					A&Wedw		PBC				
SP	Soto Canyon	Headwaters to Dixie Canyon at 31°29'46"/109°55'37" in the Mule Mountains			A&Ww			FBC			FC		AgL
SP	Swamp Springs Canyon Creek	Tributary to Redfield Canyon at 32°26'10"/110°19'30"			A&Ww			FBC			FC		AgL
SP	Sycamore Pond I	Fort Huachuca Military Reservation at 31°35'12"/110°26'09"	Sedimentary		A&Ww			FBC			FC		
SP	Sycamore Pond II	Fort Huachuca Military Reservation at 31°34'38.6"/110°26'07"	Sedimentary		A&Ww			FBC			FC		
SP	Turkey Creek	Tributary to Aravaipa Creek at 32°53'49"/110°26'35"			A&Ww			FBC			FC		AgL
SP	Turkey Creek	Headwaters to confluence with Rock Creek at 31°53'20"/109°30'00"		A&Wc				FBC			FC	AgI	AgL
SP	Turkey Creek	Below confluence with Rock Creek to terminus near Willcox Playa at 31°59'56"/109°49'01"			A&Ww			FBC			FC	AgI	AgL
SP	Unnamed Wash (EDW)	Mt. Lemmon WWTP outfall to 0.25 km downstream					A&Wedw		PBC				
SP	Virgus Canyon Creek	Tributary to Aravaipa Creek at 32°54'58"/110°31'16"			A&Ww			FBC			FC		AgL
SP	Walnut Gulch	Headwaters to Tombstone WWTP outfall at 31°43'47"/110°04'06"				A&We			PBC				
SP	Walnut Gulch (EDW)	Tombstone WWTP outfall to the confluence of Tombstone Wash at 31°44'02"/110°05'58"					A&Wedw		PBC				
SP	Walnut Gulch	Tombstone Wash to San Pedro River at 31°43'19"/110°11'35"				A&We			PBC				
SP	Ward Canyon Creek	Tributary to Turkey Creek at 31°51'47"/109°20'13"		A&Wc				FBC			FC		AgL
SP	Whitewater Draw	Headwaters to confluence with unnamed tributary at 31°20'36"/109°34'46"				A&We			PBC				AgL
SP	Whitewater Draw	Below confluence with unnamed tributary to US/Mexico border at 31°20'02"/109°34'44"			A&Ww			FBC			FC		AgL
SP	Willcox Playa	32°08'19"/109°50'59" in the Sulphur Springs Valley	Sedimentary		A&Ww			FBC			FC		AgL
SP	Woodcutters Pond	Fort Huachuca Military Reservation at 31°31'11.5"/110°20'15"	Igneous		A&Ww			FBC			FC		
SR	Ackre (Judge) Lake	33°37'00"/109°20'37"		A&Wc				FBC			FC	AgI	AgL
SR	Apache Lake	33°35'30"/111°20'30"	Deep	~~A&We~~	A&Ww			FBC		DWS	FC	AgI	AgL
SR	Barnhardt Creek	Headwaters to confluence with unnamed tributary at 34°05'36"/111°26'38"		A&Wc				FBC			FC		AgL
SR	Barnhardt Creek	Below confluence with unnamed tributary to Rye Creek at 34°06'58"/111°21'32"			A&Ww			FBC			FC		AgL
SR	Basin Lake	33°55'00"/109°26'05"	Igneous		A&Ww			FBC			FC		AgL
SR	Bear Creek	Tributary to the Black River at 33°43'26"/109°22'30"		A&Wc				FBC			FC	AgI	AgL
SR	Bear Wallow Creek ~~(UW)~~ (OAW)	Tributary to the Black River at 33°37'44"/109°31'23"		A&Wc				FBC			FC		AgL
SR	Bear Wallow Creek, North Fork ~~(UW)~~ (OAW)	Tributary to Bear Wallow Creek at 33°35'53"/109°26'49"		A&Wc				FBC			FC		AgL
SR	Bear Wallow Creek, South Fork ~~(UW)~~ (OAW)	Tributary to Bear Wallow Creek at 33°35'53"/109°26'49"		A&Wc				FBC			FC		AgL
SR	Beaver Creek	Tributary to the Black River at 33°43'44"/109°21'07"		A&Wc				FBC			FC	AgI	AgL
SR	Big Lake	33°52'45"/109°25'00"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River	Tributary to the Salt River at 33°44'20"/110°13'30"		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, East Fork	Tributary to the Black River at 33°45'07"/109°21'43"		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, ~~N~~ North Fork of ~~E~~ East Fork	Tributary to Black River, East Fork at 33°56'17"/109°24'11"		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, West Fork	Tributary to the Black River at 33°45'07"/109°21'43"		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Bloody Tanks Wash	Headwaters to Schultze Ranch at 33°22'29"/110°54'39"				A&We			PBC				AgL
SR	Bloody Tanks Wash	Schultze Ranch to Miami Wash at 33°25'05"/110°50'02"				A&We			PBC				
SR	Boggy Creek	Tributary to the Black River at 33°44'31"/109°26'20"		A&Wc				FBC			FC	AgI	AgL

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SR	Boneyard Creek	Tributary to Black River, East Fork at 33°51'22"/109°18'50"		A&Wc				FBC			FC	AgI	AgL
SR	Boulder Creek	Tributary to LaBarge Creek at 33°30'54"/111°24'40"			A&Ww			FBC			FC		
SR	Campaign Creek	Tributary to Roosevelt Lake at 33°37'30"/111°00'04"			A&Ww			FBC			FC		AgL
SR	Canyon Creek	Headwaters to the White Mountain Apache Reservation at 33°57'53"/110°47'00"		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Canyon Lake	33°33'15"/111°26'30"	Deep	~~A&We~~	A&Ww			FBC		DWS	FC	AgI	AgL
SR	Centerfire Creek	Tributary to the Black River at 33°42'47"/109°26'17"		A&Wc				FBC			FC	AgI	AgL
SR	Chambers Draw Creek	Tributary to North Fork of the East Fork of Black River~~, N Fork of E Fork~~ at 33°53'03"/109°20'13"		A&Wc				FBC			FC		AgL
SR	Cherry Creek	Headwaters to confluence with unnamed tributary at 34°05'09"/110°56'04"		A&Wc				FBC			FC	AgI	AgL
SR	Cherry Creek	Below unnamed tributary to the Salt River at 33°40'16"/110°48'03.6"			A&Ww			FBC			FC	AgI	AgL
SR	Christopher Creek	Tributary to Tonto Creek at 34°18'36"/111°04'23"		A&Wc				FBC			FC	AgI	AgL
SR	Cold Spring Canyon Creek	Headwaters to confluence with unnamed tributary at 33°49'50"/110°52'55"		A&Wc				FBC			FC		AgL
SR	Cold Spring Canyon Creek	Below confluence with unnamed tributary to Cherry Creek at 33°50'06"/110°51'28.8"			A&Ww			FBC			FC		AgL
SR	Conklin Creek	Tributary to the Black River at 33°41'49"/109°27'36"		A&Wc				FBC			FC	AgI	AgL
SR	Coon Creek	Headwaters to confluence with unnamed tributary at 33°46'42"/110°54'25"		A&Wc				FBC			FC		AgL
SR	Coon Creek	Below confluence with unnamed tributary to the Salt River at 33°39'47"/110°50'24"			A&Ww			FBC			FC		AgL
SR	Corduroy Creek	Tributary to Fish Creek at 33°59'46"/110°17'31"		A&Wc				FBC			FC	AgI	AgL
SR	Coyote Creek	Tributary to the Black River, East Fork at 33°50'53"/109°18'18"		A&Wc				FBC			FC	AgI	AgL
SR	Crescent Lake	33°54'36"/109°25'08"	Shallow	A&Wc				FBC			FC	AgI	AgL
SR	Deer Creek	Tributary to the Black River, East Fork at 33°48'07"/109°19'26"		A&Wc				FBC			FC		AgL
SR	Del Shay Creek	Tributary to Gun Creek at 34°00'22"/111°15'43"			A&Ww			FBC			FC		AgL
SR	Devils Chasm Creek	Headwaters to confluence with unnamed tributary at 33°48'46"/110°52'33"		A&Wc				FBC			FC		AgL
SR	Devils Chasm Creek	Below confluence with unnamed tributary to Cherry Creek at 33°49'34"/110°54'18"			A&Ww			FBC			FC		AgL
SR	Dipping Vat Reservoir	33°55'54"/109°25'15"	Igneous		A&Ww			FBC			FC		AgL
SR	Double Cienega Creek	Tributary to Fish Creek at 33°38'35"/109°22'08"		A&Wc				FBC			FC		AgL
SR	Fish Creek	Tributary to the Black River at 33°42'40"/109°26'31"		A&Wc				FBC			FC	AgI	AgL
SR	Fish Creek	Tributary to the Salt River at 33°34'37"/111°21'11"			A&Ww			FBC			FC		
SR	Gold Creek	Headwaters to confluence with unnamed tributary at 33°59'47"/111°25'07"		A&Wc				FBC			FC		AgL
SR	Gold Creek	Below confluence with unnamed tributary to Tonto Creek at 33°58'55"/111°18'03.6"			A&Ww			FBC			FC		AgL
SR	Gordon Canyon Creek	Headwaters to confluence with Hog Canyon at 34°13'49"/111°00'27"		A&Wc				FBC			FC		AgL
SR	Gordon Canyon Creek	Below confluence with Hog Canyon to Haigler Creek at 34°11'56"/111°03'21"			A&Ww			FBC			FC		AgL
SR	Greenback Creek	Tributary to Tonto Creek at 33°47'38"/111°15'22"			A&Ww			FBC			FC		AgL
SR	Haigler Creek	Headwaters to confluence with unnamed tributary at 34°12'23.5"/111°00'11"		A&Wc				FBC			FC	AgI	AgL
SR	Haigler Creek	Below confluence with unnamed tributary to Tonto Creek at 34°12'54"/111°05'45.6"			A&Ww			FBC			FC	AgI	AgL
SR	Hannagan Creek	Tributary to Beaver Creek at 33°42'07"/109°14'46"		A&Wc				FBC			FC		AgL
SR	Hay Creek ~~(UW)~~ (OAW)	Tributary to the Black River, West Fork at 33°48'32"/109°25'16"		A&Wc				FBC			FC		AgL
SR	Home Creek	Tributary to the Black River, West Fork at 33°45'43"/109°22'48"		A&Wc				FBC			FC		AgL
SR	Horse Creek	Tributary to the Black River, West Fork at 33°45'11"/109°21'50"		A&Wc				FBC			FC		AgL
SR	Horse Camp Creek	Headwaters to confluence with unnamed tributary at 33°53'53"/110°50'10"		A&Wc				FBC			FC		AgL
SR	Horse Camp Creek	Below confluence with unnamed tributary to Cherry Creek at 33°52'08"/110°52'33.6"			A&Ww			FBC			FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SR	Horton Creek	Tributary to Tonto Creek at 34°20'24"/ 111°05'42"		A&Wc				FBC			FC	AgI	AgL
SR	Houston Creek	Tributary to Tonto Creek at 34°07'30"/ 111°15'25"			A&Ww			FBC			FC		AgL
SR	Hunter Creek	Tributary to Christopher Creek at 34°18'29"/ 111°01'55"		A&Wc				FBC			FC		AgL
SR	LaBarge Creek	~~Superstition Wilderness Area; tributary~~ Headwaters to Canyon Lake at 33°31'34"/ 111°25'15.6"			A&Ww			FBC			FC		
SR	Lake Sierra Blanca	33°52'25"/109°16'05"		A&Wc				FBC			FC	AgI	AgL
SR	Miami Wash	Tributary to Pinal Creek at 33°27'04"/ 110°50'17"				A&We			PBC				
SR	Mule Creek	Tributary to Canyon Creek at 34°16'34"/ 110°48'00"		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Open Draw Creek	Tributary to the East Fork of Black River~~, East Fork~~ at 33°49'52"/109°18'18"		A&Wc				FBC			FC		AgL
SR	P B Creek	Headwaters to Forest Service Road #203 at 33°57'08"/110°56'09"		A&Wc				FBC			FC		AgL
SR	P B Creek	Below Forest Service Road #203 to Cherry Creek at 33°55'34"/110°54'18"			A&Ww			FBC			FC		AgL
SR	Pinal Creek	Headwaters to confluence with unnamed EDW wash (Globe WWTP) at 33°25'29"/ 110°48'18"				A&We			PBC				AgL
SR	Pinal Creek (EDW)	~~Below unnamed EDW wash to Radium~~ Globe WWTP outfall on unnamed wash at 33°25'46"/110°47'28" to confluence with Pinal Creek to Radium at 33°26'54"/ 110°49'02"					A&Wedw		PBC				
SR	Pinal Creek	Radium to ~~Setka Ranch~~ lower Pinal Creek water treatment plant discharge at 33°32'05"/ 110°52'17"				A&We			PBC				AgL
SR	Pinal Creek	~~Setka Ranch to Salt River~~ Lower Pinal Creek WTP outfall #1 at 33°31'56"/110°52'14" to See Ranch Crossing at 33°32'25"/110°52'28"			~~A&Ww~~		A&Wedw	~~FBC~~	PBC		~~FC~~		~~AgL~~
SR	Pinal Creek	See Ranch Crossing to 33°35'33"/110°54'33"			A&Ww			FBC					
SR	Pinal Creek	From 33°35'33"/110°54'33" to Salt River			A&Ww			FBC			FC		
SR	Pine Creek	Tributary to the Salt River at 33°36'04"/ 111°12'36"			A&Ww			FBC			FC		
SR	Pinto Creek	Headwaters to confluence with unnamed tributary at 33°19'27"/110°54'56"		A&Wc				FBC			FC	AgI	AgL
SR	Pinto Creek	Below confluence with unnamed tributary to Roosevelt Lake at 33°39'11"/111°00'43"			A&Ww			FBC			FC	AgI	AgL
SR	Pueblo Canyon Creek	Headwaters to confluence with unnamed tributary at 33°50'30"/110°53'13"		A&Wc				FBC			FC		AgL
SR	Pueblo Canyon Creek	Below confluence with unnamed tributary to Cherry Creek at 33°52'30"/110°52'55"			A&Ww			FBC			FC		AgL
SR	Reevis Creek	Tributary to Pine Creek at 33°33'07"/ 111°09'40"			A&Ww			FBC			FC		
SR	Reservation Creek	Tributary to the Black River at 33°41'42"/ 109°28'26"		A&Wc				FBC			FC		AgL
SR	Reynolds Creek	Tributary to Workman Creek at 33°52'16"/ 111°00'14"		A&Wc				FBC			FC		AgL
SR	Roosevelt Lake	33°40'45"/111°09'15"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
SR	Russell Gulch	From headwaters to confluence with Miami Wash				A&We			PBC				
SR	Rye Creek	Tributary to Tonto Creek at 34°01'41"/ 111°17'06"			A&Ww			FBC			FC		AgL
SR	Saguaro Lake	33°34'00"/111°32'06"	Deep	~~A&Wc~~	A&Ww			FBC		DWS	FC	AgI	AgL
SR	Salome Creek	Tributary to the Salt River at 33°41'56"/ 111°05'46"			A&Ww			FBC			FC	AgI	AgL
SR	Salt River	~~Above Roosevelt Lake~~ Confluence of White River and Black River to Roosevelt Lake			A&Ww			FBC			FC	AgI	AgL
SR	Salt River	Theodore Roosevelt Dam to ~~the Verde River~~ 2 km below Granite Reef Dam		~~A&Wc~~	A&Ww			FBC		DWS	FC	AgI	AgL
~~SR~~	~~Salt River~~	~~Verde River to 2 km below Granite Reef Dam~~			~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~	~~AgI~~	~~AgL~~
~~SR~~	~~Salt River~~	~~2 km below Granite Reef Dam to I-10 bridge~~				~~A&Wc~~			~~PBC~~				
~~SR~~	~~Salt River~~	~~I-10 bridge to the 23rd Ave WWTP~~				~~A&Wc~~			~~PBC~~				
~~SR~~	~~Salt River (EDW)~~	~~23rd Ave WWTP to confluence with Gila River~~					~~A&Wedw~~		~~PBC~~		~~FC~~	~~AgI~~	~~AgL~~
SR	Slate Creek	Tributary to Tonto Creek at 33°56'24"/ 111°18'25"			A&Ww			FBC			FC		AgL
SR	Snake Creek ~~(UW)~~ (OAW)	Tributary to the Black River at 33°40'30"/ 109°28'55"		A&Wc				FBC			FC		AgL
SR	Spring Creek	Tributary to Tonto Creek at 34°09'54"/ 111°10'08"			A&Ww			FBC			FC		AgL
SR	Stinky Creek ~~(UW)~~ (OAW)	Tributary to the Black River, West Fork at 33°51'22"/109°27'07"		A&Wc				FBC			FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
~~SR~~	~~Tempe Town Lake~~	~~At Mill Avenue Bridge~~			~~A&Ww~~			~~FBC~~			~~FC~~		
SR	Thomas Creek	Tributary to Beaver Creek at 33°42'29"/109°15'11"		A&Wc				FBC			FC		AgL
SR	Thompson Creek	Tributary to the West Fork of the Black River~~, West Fork~~ at 33°53'24"/109°28'48"		A&Wc				FBC			FC		AgL
SR	Tonto Creek	Headwaters to confluence with unnamed tributary at 34°18'10"/111°04'14"		A&Wc				FBC			FC	AgI	AgL
SR	Tonto Creek	Below confluence with unnamed tributary to Roosevelt Lake at 33°45'14"/111°14'17"			A&Ww			FBC			FC	AgI	AgL
SR	Turkey Creek	Tributary to Rock Creek at 33°58'30"/111°06'47"		A&Wc				FBC			FC		
SR	Unnamed Wash (EDW)	~~Globe WWTP outfall to Pinal Creek~~ Cobre Valley Plaza WWTP at 33°24'56"/110°49'43" to confluence with Russell Gulch					A&Wedw		PBC				
SR	Wildcat Creek	Tributary to Centerfire Creek at 33°43'41"/109°26'28"		A&Wc				FBC			FC		AgL
SR	Willow Creek	Tributary to Beaver Creek at 33°43'52"/109°18'04"		A&Wc				FBC			FC		AgL
SR	Workman Creek	Headwaters to confluence with Reynolds Creek at 33°52'17"/111°00'14.5"		A&Wc				FBC			FC	AgI	AgL
SR	Workman Creek	Below confluence with Reynolds Creek to Salome Creek at 33°52'37"/111°02'20"			A&Ww			FBC			FC	AgI	AgL
UG	Apache Creek	Tributary to the Gila River at 32°52'08"/109°11'53"			A&Ww			FBC			FC		AgL
UG	Ash Creek	Headwaters to confluence with unnamed tributary at 32°45'37"/109°52'22"		A&Wc				FBC			FC		AgL
UG	Ash Creek	Below confluence with unnamed tributary to Gila River at 32°53'35"/109°47'34.8"			A&Ww			FBC			FC		AgL
UG	Bennett Wash (EDW)	ADOC-Safford WWTP outfall at 32°50'20"/109°34'44" to the Gila River					A&Wedw		PBC				
UG	Bitter Creek	Tributary to the Gila River at 32°50'17"/109°10'59"			A&Ww			FBC			FC		
UG	Blue River	Headwaters to confluence with Strayhorse Creek at 33°29'02"/110°12'12"		A&Wc				FBC			FC	AgI	AgL
UG	Blue River	Below confluence with Strayhorse Creek to San Francisco River at 33°12'36"/109°11'27.6"			A&Ww			FBC			FC	AgI	AgL
UG	Bonita Creek ~~(Unique Water)~~ (OAW)	San Carlos Indian Reservation to the Gila River at 32°53'35"/109°28'41"			A&Ww			FBC		DWS	FC		AgL
UG	Buckalou Creek	Tributary to Castle Creek at 33°43'34"/109°09'07"		A&Wc				FBC			FC		AgL
UG	Campbell Blue Creek	Tributary to the Blue River at 33°43'30"/109°02'46"		A&Wc				FBC			FC		AgL
UG	Castle Creek	Tributary to Campbell Blue Creek at 33°44'06"/109°08'10"		A&Wc				FBC			FC		AgL
UG	Cave Creek ~~(Unique Water)~~ (OAW)	Headwaters to confluence with South Fork Cave Creek at 31°53'04"/109°10'27"		A&Wc				FBC			FC	AgI	AgL
UG	Cave Creek ~~(Unique Water)~~ (OAW)	Below confluence with South Fork Cave Creek to Coronado ~~NF Boundary~~ National Forest boundary			A&Ww			FBC			FC	AgI	AgL
UG	Cave Creek	Below Coronado ~~NF Boundary~~ National Forest boundary to New Mexico border at 31°58'19"/109°03'00"			A&Ww			FBC			FC	AgI	AgL
UG	Cave Creek, South Fork	Tributary to Cave Creek at 31°53'04"/109°10'27"		A&Wc				FBC			FC	AgI	AgL
UG	Chase Creek	Headwaters to the Phelps-Dodge Morenci Mine			A&Ww			FBC			FC		AgL
UG	Chase Creek	Below the Phelps-Dodge Morenci Mine to San Francisco River				A&We			PBC				
UG	Chitty Canyon Creek	Tributary to Salt House Creek at 33°30'32"/109°24'04"		A&Wc				FBC			FC		AgL
UG	Cima Creek	Tributary to Cave Creek at 31°52'19"/109°14'02"		A&Wc				FBC			FC		AgL
UG	Cluff Ranch Pond #1	32°48'55"/109°49'15"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
UG	Cluff Ranch Pond #2	32°49'15"/109°50'33"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
UG	Cluff Ranch Pond #3	32°48'20"/109°51'43"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
UG	Coleman Creek	Tributary to Campbell Blue Creek at 33°44'20"/109°09'32"		A&Wc				FBC			FC		AgL
UG	Dankworth Ponds	32°43'15"/109°42'15"	Sedimentary	A&Wc				FBC			FC		
UG	Deadman Canyon Creek	Headwaters to confluence with unnamed tributary at 32°43'50"/109°49'01"		A&Wc				FBC		DWS	FC		AgL

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
UG	Deadman Canyon Creek	Below confluence with unnamed tributary to confluence with Graveyard Wash at 32°46'48"/109°44'13"			A&Ww			FBC		DWS	FC		AgL
UG	Eagle Creek	Headwaters to confluence with unnamed tributary at 33°23'24"/109°29'35"		A&Wc				FBC		DWS	FC	AgI	AgL
UG	Eagle Creek	Below confluence with unnamed tributary to Eagle Creek at 32°57'36"/109°24'21.6"			A&Ww			FBC		DWS	FC	AgI	AgL
UG	East Eagle Creek	Tributary to Eagle Creek at 33°29'38"/109°28'05"		A&Wc				FBC			FC		AgL
UG	East Turkey Creek	Headwaters to confluence with unnamed tributary at 31°58'22"/109°12'17"		A&Wc				FBC			FC		AgL
UG	East Turkey Creek	Below confluence with unnamed tributary to terminus near San Simon River at 31°59'53"/109°07'37"			A&Ww			FBC			FC		AgL
UG	East Whitetail	Headwaters to terminus near San Simon River at 32°08'52"/109°09'25" in the Chiricahua Mountains			A&Ww			FBC			FC		AgL
UG	Emigrant Canyon	Headwaters to terminus near San Simon River at 32°17'02"/109°20'27.6" in the Chiricahua Mountains			A&Ww			FBC			FC		AgL
UG	Evans Pond	32°49'15"/109°51'15"	Sedimentary		A&Ww			FBC			FC		
UG	Fishhook Creek	Tributary to the Blue River at 33°35'13"/109°10'01"		A&Wc				FBC			FC		AgL
UG	Foote Creek	Tributary to the Blue River at 33°35'24"/109°08'49"		A&Wc				FBC			FC		AgL
UG	Frye Canyon Creek	Headwaters to Frye Mesa Reservoir at 32°45'09.5"/109°50'02"		A&Wc				FBC		DWS	FC		AgL
UG	Frye Canyon Creek	Below Frye Mesa Reservoir to Highline Canal Headwaters to terminus near San Simon River at 32°50'10"/109°45'43"			A&Ww			FBC			FC		AgL
UG	Frye Mesa Reservoir	32°45'13"/109°50'00"	Igneous	A&Wc				FBC		DWS	FC		
UG	Gibson Creek	Tributary to Marijilda Creek at 32°41'24"/109°48'11"		A&Wc				FBC			FC		AgL
UG	Gila River	New Mexico border to the San Carlos Indian Reservation at 33°05'37"/110°03'21"			A&Ww			FBC			FC	AgI	AgL
UG	Grant Creek	Tributary to the Blue River at 33°34'16"/109°10'37"		A&Wc				FBC			FC		AgL
UG	Judd Lake	33°51'15"/109°09'15"	Sedimentary	A&Wc				FBC			FC		
UG	K P Creek (UW) (OAW)	Tributary to the Blue River at 33°31'44"/109°12'04"		A&Wc				FBC			FC		AgL
UG	Lanphier Canyon Creek	Tributary to the Blue River at 33°35'42"/109°07'52"		A&Wc				FBC			FC		AgL
UG	Little Blue Creek	Headwaters to confluence with Dutch Blue Creek at 33°24'26.5"/109°09'18"		A&Wc				FBC			FC		AgL
UG	Little Blue Creek	Below confluence with Dutch Blue Creek to Blue Creek at 32°22'30"/109°10'30"			A&Ww			FBC			FC		AgL
UG	Little Creek	Tributary to the San Francisco River at 33°49'41"/109°04'26"		A&Wc				FBC			FC		
UG	Lower George's Reservoir	33°51'23.5"/109°08'28"	Sedimentary	A&Wc				FBC			FC		AgL
UG	Luna Lake	33°49'45"/109°05'15"	Sedimentary	A&Wc				FBC			FC		AgL
UG	Marijilda Creek	Headwaters to confluence with Gibson Creek at 32°41'23"/109°48'13"		A&Wc				FBC			FC		AgL
UG	Marijilda Creek	Below confluence with Gibson Creek to Stockton Wash at 32°46'30"/109°40'51.6"			A&Ww			FBC			FC	AgI	AgL
UG	Markham Creek	Tributary to the Gila River at 32°56'17"/109°53'13"			A&Ww			FBC			FC		AgL
UG	Pigeon Creek	Tributary to the Blue River at 33°16'08"/109°11'42"			A&Ww			FBC			FC		AgL
UG	Raspberry Creek	Tributary to the Blue River at 33°30'07"/109°12'32"		A&Wc				FBC			FC		
UG	Roper Lake	32°45'20"/109°42'11"	Sedimentary		A&Ww			FBC			FC		
UG	San Francisco River	Headwaters to the New Mexico border at 33°49'24.5"/109°02'46"		A&Wc				FBC			FC	AgI	AgL
UG	San Francisco River	New Mexico border to the Gila River at 33°14'25"/109°02'49"			A&Ww			FBC			FC	AgI	AgL
UG	San Simon River	Tributary to the Gila River at 32°49'52"/109°38'53"				A&We			PBC				AgL
UG	Sheep Tank	32°46'15"/109°48'08"	Sedimentary		A&Ww			FBC			FC		AgL
UG	Smith Pond	32°49'09"/109°50'26"	Sedimentary		A&Ww			FBC			FC		
UG	Squaw Creek	Tributary to Thomas Creek at 33°23'38"/109°12'22"		A&Wc				FBC			FC		AgL
UG	Stone Creek	Tributary to the San Francisco River at 33°50'38"/109°02'46"		A&Wc				FBC			FC	AgI	AgL
UG	Strayhorse Creek	Tributary to the Blue River at 33°29'02"/109°12'11"		A&Wc				FBC			FC		

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				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
UG	Thomas Creek	Headwaters to confluence with Rousensock Creek at 33°23'45"/109°13'13"		A&Wc				FBC			FC		AgL
UG	Thomas Creek	Below confluence with Rousensock Creek to Blue River at 33°23'20"/109°11'20"			A&Ww			FBC			FC		AgL
UG	Tinny Pond	33°47'49"/109°04'23"	Sedimentary		A&Ww			FBC			FC		AgL
UG	Turkey Creek	Tributary to Campbell Blue Creek at 33°44'10"/109°04'05"		A&Wc				FBC			FC		AgL
UG	Unnamed Wash (EDW)	ADOC-Globe WWTP outfall at 33°24'55"/110°42'35" to the San Carlos Indian Reservation					A&Wedw		PBC				
VR	American Gulch	Headwaters to the Northern Gila County Sanitary District WWTP outfall (Payson) at 34°14'05"/111°22'18"			A&Ww			FBC			FC	AgI	AgL
VR	American Gulch (EDW)	Northern Gila County Sanitary District WWTP outfall (Payson) to the East Verde River at 34°14'42"/111°25'08"					A&Wedw		PBC				
VR	Apache Creek	Tributary to Walnut Creek at 34°55'12"/112°50'42"			A&Ww			FBC			FC		AgL
VR	Ashbrook Wash	Headwaters to the ~~Ft~~ Fort McDowell Reservation at 33°36'54"/111°42'06"				A&We			PBC				
VR	Aspen Creek	Tributary to Granite Creek at 34°31'55"/112°28'19"			A&Ww			FBC			FC		
VR	Bar Cross Tank	35°00'40"/112°05'34"			A&Ww			FBC			FC		AgL
VR	Barrata Tank	35°02'43"/112°24'17"			A&Ww			FBC			FC		AgL
VR	Bartlett Lake	33°49'00"/111°37'45"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
VR	Beaver Creek	Tributary to the Verde River at 34°34'26"/111°51'14"			A&Ww			FBC			FC		AgL
VR	Big Chino Wash	Tributary to Sullivan Lake at 34°52'37"/112°28'37"				A&We			PBC				AgL
VR	Bitter Creek	Headwaters to the Jerome WWTP outfall at 34°45'08"/112°06'25"				A&We			PBC				AgL
VR	Bitter Creek (EDW)	Jerome WWTP outfall to the Yavapai Apache Indian Reservation at 34°45'45.5"/112°04'44"					A&Wedw		PBC				AgL
VR	Bitter Creek	Below the Yavapai Apache Indian Reservation to the Verde River at 34°46'37"/112°02'53"			A&Ww			FBC			FC	AgI	AgL
VR	Black Canyon Creek	Headwaters to confluence with unnamed tributary at 34°39'20"/112°05'05"		A&Wc				FBC			FC		AgL
VR	Black Canyon Creek	Below confluence with unnamed tributary to the Verde River at 34°40'59"/111°57'28.8"			A&Ww			FBC			FC		AgL
VR	Bonita Creek	Tributary to Ellison Creek at 34°20'56"/111°14'20"		A&Wc				FBC			FC		
VR	Bray Creek	Tributary to Webber Creek at 34°22'37"/111°20'53"		A&Wc				FBC			FC		AgL
VR	Camp Creek	Tributary to the Verde River at 33°45'32"/111°30'14"			A&Ww			FBC			FC		AgL
VR	Carter Tank	34°52'27"/112°57'28"			A&Ww			FBC			FC		AgL
VR	Cereus Wash	Headwaters to the Fort McDowell Indian Reservation at 33°34'13"/111°42'28"				A&We			PBC				
VR	Chase Creek	Tributary to the East Verde River at 34°22'48"/111°16'59"		A&Wc				FBC		DWS	FC		
VR	Clover Creek	Tributary to headwaters of West Clear Creek at 34°33'04"/111°24'11"		A&Wc				FBC			FC		AgL
VR	~~Coffe~~ Coffee Creek	Tributary to Spring Creek at 34°48'18"/111°55'41"			A&Ww			FBC			FC		AgL
VR	Colony Wash	Headwaters to the Fort McDowell Indian Reservation at 33°35'42"/111°42'15"				A&We			PBC				
VR	Dead Horse Lake	34°45'00"/112°00'30"	Shallow	~~A&Wc~~	A&Ww			FBC			FC		
VR	Deadman Creek	Tributary to Horseshoe Reservoir at 34°00'00"/111°42'36"			A&Ww			FBC			FC		AgL
VR	Del Rio Dam Lake	34°48'55"/112°28'00"	Sedimentary		A&Ww			FBC			FC		AgL
VR	Dry Beaver Creek	Tributary to Beaver Creek at 34°37'59"/111°49'34"			A&Ww			FBC			FC	AgI	AgL
VR	Dry Creek (EDW)	Sedona Ventures WWTP outfall at 34°50'45"/111°52'15" to confluence with Dry Creek at 34°50'31"/111°52'39"					A&Wedw		PBC				
VR	Dude Creek	Tributary to the East Verde River at 34°23'06"/111°16'26"		A&Wc				FBC			FC	AgI	AgL
VR	East Verde River	Headwaters to confluence with Ellison Creek at 34°21'10"/111°16'47.5"		A&Wc				FBC		DWS	FC	AgI	AgL
VR	East Verde River	Below confluence with Ellison Creek to the Verde River at 34°17'02"/111°40'19"			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Ellison Creek	Tributary to the East Verde River at 34°21'11"/111°16'48"		A&Wc				FBC			FC		AgL
VR	Fossil Creek	Tributary to the Verde River at 34°18'22"/111°40'30"			A&Ww			FBC			FC		AgL

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
VR	Fossil Springs	34°25'24"/111°34'25"			A&Ww			FBC		DWS	FC		
VR	Foxboro Lake	34°53'48"/111°40'00"			A&Ww			FBC			FC		AgL
VR	Fry Lake	35°03'45"/111°48'02"			A&Ww			FBC			FC		AgL
VR	Gap Creek	Headwaters to Government Spring at 34°23'23"/111°50'53.5"		A&Wc				FBC			FC		AgL
VR	Gap Creek	Below Government Spring to the Verde River at 34°24'50"/111°46'51.6"			A&Ww			FBC			FC		AgL
VR	Garrett Tank	35°18'57"/112°42'16"			A&Ww			FBC			FC		AgL
VR	Goldwater Lake, Lower	34°29'55"/112°27'18"	Sedimentary	A&Wc				FBC		DWS	FC		
VR	Goldwater Lake, Upper	34°29'51"/112°26'55"	Igneous	A&Wc				FBC		DWS	FC		
VR	Granite Basin Lake	34°37'01"/112°42'16"	Igneous	A&Wc	~~A&Ww~~			FBC			FC	AgI	AgL
VR	Granite Creek	Headwaters to ~~confluence with Willow Creek~~ Watson Lake at ~~34°36'55"/112°25'05"~~ 34°35'15"/112°25'05"		A&Wc				FBC			FC	AgI	AgL
VR	Granite Creek	Below ~~confluence with Willow Creek~~ Watson Lake to the Verde River at 34°52'54"/112°25'05"			A&Ww			FBC			FC	AgI	AgL
VR	Heifer Tank	35°20'28"/112°32'56"			A&Ww			FBC			FC		AgL
VR	Hell Canyon Tank	35°05'00"/112°24'06"	Igneous		A&Ww			FBC			FC		AgL
VR	Homestead Tank	35°21'23"/112°41'32"	Igneous		A&Ww			FBC			FC		AgL
VR	Horse Park Tank	34°58'15"/111°36'29"			A&Ww			FBC			FC		AgL
VR	Horseshoe Reservoir	33°59'00"/111°42'30"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
VR	Houston Creek	Tributary to the Verde River at 34°16'55"/111°41'06"			A&Ww			FBC			FC		AgL
VR	J.D. Dam Lake	35°04'01"/112°01'40"	Shallow	A&Wc				FBC			FC	AgI	AgL
VR	Jacks Canyon Wash	Headwaters to Big Park WWTP outfall at 34°45'32"/111°45'10"				A&We			PBC				
VR	Jacks Canyon Wash (EDW)	Big Park WWTP outfall to Dry Beaver Creek at 34°44'28"/111°46'01"					A&Wedw		PBC				
VR	Lime Creek	Tributary to Horseshoe Reservoir at 33°59'20"/111°44'13"			A&Ww			FBC			FC		AgL
VR	McLellan Reservoir	35°13'15"/112°17'05"	Igneous		A&Ww			FBC			FC	AgI	AgL
VR	Meath Dam Tank	35°07'46"/112°27'35"			A&Ww			FBC			FC		AgL
VR	Mullican Place Tank	34°44'16"/111°36'08"	Igneous		A&Ww			FBC			FC		AgL
VR	Oak Creek ~~(Unique Water)~~ (OAW)	Headwaters to confluence with unnamed tributary at 34°57'08.5"/111°45'13"		A&Wc				FBC		DWS	FC	AgI	AgL
VR	Oak Creek ~~(Unique Water)~~ (OAW)	Below confluence with unnamed tributary at 34°57'08.5"/111°45'13" to Verde River			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Oak Creek, West Fork ~~(Unique Water)~~ (OAW)	Tributary to Oak Creek at 34°59'13"/111°44'46"		A&Wc				FBC			FC		AgL
VR	Odell Lake	34°56'02"/111°37'52"	Igneous	A&Wc				FBC			FC		
VR	Peck's Lake	34°47'07"/112°02'30"	Shallow	~~A&We~~	A&Ww			FBC			FC	AgI	AgL
VR	Perkins Tank	35°06'42"/112°04'08"	Shallow	A&Wc				FBC			FC		AgL
VR	Pine Creek	Headwaters to confluence with unnamed tributary at 34°21'51"/111°26'46"		A&Wc				FBC		DWS	FC	AgI	AgL
VR	Pine Creek	Below confluence with unnamed tributary to East Verde River at 34°13'19"/111°29'27.6"			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Red Creek	Tributary to the Verde River at 34°09'47"/111°43'12"			A&Ww			FBC			FC		AgL
VR	Red Lake	35°12'19"/113°03'55"	Sedimentary		A&Ww			FBC			FC		AgL
VR	Reservoir #1	35°13'05"/111°50'07"	Igneous		A&Ww			FBC			FC		
VR	Reservoir #2	35°13'16"/111°50'36"	Igneous		A&Ww			FBC			FC		
VR	Roundtree Canyon Creek	Tributary to Tangle Creek at 34°09'04"/111°48'18"			A&Ww			FBC			FC		AgL
VR	Scholze Lake	35°11'53"/112°00'31"	Igneous	A&Wc	~~A&Ww~~			FBC			FC		AgL
VR	Spring Creek	Headwaters to confluence with unnamed tributary at 34°57'23.5"/111°57'19"		A&Wc				FBC			FC	AgI	AgL
VR	Spring Creek	Below confluence with unnamed tributary at 34°44'38"/111°54'19" to Oak Creek			A&Ww			FBC			FC	AgI	AgL
VR	Steel Dam Lake	35°13'36"/112°24'51"	Igneous	A&Wc				FBC			FC		AgL
VR	Stehr Lake	34°21'59"/111°40'00"	Sedimentary		A&Ww			FBC			FC		AgL
VR	Stone Dam Lake	35°13'36"/112°24'16"		A&Wc				FBC			FC	AgI	AgL
VR	Stoneman Lake	34°46'44"/111°31'05"	Shallow	A&Wc				FBC			FC	AgI	AgL
VR	Sullivan Lake	34°51'46"/112°27'41"			A&Ww			FBC			FC	AgI	AgL
VR	Sycamore Creek	Headwaters to confluence with unnamed tributary at 35°03'40"/111°57'28"		A&Wc				FBC			FC	AgI	AgL

~~BASIN~~ Watershed	~~SEGMENT~~ Surface Waters	~~LOCATION~~ Segment Description and Location (Latitude and Longitudes are in NAD 27)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
VR	Sycamore Creek	Below confluence with unnamed tributary to Verde River at 34°51'47"/112°04'41"			A&Ww			FBC			FC	AgI	AgL
VR	Sycamore Creek	Tributary to Verde River at 33°37'55"/ 111°39'58"			A&Ww			FBC			FC	AgI	AgL
VR	Sycamore Creek	Tributary to Verde River at 34°04'42"/ 111°42'14"			A&Ww			FBC			FC		AgL
VR	Tangle Creek	Tributary to ~~the~~ Verde River at 34°05'06"/ 111°42'36"			A&Ww			FBC			FC	AgI	AgL
VR	Trinity Tank	35°27'44"/112°47'56"			A&Ww			FBC			FC		AgL
VR	Unnamed Wash	Flagstaff Meadows WWTP outfall at 36°14'17"/111°49'28" to Volunteer Wash at 35°11'55"/111°49'42"					A&Wedw		PBC				
VR	Verde River	Above Bartlett Dam from confluence of Chino Wash and Granite Creek to Bartlett Lake			A&Ww			FBC			FC	AgI	AgL
VR	Verde River	Below Bartlett Lake Dam to Salt River			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Walnut Creek	Tributary to Big Chino Wash at 34°58'12"/ 112°34'55"			A&Ww			FBC			FC		AgL
VR	Watson Lake	34°35'15"/112°25'05"	Igneous		A&Ww			FBC			FC	AgI	AgL
VR	Webber Creek	Tributary to the East Verde River at 34°18'50"/111°19'55"		A&Wc				FBC			FC		AgL
VR	West Clear Creek	Headwaters to confluence with Meadow Canyon at 34°33'40"/111°31'30"		A&Wc				FBC			FC		AgL
VR	West Clear Creek	Below confluence with Meadow Canyon to the Verde River at 34°30'14"/111°49'41"			A&Ww			FBC			FC	AgI	AgL
VR	Wet Beaver Creek	Headwaters to unnamed springs at 34°41'17"/ 111°34'34"		A&Wc				FBC			FC	AgI	AgL
VR	Wet Beaver Creek	Below unnamed springs to Dry Beaver Creek at 34°37'59"/111°49'33.6"			A&Ww			FBC			FC	AgI	AgL
VR	Whitehorse Lake	35°07'00"/112°00'47"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
VR	Williamson Valley Wash	Headwaters to confluence with Mint Wash at 34°49'05"/112°37'55"				A&We			PBC				AgL
VR	Williamson Valley Wash	Confluence of Mint Wash to 10.5 km ~~dwnstm~~ downstream at 34°49'05"/111°37'55"			A&Ww			FBC			FC		AgL
VR	Williamson Valley Wash	Below 10.5 km downstream of Mint Wash confluence to Big Chino Wash at 32°52'52"/ 112°28'48"				A&We			PBC				AgL
VR	Williscraft Tank	35°11'23"/112°35'38"			A&Ww			FBC			FC		AgL
VR	Willow Creek	~~Tributary to Granite Creek at 34°51'47"/ 112°25'52"~~ Above Willow Creek Reservoir	Shallow	A&Wc				FBC			FC		AgL
VR	Willow Creek	Below Willow Creek Reservoir to confluence with Granite Creek			A&Ww			FBC			FC		AgL
VR	Willow Creek Reservoir	34°36'17"/112°26'19"	Shallow		A&Ww			FBC			FC	AgI	AgL
VR	Willow Valley Lake	34°41'08"/111°19'57"	Sedimentary		A&Ww			FBC			FC		AgL
~~WP~~	~~Big Creek~~	~~Tributary to Pitchfork Canyon at 32°35'24"/ 109°57'07"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~Goudy Canyon Creek~~	~~Pinaleno Mountains~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~Grant Creek~~	~~Headwaters to confluence with unnamed tributary at 32°38'09.5"/109°56'35"~~		~~A&Wc~~				~~FBC~~		~~DWS~~	~~FC~~		~~AgL~~
~~WP~~	~~Grant Creek~~	~~Below confluence with unnamed tributary~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~High Creek~~	~~Headwaters to confluence with unnamed tributary at 32°33'07"/110°14'40"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~High Creek~~	~~Below confluence with unnamed tributary~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~Lake Cochise~~	~~South of Twin Lakes Municipal Golf Course at 32°14' N / 109°11' W~~					~~A&Wedw~~		~~PBC~~				
~~WP~~	~~Moonshine Creek~~	~~Tributary to Post Creek at 32°40'52"/ 109°54'25"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~Pinery Creek~~	~~Headwaters to State Highway 181 at 32°00'24"/109°25'16"~~		~~A&Wc~~				~~FBC~~		~~DWS~~	~~FC~~		~~AgL~~
~~WP~~	~~Pinery Creek~~	~~Below State Highway 181~~			~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~		~~AgL~~
~~WP~~	~~Post Creek~~	~~Tributary to Grant Creek at 32°40'05"/ 109°54'58"~~		~~A&Wc~~				~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~WP~~	~~Riggs Flat Lake~~	~~32°42'27"/109°57'51"~~		~~A&Wc~~				~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~WP~~	~~Rock Creek~~	~~Tributary to Turkey Creek at 31°53'20"/ 109°30'00"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~Snow Flat Lake~~	~~32°39'09"/109°51'52"~~		~~A&Wc~~				~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~WP~~	~~Soldier Creek~~	~~Tributary to Post Creek at 32°40'52"/ 109°54'40"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~Turkey Creek~~	~~Headwaters to confluence with Rock Creek at 31°53'20"/109°30'00"~~		~~A&Wc~~				~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~WP~~	~~Turkey Creek~~	~~Below confluence with Rock Creek~~			~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
~~WP~~	~~Ward Canyon Creek~~	~~Tributary to Turkey Creek at 31°51'47"/ 109°20'13"~~		~~A&Wc~~				~~FBC~~			~~FC~~		~~AgL~~
~~WP~~	~~Willcox Playa~~	~~Sulphur Springs Valley~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~

Watersheds
BW = Bill Williams
CG = Colorado – Grand Canyon
CL = Colorado – Lower Gila
LC = Little Colorado
MG = Middle Gila
SC = Santa Cruz – Rio Magdelena – Rio Sonoyta
SP = San Pedro – Willcox Playa – Rio Yaqui
SR = Salt River
UG = Upper Gila
VR = Verde River

Other Abbreviations
WWTP = Wastewater Treatment Plant
Km = kilometers

Appendix C. ~~Repealed~~ Site-Specific Standards

Watershed	Surface Water	Surface Water Description & Location	Parameter	Site-Specific Criterion
SR	Pinto Creek	From confluence of Ellis Ranch tributary at 33°19'26.7"/110°54'57.5" to the confluence of West Fork of Pinto Creek at 33°27'32.3"/ 111°0'19.7"	Copper (D)	42 µg/L
LC	Rio de Flag (EDW)	Flagstaff WWTP outfall to the confluence with San Francisco Wash at 35°14'04"/ 111°28'02.5"	Copper (D)	36 µg/L
CL	Yuma East Wetlands	From inlet culvert from Colorado River into restored channel to Ocean bridge	Selenium (T) Total residual chlorine	2.2 mg/L 33 µg/L (A&Ww acute) 20 µg/L (A&Ww chronic)