

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. Due to time restraints, the Secretary of State's Office will no longer edit the text of proposed rules. We will continue to make numbering and labeling changes as necessary. 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 adoption, amendment, or repeal of any rule. A.R.S. §§ 41-1013 and 41-1022.

NOTICE OF PROPOSED RULEMAKING

TITLE 14. PUBLIC SERVICE CORPORATIONS; CORPORATIONS AND ASSOCIATIONS; SECURITIES REGULATION

CHAPTER 4. CORPORATION COMMISSION - SECURITIES

PREAMBLE

- | | |
|------------------------------------|---------------------------------|
| <u>1. Sections Affected</u> | <u>Rulemaking Action</u> |
| R14-4-121 | Amend |
- 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. §§ 44-1821

Implementing statute: A.R.S. §§ 44-1946 and 44-1949

Constitutional authority: Arizona Constitution, Article XV, §§ 4, 6, and 13
- 3. A list of all previous notices appearing in the Register:**

Notice of Rulemaking Docket Opening: 6 A.A.R. 2858, August 4, 2000
- 4. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:**

Name:	Cheryl T. Farson
Address:	Corporation Commission Securities Division 1300 West Washington, Third Floor Phoenix, Arizona 85007-2996
Telephone:	(602) 542-4242
Fax:	(602) 594-7470
- 5. An explanation of the rule, including the agency's reasons for initiating the rule:**

A.A.C. R14-4-121 ("rule 121") limits the sales activities of a securities salesman so that the salesman may not sell securities on behalf of more than one dealer at one time and on behalf of no more than three dealers during any one six-month period. The Arizona Corporation Commission--Securities Division (the "Division") proposes to amend the rule. The amended rule 121 would allow a salesman to sell securities on behalf of affiliated dealers and to sell securities on behalf of unaffiliated dealers if the dealers file with the Commission a copy of a written agreement regarding the dual representation.

The Division proposes this action in recognition of the various and varied relationships among entities engaging in financial services. The Division believes that the proposed amendment of rule 121 serves the public by allowing an investor to access various financial services and products offered by different dealers through one salesman. The Division does not believe that amendment of rule 121 compromises investor protection because each dealer remains responsible for the conduct of its salesmen.

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6. Reference to any study that the agency proposes to rely on in its evaluation of or justification for the proposed rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study, and other supporting material:

None

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:

The proposed amendment of rule 121 does not diminish a previous grant of authority.

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

Not applicable

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:

Not applicable

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: June 7, 2001

Time: 9:30 a.m.

Location: Arizona Corporation Commission
1300 West Washington Avenue, Conference Room A
Phoenix, Arizona 85007

Nature: Oral proceeding. Subsequent to the oral proceeding, the Arizona Corporation Commission will taken final action at an open meeting with respect to the making of the proposed rule.

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 rule follows:

**TITLE 14. PUBLIC SERVICE CORPORATIONS; CORPORATIONS AND ASSOCIATIONS;
SECURITIES REGULATION**

CHAPTER 4. CORPORATION COMMISSION - SECURITIES

ARTICLE 1. IN GENERAL RELATING TO THE ARIZONA SECURITIES ACT

Section

R14-4-121. Limitation on Activities of Securities Salesmen; Definitions

ARTICLE 1. IN GENERAL RELATING TO THE ARIZONA SECURITIES ACT

R14-4-121. Limitation on Activities of Securities Salesmen; Definitions

A. As used in this Section, the following terms have the meaning indicated:

1. "Affiliate" means a person that directly or indirectly through 1 or more intermediaries controls, is controlled by, or is under common control with the person specified.
2. "Registered salesman" means an individual registered to sell securities pursuant to A.R.S. Title 44, Chapter 12, Article 9.

B. Salesmen registered to sell securities pursuant to the Securities Act will not be allowed to sell securities for any more than 3 registered dealers during any 1-6 month period, and A registered salesman shall not be allowed to sell securities for more than 1 dealer at 1 in Arizona during the same time period, unless one of the following applies:

1. The dealers for which the registered salesman sells securities are affiliates.
2. The dealers have filed with the Commission a copy of a written agreement that the registered salesman may sell securities for each of the dealers, which is signed by all of the dealers.

NOTICE OF PROPOSED RULEMAKING

TITLE 17. TRANSPORTATION

CHAPTER 4. DEPARTMENT OF TRANSPORTATION - MOTOR VEHICLE DIVISION

PREAMBLE

1. Sections Affected

Rulemaking Action

R17-4-901	Amend
R17-4-902	Amend
R17-4-903	Amend
R17-4-904	Amend
R17-4-905	Amend
R17-4-906	Amend
R17-4-907	Amend
R17-4-908	Amend
R17-4-909	Amend
R17-4-910	Repeal
R17-4-911	Amend
R17-4-912	Amend
R17-4-913	Amend

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. § 28-366

Implementing statutes: A.R.S. §§ 28-673, 28-951, 28-1147, 28-1321, 28-1385, 28-1463, 28-2054, 28-2059, 28-3228, 28-3306, 28-3310, 28-4007, 28-4143, 28-4144, 28-4153, 28-4366, 28-4494, 28-4495, 28-4496, 28-4498, 28-4499, 28-4500, 28-4538, 28-4554, 28-4627, 28-4665, 28-5004, 28-5011, 28-5013, 28-5107, 28-5108, 28-5109, 28-5232, 28-5237, 28-5612, 28-5614, 28-5628, 28-5631, 28-5638, 28-5725, 28-5726, 28-5738, 28-5745, 28-5749, 28-5865, 28-7906, 28-8244, 28-8328, 28-8425, 32-2373, 32-2391, and 41-1061 to 41-1066

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

Notice of Rulemaking Docket Opening: 7 A.A.R. 1387, March 30, 2001

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

Name: Lynn S. Golder
Hearing Officer II

Address: Arizona Department of Transportation
Motor Vehicle Division, Mail Drop 507M
3737 North 7th Street, Suite 160
Phoenix, Arizona 85014-5017

Telephone: (602) 712-7941

Fax: (602) 241-1624

E-mail: lgolder@dot.state.az.us

To track progress of this rule and any other agency rulemaking matters, please visit the ADOT web site address at: www.dot.state.az.us/about/rules.

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

The Arizona Department of Transportation, Motor Vehicle Division (Division) proposes to amend R17-4, Article 9, dealing with the administrative hearing process. The revisions make Article 9 clear, concise, and understandable and update statutory citations.

The Division is repealing R17-4-910 and adding the substance of the repealed rule to R17-4-904. The Division is also:

- Deleting the definition of "in absentia" from R17-4-901,

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- Adding 7 definitions to R17-4-901,
- Deleting subsections from several rules, and
- Adding subsections to several rules.

6. A reference to any study that the agency proposes to rely on in its evaluation of or justification for the proposed rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:

None

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:

The Division determined that the administrative hearing, rehearing, and judicial review rules result in costs to:

- State agencies, including the Department of Transportation, the Department of Public Safety, the Attorney General's Office, the Governor's Regulatory Review Council, and the Secretary of State's Office;
- Arizona courts providing judicial review of Executive Hearing Office decisions;
- Law enforcement agencies of political subdivisions;
- Members of the public who participate in Executive Hearing Office proceedings;
- Attorneys and law firms; and
- Employers of people participating in Executive Hearing Office proceedings.

The Division determined that the benefits of providing due process, as required by statute, outweigh the costs.

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: Lynn S. Golder
Hearing Officer II

Address: Arizona Department of Transportation
Motor Vehicle Division, Mail Drop 507M
3737 North 7th Street, Suite 160
Phoenix, Arizona 85014-5017

Telephone: (602) 712-7941

Fax: (602) 241-1624

E-mail: lgolder@dot.state.az.us

10. The time, place, and nature of the proceedings for the making, 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:

Written comments on the proposed rulemaking or preliminary summary of economic, small business, and consumer impact should be submitted to the person specified in question #4 no later than the close of the record at 5:00 p.m., on June 29, 2001. The Division has scheduled an oral proceeding by videoconference.

Date: Tuesday, June 26, 2001

Time: 2:00 p.m.

Locations:

Flagstaff	Phoenix	Tucson
Arizona Department of Transportation District Office Board Room 1801 South Milton Road Flagstaff, Arizona 86001	Arizona Department of Transportation Headquarters Green Room, Room #186 206 South 17th Avenue Phoenix, Arizona 85007	Arizona Department of Transportation District Office Board Room 1221 South 2nd Avenue Tucson, Arizona 85713

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

Not applicable

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

None

13. The full text of the rules follows:

TITLE 17. TRANSPORTATION

CHAPTER 4. DEPARTMENT OF TRANSPORTATION - MOTOR VEHICLE DIVISION

**ARTICLE 9. ADMINISTRATIVE ~~HEARINGS, REHEARINGS~~ HEARING, REHEARING, AND APPEAL
JUDICIAL REVIEW**

Section

R17-4-901.	Definitions
R17-4-902.	Requests <u>Request for hearing a Hearing</u>
R17-4-903.	Notice of hearing <u>Hearing</u>
R17-4-904.	Administrative hearings <u>Hearing Procedure</u>
R17-4-905.	Rules <u>Admissibility of evidence Evidence</u>
R17-4-906.	Time computations <u>Computation</u>
R17-4-907.	Motions <u>Motion Practice</u>
R17-4-908.	Subpoenas <u>Subpoena Issuance</u>
R17-4-909.	Forms <u>Document Filing</u>
R17-4-910.	Administrative decisions <u>Repealed</u>
R17-4-911.	Continuances <u>Continuing an Administrative Hearing</u>
R17-4-912.	Rehearing and appeal <u>Judicial Review</u>
R17-4-913.	Summary review <u>Review of 0-10 suspension an Administrative Per Se Suspension Order</u>

**ARTICLE 9. ADMINISTRATIVE ~~HEARINGS, REHEARINGS~~ HEARING, REHEARING, AND APPEAL
JUDICIAL REVIEW**

R17-4-901. Definitions

A. The following definitions are applicable to In this Article 9, unless otherwise stated in a statute or a specific rule otherwise requires:

1. "Administrative hearing" means a scheduled proceeding, conducted by the executive hearing office of the Motor Vehicle Division, proceeding to decide for deciding a dispute based on facts the evidence presented to an administrative hearing officer law judge. A hearing provides:
 - a. Advance notice to participants of record, and
 - b. An opportunity for witnesses to testify under oath.
2. "Administrative ~~hearing officer~~ law judge" means a person who conducts a summary review or presides at an administrative hearing, with the power to administer oaths, take testimony, rule on questions of evidence and make determinations of fact powers listed in R17-4-904(B).
3. "Affidavit" means a ~~written or printed~~ declaration or statement of facts under oath made:
 - a. In writing, and
 - b. Under oath or affirmation.
4. "Business day" means a day other than a Saturday, Sunday, or state holiday.
5. "Corrective action" means an action affecting a license, permit, certificate, approval, registration, or other permission issued by the Arizona Department of Transportation or the Division.
46. "Deposition" means ~~the a witness' testimony of a witness;~~
 - a. Given under oath or affirmation,
 - b. taken by another through Brought out by another person's oral questions, and
 - c. reduced Reduced to writing for presentation in a proceeding.
57. "Director" means the ~~Division director of the Motor Vehicle Division of the Arizona Department of Transportation,~~ Motor Vehicle Division Director.
68. "Division" means the ~~Motor Vehicle Division of the Arizona Department of Transportation,~~ Motor Vehicle Division.

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79. "Executive hearing office" means ~~that the~~ the branch of the Division Director's office that is designated to conduct con-
ducts administrative hearings through the statutory power granted to the Division director and the director of the Ari-
zona Department of Transportation and summary reviews.
8. "In absentia" means ~~without the petitioner being present.~~
10. "Good cause" means a substantial reason to:
- Continue an administrative hearing, or
 - Extend the time period for filing affidavits opposing a motion for rehearing.
11. "In writing" means:
- An original document.
 - A photocopy.
 - A facsimile, or
 - An e-mail message.
12. "Irregularity" means an administrative proceeding error, other than an error deliberately made to:
- Help or harm a participant in the proceeding, or
 - Affect the outcome of the proceeding.
913. "Motion" means a written or oral proposal for consideration and action, ~~with or without notice.~~
1014. "Petitioner" means ~~the~~ a person or entity who requests relief an administrative hearing or a summary review from
the Department executive hearing office.
1115. "Respondent" means ~~the~~ a person who makes an or entity held to answer to an action an executive hearing office
proceeding.
16. "Summary review" means an executive hearing office proceeding, other than an administrative hearing, conducted
under A.R.S. § 28-1385(L) or other statute or under an administrative rule.
17. "Under oath or affirmation" means a witness' statement, made to a person with the power to administer oaths and
affirmations, supporting the truth of the witness' evidence.

R17-4-902. Requests Request for hearings a Hearing

- A. All requests for hearings ~~A petitioner or petitioner's attorney shall be submitted timely file a request for a hearing to and~~
~~received by the:~~
- By mail or hand delivery to the executive hearing office's street address:
Executive Hearing Office, Arizona Department of Transportation, Motor Vehicle Division, 1801 West Jefferson,
Phoenix, Arizona 85007 3737 North 7th Street, Suite 160, Phoenix, Arizona 85014-5017;
 - By facsimile to (602) 241-1624; or
 - By e-mail to the executive hearing office's e-mail address:
HEARINGOFFICE@dot.state.az.us.
 - Timeliness is determined as of the date the executive hearing office receives a hearing request.
- B. ~~If a time period to request a hearing is not specified by statute a statute does not provide a time period for requesting a~~
~~hearing, the time period lasts for the request for hearing shall be received by the executive hearing office not later than 15~~
~~days from after the date the Division served notice, pursuant to applicable law on a corrective action notice.~~
- C. All requests ~~A request~~ a request for a hearing ~~shall be legible and shall include the petitioner's name and mailing address for receipt~~
~~of mail.~~

R17-4-903. Notice of hearing Hearing

- ~~A. The executive hearing office shall be the only entity to issue notice setting administrative hearings.~~
- ~~B.A. When If a petitioner files a timely request for a hearing is filed with the executive hearing office under R17-4-902, the~~
~~executive hearing office shall send a notice of hearing to the petitioner at the petitioner's mailing address set forth in the~~
~~request for a hearing and to any other participant of record.~~
- B. The notice of hearing shall ~~contain~~ state the:
- Time, date, and place of the administrative hearing,;
 - Type of administrative hearing, and
 - ~~Legal~~ Statutory authority under which for the proceedings are to be held administrative hearing.

R17-4-904. Administrative hearings Hearing Procedure

- A. All hearings ~~shall be presided over by the An administrative hearing officer~~ law judge shall preside at an administrative
hearing.
- B. The ~~An~~ An administrative hearing officer law judge shall:
- ~~Conduct fair and impartial hearings.~~
 - ~~Take all necessary action to avoid delay.~~
 - ~~Maintain order.~~
 - ~~Require parties to state their position with respect to the various issues in the proceedings.~~
 - ~~Regulate the course of the hearing.~~

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6. ~~Regulate the conduct of counsel, parties and other participants.~~
7. ~~Examine witnesses and direct witnesses to testify.~~
8. ~~Maintain record of proceedings.~~
9. ~~Rule on motions.~~
10. ~~Cause to be issued subpoenas for the attendance of witnesses and for the production of other evidence as deemed necessary to the proceedings.~~
11. ~~Administer oaths.~~
12. ~~Make a decision on the basis of the record before him which shall include findings of fact and conclusions of law.~~
 1. Administer oaths;
 2. At the administrative law judge's discretion, issue subpoenas for attendance of witnesses and production of documents or things;
 3. Avoid delay;
 4. Conduct a fair and impartial administrative hearing;
 5. Have the parties state their positions on the issues;
 6. Issue a written decision and order, including findings of fact and conclusions of law, based on the record;
 7. Maintain an administrative hearing record;
 8. Maintain order;
 9. Question witnesses and have witnesses testify;
 10. Regulate the conduct of participants;
 11. Regulate the course of an administrative hearing; and
 12. Rule on motions.
- C. ~~If the hearing officer finds that public health, safety or welfare imperatively requires emergency action, and incorporates a finding to that effect in his order, summary suspension of a license may be ordered pending proceedings for revocation or other action. These proceedings shall be promptly instituted and determined. An administrative law judge may order summary suspension of a license according to A.R.S. § 41-1064(C).~~
- D. ~~A petitioner may appear in person or through counsel in any hearing held pursuant to these rules, unless otherwise specified by law. In a case involving the Uniform Motor Vehicle Safety Responsibility Act, a petitioner may request, in writing prior to the hearing, that the hearing be held in absentia. An administrative law judge shall sustain a corrective action supported by the record and the law.~~
- E. Unless otherwise required by statute, an administrative law judge may take an administrative hearing decision under advisement.
- F. The executive hearing office shall serve the administrative hearing decision, including findings of fact and conclusions of law:
 1. On a party and a party's attorney; and
 2. In person or by regular mail, unless otherwise required by statute.

R17-4-905. Rules Admissibility of evidence Evidence

- A. ~~Formal~~ Unless otherwise provided by statute, the rules of evidence shall do not apply to the proceedings held at the executive hearing office an administrative hearing.
- B. ~~The An~~ administrative hearing officer law judge shall decide what evidence shall be admissible determine the admissibility of evidence.
- C. ~~Hearsay evidence shall be admissible in an administrative hearing and given such weight as the An administrative hearing officer law judge:~~
 1. May admit hearsay evidence, and
 2. ~~determines~~ Shall determine the evidentiary weight of any hearsay evidence admitted.
- D. ~~A deposition of If a witness who cannot be subpoenaed; or is unable to attend an administrative hearing, an administrative law judge shall be admissible and given such weight as the administrative hearing officer determines admit the witness' deposition or affidavit and determine its evidentiary weight. All expenses shall be borne by the The party taking the a witness' deposition or affidavit shall bear all deposition-related costs.~~

R17-4-906. Time computations Computation

In computing a time period under this Article, the executive hearing office shall:

- A. ~~In computing any period of time prescribed or allowed by these rules; Exclude the day of the act from which the designated period of triggering the time period begins to run shall not be included;~~
- B. ~~The last day of the period so computed shall be included, unless it If the last day is a Saturday, a Sunday, or a legal holiday, in which event the period runs until extend the time period to the end of the next business day which is not a Saturday, a Sunday, or a legal holiday;~~
- C. ~~When If the time period of time prescribed or allowed is less than 11 days, intermediate Saturdays, Sundays, and legal holidays shall be excluded in the computation count only the business days; and~~

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D. After service by mail, extend the time period by 5 days.

R17-4-907. ~~Motions~~ Motion Practice

- A.** ~~Motions~~ A party or a party's attorney making a motion shall state in the motion the relief sought, and the factual basis for relief and the legal authority relied upon for the relief.
1. ~~If made prior to the hearing, such motions~~ For a pre-hearing motion, a party or a party's attorney shall be:
 - a. Make the motion in writing, and
 - b. File the motion to the executive hearing office at least 5 days before the administrative hearing.
 2. ~~If made at the~~ For a motion made at an administrative hearing:
 - a. ~~they may be stated~~ A party or a party's attorney may make the motion orally but, and
 - b. ~~the~~ The administrative hearing officer law judge may require that they be reduced to writing and filed with him the party or the party's attorney to file the motion in writing after the administrative hearing.
- B.** A ruling on any motion may be incorporated into the administrative hearing officer's ultimate findings of fact, conclusions of law, and decision or order. An administrative law judge may include a ruling on a motion in an administrative hearing decision.

R17-4-908. ~~Subpoenas~~ Subpoena Issuance

- A.** ~~The~~ In connection with an administrative hearing, an administrative hearing officer law judge shall have may issue subpoenas to compel the attendance of witnesses by subpoena or the production of documents or things.
1. A party or a party's attorney requesting a subpoena shall file a written subpoena request, briefly stating the substance of the evidence sought.
 2. An administrative law judge has discretion to issue or deny a subpoena based on the:
 - a. Relevance of the evidence sought, or
 - b. Reasonable need for the evidence sought.
- B.** ~~Upon request of the petitioner or his legal counsel to issue a subpoena compelling the attendance of witnesses or evidence, it shall be the obligation of those parties to:~~ A party or a party's attorney requesting a subpoena shall:
1. Draft the subpoena in proper the correct form-, including:
 - a. The caption and docket number of the matter;
 - b. A list of documents or things to be produced;
 - c. The full name and address of:
 - i. The custodian of the documents or things listed, or
 - ii. A person ordered to appear;
 - d. The time, date, and place to appear or to produce documents or things; and
 - e. The name, address, and telephone number of the party or the party's attorney requesting the subpoena;
 2. ~~Secure the necessary~~ Obtain an administrative law judge's signature from the executive hearing office on the subpoena-
 3. ~~Ensure that such subpoenas are served upon the parties~~ service of the subpoena on the person named in the subpoena, and
 4. ~~Incur all expenses, including witness fees if any. Bear all subpoena-related costs.~~
- C.** Unless otherwise provided by statute or administrative rule, a party or a party's attorney requesting a subpoena shall have the subpoena served by a person who:
1. Is at least age 18 and is not a party to the administrative hearing;
 2. Delivers, within Arizona, a copy of the subpoena to the person named in the subpoena;
 3. If the subpoena requires the named person's attendance at an administrative hearing, hands the named person the amount prescribed in A.R.S. § 12-303 as the witness fee for 1 day's attendance and allowed mileage; and
 4. Files with the executive hearing office a proof of service, signed by the person who served the subpoena, certifying:
 - a. The date of service.
 - b. The manner of service, and
 - c. The name of the person served.
- D.** A party or a person served with a subpoena who objects to the subpoena or a portion of the subpoena, may file an objection in writing with the executive hearing office. The party or person served with the subpoena shall:
1. State in the objection the reasons for objecting; and
 2. Timely file the objection:
 - a. Within 5 days after service of the subpoena; or
 - b. If the subpoena was served less than 5 days before an administrative hearing, at the start of the hearing.
- E.** An administrative law judge may quash or modify a subpoena if:
1. The subpoena is unreasonable or imposes an undue burden, or
 2. The evidence sought may be obtained by another method.

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~~CE.~~ Subpoenas issued shall be served, and upon application to the court by a party or the agency, enforced in the same manner provided by law for the service and enforcement of subpoenas in a civil action, ~~unless~~ Unless otherwise provided by law or agency statute or administrative rule, a party or a party's attorney requesting a subpoena shall enforce the subpoena in the Superior Court of Arizona, in the county where the administrative hearing is held.

R17-4-909. Forms Document Filing

- A. ~~Documents~~ A document filed pursuant to a ~~in an executive hearing office~~ proceeding shall ~~show state:~~
1. The description and title of the proceeding;
 2. The name of the party filing the document;
 3. The date ~~signed the document was signed;~~
 4. ~~Title~~ The title and address of the signatory the document's signer; and
 5. ~~Name of the party involved in the action;~~
6. ~~If a represented by legal counsel party files a document,~~ the attorney's name, law firm, address, and ~~phone~~ telephone number.
- B. ~~Every paper~~ A party or a party's attorney shall sign a document filed with the executive hearing office ~~shall be signed by the party filing it or by legal counsel. The signature constitutes a certificate by the signer that he has~~ By signing, the signer certifies that:
1. The signer read the paper document;
 2. that to the best of his knowledge, information and belief there is good ground to support it; The document is supported by the facts and the law or by a good faith argument to extend, modify, or reverse the law; and
 3. that it The document is not interposed filed to harass, for delay, or needlessly increase the cost of the executive hearing office proceeding.
- C. A document is filed as of the date the executive hearing office receives the document.

R17-4-910. Administrative decisions Repealed

~~A copy of the administrative hearing officer's written findings of fact and conclusions of law along with the final order shall be served upon the petitioner or his legal counsel either in person or by mail as prescribed by law.~~

R17-4-911. Continuances Continuing an Administrative Hearing

- A. ~~A decision by the administrative hearing officer may be taken under advisement unless otherwise prescribed by law. A participant of record in an administrative hearing may file a request for a continuance. A continuance request is timely if received by the executive hearing office at least 7 business days before the hearing date. If a request is untimely, an administrative law judge shall deny a continuance unless:~~
1. The requester states the reasons preventing a timely request; and
 2. The administrative law judge determines that the explanation under subsection (A)(1) supports review of the merits of the continuance request.
- B. ~~Hearings may be continued for good cause by the~~ After reviewing the merits of a request for a continuance, an administrative hearing officer law judge has discretion to grant or deny a continuance based on:
1. The requirement to avoid delay in an administrative hearing, or
 2. The requirement that the request establish good cause to continue an administrative hearing.
- C. ~~Any continuances granted shall be justified~~ An administrative law judge shall include in the record the reasons for denying a continuance.

R17-4-912. Rehearing and appeal Judicial Review

- A. ~~Any~~ A party in a contested case before the executive hearing office who is aggrieved by a ~~an administrative hearing~~ decision rendered in such case may file with the executive hearing office, ~~not later than 15 days after service of the original decision, unless otherwise prescribed by law, a written motion for rehearing of the original decision, specifying, stating in detail the particular reasons for a rehearing should be granted. Unless otherwise provided by statute, a motion for rehearing is timely if received by the executive hearing office within 15 days after:~~
1. The date of in-person service of the administrative hearing decision, or
 2. The mailing date of the administrative hearing decision.
- B. A timely motion for rehearing stays a corrective action, other than a:
1. Summary suspension under A.R.S. § 41-1064(C), or
 2. Corrective action sustained under subsection (H).
- BC. ~~A~~ If a motion for rehearing establishes 1 of the following causes, an administrative law judge may grant a rehearing of the original decision shall be granted for any of the following causes:
1. ~~Irregularity~~ An irregularity in:
 - a. ~~the administrative~~ The executive hearing office proceedings of the agency or its;
 - b. An action of the administrative hearing officer law judge, including an improper order or abuse of discretion, or;
 - c. An action of the prevailing party or any order or abuse of discretion, whereby the party was; and

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- d. ~~The irregularity deprived the aggrieved party of a fair administrative hearing;~~
 2. ~~Misconduct of Deliberate misconduct by the Division, the executive hearing officer office, the administrative hearing officer law judge, or the prevailing party;~~
 3. ~~Accident or surprise which the aggrieved party could not have been prevented by ordinary prudence;~~
 4. ~~Newly discovered material evidence which the aggrieved party could not have discovered with reasonable diligence have been discovered and produced at the original administrative hearing;~~
 5. ~~Excessive or insufficient penalties;~~
 6. ~~The original administrative hearing decision is not justified by the evidence or is contrary to supported by the facts or the law; and~~
 7. ~~Error An error in the admission or rejection of evidence or other errors of law occurring at during the original administrative hearing.~~
- ~~D.~~ **D.** An order granting a rehearing shall specify with particularity the reason on which the rehearing is granted.
- ~~CD.~~ **C.** The executive hearing office After a timely motion for rehearing, an administrative law judge may:
1. ~~affirm~~ **Affirm** or modify the administrative hearing decision; or
 2. ~~grant~~ **Grant** a rehearing for a reason listed in subsection (C):
 - a. ~~to To~~ **To** all or ~~any some~~ of the parties, and
 - b. ~~on On~~ **On** all or ~~part some~~ of the issue issues for any of the reasons set forth in subsection (B).
- E.** ~~The executive hearing office In spite of any motion for rehearing, an administrative law judge may on its own initiative, order a rehearing of its original decision for any a reason for which it might have granted a rehearing on motion of a party listed in subsection (C).~~
- F.** ~~The executive hearing office An administrative law judge may require the filing of written briefs upon on the issues raised in the a motion for rehearing.~~
- G.** ~~When a If a party aggrieved by an administrative hearing decision bases a motion for rehearing is based upon on affidavits;~~
1. ~~they The aggrieved party shall be served;~~
 - a. ~~File the affidavits with the motion;~~ and
 - b. ~~Serve on all other parties, in person or by regular mail, the motion for rehearing and affidavits;~~
 2. ~~Within 15 days after service of the aggrieved party's motion for rehearing and affidavits, An opposing a party may, within 15 days after such service, serve opposing affidavits, which period may be extended for an additional 20 days by the executive hearing office for good cause shown or by written stipulation of the parties;~~
 3. ~~An administrative law judge may extend, for a period determined by the administrative law judge, the time for serving opposing affidavits if a party:~~
 - a. ~~Establishes good cause, or~~
 - b. ~~Files a written stipulation for a time extension signed by all the parties; and~~
 4. ~~Reply affidavits may be permitted at the discretion of the administrative hearing officer An administrative law judge may permit the aggrieved party to file reply affidavits.~~
- H.** ~~An administrative law judge may issue an administrative hearing decision as a final decision without an opportunity for a rehearing If in a particular decision the executive hearing office if the administrative law judge makes specific findings that:~~
1. ~~the The public health, safety, and welfare require immediate effectiveness of such the administrative hearing decision is necessary for the immediate preservation of the public peace, health and safety; and~~
 2. ~~that a A rehearing of the decision is impractical, unnecessary, or contrary to the public interest, the decision may be issued as a final decision without an opportunity for a rehearing.~~
 3. ~~If a decision is issued as a final decision without an opportunity for rehearing, any application for judicial review shall be made within Within the statutory time limits period prescribed in A.R.S. § 12-904, a party aggrieved by an administrative decision under subsection (H) may proceed according to subsection (I).~~
- I.** ~~To the extent that provisions of these rules conflict with the provisions of any statute providing for rehearing of decisions of the Division, such statutory provisions shall govern.~~
- J.** ~~A party may appeal aggrieved by a final administrative hearing decision of the executive hearing office to may appeal or request judicial review in the Superior Court of Arizona as provided by law statute.~~

R17-4-913. Summary review Review of 0.10 suspension an Administrative Per Se Suspension Order

- A.** Definitions: "Summary review" is an alternative to a hearing, conducted by the executive hearing office of the Motor Vehicle Division, when a person has been issued a license/permit suspension A petitioner issued a driving privilege suspension order under the provisions of the administrative per se law, A.R.S. § 28-694 28-1385, (License suspension if blood or breath alcohol test results indicate a concentration of 0.10 or more) may request summary review instead of a hearing.
1. The requirements of R17-4-902 apply to a summary review request.
 2. The petitioner or the petitioner's attorney may include with the summary review request a written statement of:

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- a. The reasons why the Division should not suspend the petitioner's driving privilege, and
 - b. Evidence that at least 1 issue in subsections (C)(1) to (C)(3) was not met.
- B.** ~~Scope of~~ An administrative law judge conducting summary review of a suspension order under A.R.S. § 28-1385 shall:
 - ~~21. The~~ Conduct the summary review is conducted without the person being present and the decision is final ~~petitioner's presence.~~
 - ~~12. The summary review is an examination of all written documents only, submitted to the Motor Vehicle Division. Examine the documents in the executive hearing office case file, and~~
 - ~~3. The~~ Issue a written summary review decision rendered shall uphold or cancel sustaining or voiding the suspension order issued.
- C.** An administrative law judge conducting summary review of a suspension order under A.R.S. § 28-1385 shall consider each factor in the scope of the summary review. The scope of the summary review consists of the following factors examined during a summary review shall be limited to the following:
 - 1. Whether the law enforcement officer's certification certified report reflects ~~that~~ the officer had reasonable grounds to believe the applicant petitioner was driving or ~~was~~ in actual physical control of a motor vehicle while under the influence of intoxicating liquor;
 - 2. Whether the law enforcement officer's certification certified report reflects ~~that~~ the applicant was officer placed the petitioner under arrest for a violation of A.R.S. § 28-692 §§ 4-244(33), 28-1381, 28-1382, or 28-1383, and the petitioner complied with A.R.S. § 28-691 28-1321;
 - 3. Whether the law enforcement officer's certification certified report reflects ~~that a test was taken, the results of which indicated a~~ for the petitioner indicating at least the applicable alcohol concentration of 0.10 or more stated in A.R.S. § 28-1385; and
 - 4. Whether the petitioner's written statement of ~~explanation of the applicant as to~~ the reasons why the Division should not suspend the applicant's petitioner's driving privilege provides convincing evidence that at least 1 ~~or more~~ issues ~~issue~~ in subsections (C)(1), ~~(2) and (3) were to~~ (C)(3) was not met.
- D.** ~~No summary review shall be conducted unless the applicant has done 1 of the following:~~
 - ~~1. Has surrendered his Arizona driver's license/permit.~~
 - ~~2. Certified that his Arizona driver's license/permit was lost or destroyed.~~
 - ~~3. Certified that he does not have a valid Arizona driver's license.~~
 - ~~4. Certified that he is a nonresident with a valid out-of-state driver's license.~~
- E.** ~~Application for a summary review is made available to all persons arrested for a violation of A.R.S. § 28-692 and who have complied with A.R.S. § 28-691 and have a alcohol concentration exceeding the legal limit.~~

NOTICE OF PROPOSED RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 11. DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER QUALITY STANDARDS

PREAMBLE

1. Sections Affected

R18-11-101
R18-11-102
R18-11-104
R18-11-105
R18-11-106
R18-11-107
R18-11-108
R18-11-109
R18-11-110
R18-11-111
R18-11-112
R18-11-113
R18-11-114
R18-11-115
R18-11-118
R18-11-120
R18-11-121
R18-11-122
R18-11-123
Appendix A
Appendix B

Rulemaking Action

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

Authorizing statutes: §§ 49-202(A), 49-203(A)(1), and 49-221

Implementing statute: A.R.S. § 49-222

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

A Notice of Rulemaking Docket Opening is published in this issue of the *Register*.

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

Name: Mr. Steven Pawlowski
Address: 3033 North Central Avenue, MO 301C
Phoenix, Arizona 85012-2809
Telephone: (602) 207-4219
Fax: (602) 207-4528
E-mail: pawlowski.steven@ev.state.az.us

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

The Clean Water Act Requires That ADEQ Initiate a Water Quality Standards Rulemaking

Almost 30 years ago, Congress enacted landmark legislation to prevent water pollution in the nation's waters. This legislation was the Federal Water Pollution Control Act Amendments of 1972 (1972 FWPCA). The 1972 FWPCA and its subsequent amendments are commonly known as the Clean Water Act. In the Clean Water Act, Congress directed states to adopt water quality standards for "waters of the United States" located within the states' jurisdictions.

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

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1. §303(c) defines a water quality standard as the designated uses of a surface water and the water quality criteria necessary to support those uses [See §303(c)(2)(A)].
2. A state must consider the use of surface waters for public water supply, propagation of fish and wildlife, recreation, agricultural uses, industrial uses, and navigation when it establishes water quality standards [See §303(c)(2)(A)].
3. State-adopted water quality standards must protect the public health and welfare, enhance the quality of water, and “serve the purposes of the Clean Water Act” [See §303(c)(2)(A)].
4. States must review their water quality standards at least once every 3 years using a process that includes public participation [See §303(c)(1)].
5. The U.S. Environmental Protection Agency (EPA) reviews state-adopted water quality standards. §303(c) provides authority for the federal promulgation of a water quality standard if EPA determines that a state-adopted water quality standard is inconsistent with applicable requirements of the Clean Water Act or EPA determines that a federal water quality standard is necessary to meet the requirements of the Clean Water Act [See §303(c)(2)(A), §303(c)(3) and §303(c)(4)].
6. States are required to adopt water quality criteria for toxic pollutants listed under §307(a)(1) of the Clean Water Act for which EPA has published national criteria guidance if the presence of a toxic pollutant in a surface water could reasonably be expected to interfere with the designated uses of a surface water. The 126 toxic pollutants listed under §307(a)(1) of the Clean Water Act are called the priority pollutants. Water quality criteria for priority pollutants must be numeric criteria (except where numeric criteria are unavailable). If numeric criteria for a priority pollutant are unavailable, then a state must adopt water quality criteria based on biological monitoring or assessment methods consistent with EPA guidance [See §303(c)(2)(B) and §304(A)(8)].

§303(c) of the Clean Water Act requires that Arizona establish surface water quality standards and review them every three years. This review process is known as the triennial review.

State Law Requires That ADEQ Initiate a Water Quality Standards Rulemaking

A.R.S. § 49-202(A) designates the Arizona Department of Environmental Quality [ADEQ] as the state agency for all purposes of the Clean Water Act. As the responsible state agency in Arizona, ADEQ must implement the requirements of §303(c) of the Clean Water Act stated above. ADEQ has a duty to conduct the triennial review of surface water quality standards, and, as appropriate, adopt or modify the standards.

Arizona law requires that ADEQ adopt or modify water quality standards through a rulemaking process [See A.R.S. § 49-203 and § 49-221]. § 49-203(A)(1) states that ADEQ shall adopt, by rule, water quality standards in accordance with legislative guidelines prescribed by Title 49, Chapter 2, Article 2 of the Arizona Revised Statutes. Title 49, Chapter 2, Article 2 of the Arizona Revised Statutes addresses water quality standards. § 49-221 addresses water quality standards generally and § 49-222 specifically addresses water quality standards for “navigable waters” [See discussion of the applicability of water quality standards to “waters of the United States,” “navigable waters,” and “surface waters” later in this preamble]. § 49-221(A) requires ADEQ to adopt water quality standards by rulemaking for all navigable waters to preserve and protect water quality for all present and reasonably foreseeable future uses. § 49-221(C) states that ADEQ must consider the following factors when the agency establishes water quality standards:

1. The protection of the public health and the environment;
2. The uses which have been made, are being made, or with reasonable probability may be made of surface waters;
3. The provisions and requirements of the Clean Water Act and Safe Drinking Water Act and the federal regulations adopted pursuant to those acts;
4. The degree to which standards for one category of waters [e.g., surface water] could cause violations of standards for other, hydrologically-connected water categories [e.g., groundwater];
5. Guidelines, action levels, or other numeric criteria adopted or recommended by EPA or any other federal agency; and
6. Any unique, physical, biological, or chemical properties of the waters.

Arizona law requires that surface water quality standards be expressed in terms of the uses to be protected. There is a statutory preference for numeric water quality standards if adequate information exists to establish a numeric standard. ADEQ also has authority to adopt any narrative water quality standard that ADEQ deems appropriate [See A.R.S. § 49-221(D)].

§ 49-222 prescribes legislative guidelines for the surface water quality standards program, restating some of the language in §303(c)(2)(A) of the Clean Water Act. § 49-222(A) requires that surface water quality standards assure water quality, if attainable, that provides for protecting the public health and welfare. § 49-222(A), like §303(c)(2)(A) of the Clean Water Act, says that the state's water quality standards shall enhance the quality of the water taking into consideration its use and value for public water supplies, the propagation of fish and wildlife, and for recreational, agricultural, industrial, and other purposes, including navigation.

§ 49-222(B) requires that ADEQ adopt numeric water quality standards for surface waters for each toxic pollutant listed by EPA pursuant to § 307 of the Clean Water Act [that is, for each of the 126 priority pollutants]. The law states that when ADEQ establishes numeric water quality standards, ADEQ may consider the effect of local water quality characteristics on the toxicity of specific pollutants, the varying sensitivities of local affected aquatic populations to toxic pollutants, and the extent to which the natural flow of the stream is intermittent or ephemeral resulting in a stream where the in-stream flow consists mostly of treated wastewater effluent. However, ADEQ may not establish a numeric water quality standard that is inconsistent with the Clean Water Act [See § 49-222(C)].

The purposes of the water quality standards program

Water quality standards are one of the cornerstones of the Clean Water Act and they play a central role in the successful implementation of Arizona's water quality management programs. Water quality standards define the water quality goals for surface waters in Arizona. They designate the uses to be protected in Arizona's surface waters and they prescribe the criteria that ADEQ determines are necessary to maintain and protect water quality for the designated uses. Water quality standards provide the regulatory basis for establishing water quality-based discharge limitations and other discharge controls in NPDES permits for point source discharges to surface waters. These water quality-based discharge limitations may be more stringent than technology-based effluent limitations for point sources that EPA prescribes in federal effluent guidelines regulations that implement the Clean Water Act. The water quality standards also provide the regulatory basis for establishing wasteload allocations and load allocations in total maximum daily load (TMDL) analyses. Water quality standards provide the basis for the implementation of best management practices (BMPs) to control nonpoint sources of pollution and for measuring the effectiveness of the BMPs. Finally, water quality standards provide the "yardstick" by which ADEQ assesses the water quality status of Arizona's rivers, streams, and lakes.

Water quality standards are established to "serve the purposes" of the Clean Water Act. These purposes are set forth in §101 of the Clean Water Act. The primary objective of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Congress articulated two ambitious goals in the Clean Water Act to achieve the primary objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. First, Congress set a goal of eliminating completely the discharge of pollutants into the waters of the United States. Second, Congress prohibited the discharge of toxic pollutants in toxic amounts to those waters [See §101(a)(1) and (3)]. While great progress has been made in improving water quality in the nation's waters since the enactment of the Clean Water Act, neither of the two ambitious national goals set forth in §101 have been achieved within the original deadlines prescribed in the Clean Water Act.

Congress also set forth an interim water quality goal to achieve, wherever attainable, a level of surface water quality that provides for: 1) the protection and propagation of fish, shellfish, and wildlife, and 2) recreation in and on the water. This interim water quality goal is known as the "fishable, swimmable" goal of the Clean Water Act [See §101(a)(2)]. In 1972, Congress envisioned that all of the waters of the United States should be fishable and swimmable wherever that level of water quality was attainable. The "fishable, swimmable" goal of the Clean Water Act has had a significant impact on Arizona's surface water quality standards. It has had a major impact on the types of designated uses that have been established for surface waters in Arizona and the stringency of the water quality criteria that are prescribed to maintain and protect water quality for the designated uses.

Summary of major issues for this triennial review

ADEQ considers revisions to the state's surface water quality standards in the triennial review. Water quality standards revisions may take many forms, including additions or modifications to designated uses, changes to water quality criteria, revisions to the state's antidegradation policy, new unique water or effluent dependent water classifications, and changes to general policies such as variances, nutrient waivers, and mixing zones. ADEQ has identified the following issues for consideration in this triennial review:

1. ADEQ proposes to revise the current definitions for "aquatic and wildlife (cold water fishery)," "aquatic and wildlife (warm water fishery)," "ephemeral water," and "effluent dependent water." ADEQ also proposes to add new definitions for "perennial surface water," "intermittent surface water," and "pollutant."
2. ADEQ proposes to revise the tributary rule at R18-11-105 as follows:

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- a. ADEQ proposes to repeal references in R18-11-105(2) to unlisted tributaries that are effluent dependent waters (EDWs). Under current state law, an EDW can be classified only through the rulemaking process. Consequently, every EDW in Arizona is specifically listed in the surface water quality standards rules. ADEQ proposes to delete R18-11-105(2) because it is impossible to have an *unlisted* tributary that is classified as an EDW.
 - b. ADEQ proposes to clarify how the tributary rule applies to perennial and intermittent streams that are above and below 5000 feet in elevation. The current tributary rule assigns designated uses to unlisted tributaries that are neither ephemeral waters nor effluent dependent waters and that have salmonids present [See R18-11-105(3)]. ADEQ proposes to repeal the language in R18-11-105(3) that refers to an “unlisted tributary that is not an ephemeral water or an effluent dependent water and which has salmonids present.” ADEQ intends to revise this subsection of the tributary rule to clarify that it applies to unlisted tributaries that are perennial and intermittent surface waters. ADEQ proposes to conform the rule to proposed changes to the definitions of “aquatic and wildlife (cold water)” and “aquatic and wildlife (warm water).” The proposed tributary rule reads: “The full body contact recreation, aquatic and wildlife (cold water), and fish consumption standards apply to a perennial or intermittent tributary that is above 5000 feet in elevation.”
 - c. ADEQ proposes to make similar revisions to part of the tributary rule that assigns designated uses to unlisted tributaries that are neither ephemeral nor effluent dependent waters and that do not have salmonids present [See R18-11-105(4)]. Again, ADEQ proposes to repeal language that refers to an “unlisted tributary that is not an ephemeral water or an effluent dependent water and which does not have salmonids present” and clarify that R18-11-105(4) applies to unlisted tributaries that are perennial or intermittent surface waters. The proposed rule states: “The full body contact recreation, aquatic and wildlife (warm water), and fish consumption standards apply to a perennial or intermittent tributary that is below 5000 feet in elevation.”
 - d. ADEQ proposes to repeal the part of the current tributary rule that applies the nearest downstream surface water quality standards to unlisted tributaries that are neither ephemeral waters or EDWs.
4. ADEQ proposes to repeal the part of the antidegradation rule at R18-11-107(D) that extends Tier 3 antidegradation protection to *proposed* unique waters. The new rule states at R18-11-107(D) that Tier 3 antidegradation protection applies only to surface waters that are actually classified as unique waters through the rulemaking process.
 5. ADEQ proposes to amend R18-11-108 (A)(4), the narrative standard which states that a surface water shall be free from pollutants in amounts or combinations that cause off-flavor in aquatic organisms or waterfowl. ADEQ proposes to repeal the reference to “or waterfowl” in this narrative standard because of the lack of practical implementation procedures to determine compliance with that part of the narrative standard.
 6. ADEQ proposes to amend the current narrative standard that addresses bottom deposits. ADEQ proposes to adopt language to clarify that the narrative standard is intended to prevent bottom deposits that impair aquatic life designated uses. ADEQ proposes to repeal language in the current standard that relates to the impairment of recreational uses because of the lack of objective criteria to determine when there is impairment of a recreational use and the lack of practical procedures to implement that part of the narrative standard.
 7. ADEQ proposes to adopt a new narrative standard to address excessive concentrations of suspended solids in a surface water that impair a domestic water source use.
 8. ADEQ proposes to revise the current numeric water quality standards for bacteria as follows:
 - a. ADEQ proposes to repeal the current fecal coliform criteria for the domestic water source (DWS), partial body contact (PBC), aquatic and wildlife uses (A&Wc, A&Ww, A&Wedw, and A&We), agricultural irrigation (AgI), and agricultural livestock watering (AgL) designated uses. ADEQ proposes to repeal the fecal coliform criteria because: 1) ADEQ questions the scientific basis of the current fecal coliform criteria for these designated uses, 2) microbiological water quality will be maintained and protected because *E. coli* criteria will apply to all surface waters through the FBC and PBC designated uses, and 3) the repeal of the fecal coliform criteria will eliminate unnecessary and redundant monitoring requirements.
 - b. ADEQ proposes to adopt new *E. coli* criteria for the PBC designated use. The new *E. coli* criteria replace the current fecal coliform criteria for PBC.
 - c. ADEQ proposes to establish the following *E. coli* criteria for the FBC and PBC designated uses: 1) A geometric mean of 126 cfu / 100 ml for both the FBC and PBC designated uses, and 2) a single sample maximum concentration of 235 cfu / 100 ml for the FBC designated use, and 3) a single sample maximum concentration of 576 cfu / 100 ml for the PBC designated use.

- d. ADEQ proposes to repeal the fecal coliform criteria for EDWs. EDWs will be protected by *E. coli* criteria that ADEQ proposes to apply to surface waters with the PBC designated use.
9. ADEQ proposes to revise the water quality standard for temperature at R18-9-109(E) to clarify that the criterion for “maximum change in temperature due to discharge” applies only to thermal discharges and it does not apply to storm water discharges. ADEQ proposes to revise footnote 4 at the end of R18-11-109 to state that the maximum temperature change criterion due to discharge does not apply to wastewater treatment plants that discharge to an EDW *or to storm water discharges*.
10. ADEQ proposes to repeal the numeric criteria for turbidity in R18-11-109(D) that are established to maintain and protect water quality for aquatic life designated uses. Instead ADEQ proposes to adopt a new numeric criterion for suspended sediment concentration (SSC) in R18-11-109(F) to protect aquatic life. The proposed SSC criterion is intended to apply at or near base flow and does not apply to a surface water at times when there is elevated flow that is a direct response to a precipitation event.
11. ADEQ proposes to add a subsection to R18-11-110 to incorporate by reference the Colorado River Salinity Control Forum plan of implementation.
12. ADEQ proposes to revise the unique waters rule at R18-11-112 to clarify the eligibility, nomination, and decision-making procedures and to include additional factors that ADEQ will consider when making decisions regarding unique water nominations and classifications. ADEQ received 37 nominations for unique waters classification in this triennial review. ADEQ is proposing 10 surface waters for classification as unique waters. The 10 surface waters proposed for classification as unique waters are:
1) Lee Valley Creek (above Lee Valley Lake) in the Little Colorado River watershed; 2) Bear Wallow Creek 3) North Fork of Bear Wallow Creek, 4) South Fork of Bear Wallow Creek, 5) Snake Creek, 6) Stinky Creek, 7) Hayground Creek, and 8) West Fork of the Black River in the Salt River watershed; 9) Upper Cienega Creek in the Santa Cruz River watershed; and 10) KP / Cienega Creek in the Upper Gila River watershed. ADEQ decided not to propose Pinto Creek, Lower Haunted Canyon Creek, and 25 other streams that were nominated for unique waters classification. Finally, ADEQ decided not to revise the current listing of Peeple’s Canyon Creek as a unique water as requested by the Bureau of Land Management.
13. ADEQ proposes to revise the current definition of “effluent dependent water” by repealing the word, “primarily,” in the current definition. ADEQ proposes to add Lake Cochise as an EDW and to revise the EDW description of Queen Creek in R18-11-113. Finally, ADEQ proposes to adopt a site-specific standard for dissolved copper of 36 µg / L for the Rio de Flag.
14. ADEQ proposes to revise the mixing zone rule at R18-11-114. The current mixing zone rule prohibits acute toxicity in a mixing zone [See R18-11-114(F)]. A complete prohibition of acute toxicity is inconsistent with current EPA guidance on mixing zones and the concept of a zone of passage that is currently allowed by the state mixing zone rule at R18-11-114 (I). ADEQ also proposes to make changes to the administrative procedures that apply to requests for a mixing zone. The current rule states that mixing zones are established by order of the Director. ADEQ will clarify that mixing zones are established as part of a NPDES permit for a point source discharge to a surface water and not by administrative order. Finally, ADEQ proposes a prohibition against mixing zones for persistent, bioaccumulative pollutants, including: chlordane, DDD, DDE, DDT, dieldrin, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, mercury, PCBs, TCDD 2,3,7,8 (dioxin), and toxaphene. ADEQ also will prohibit mixing zones for cadmium.
15. ADEQ proposes to repeal the nutrient waiver rule at R18-11-115.
16. ADEQ proposes to repeal R18-11-118(B) that relates to dams and flood control structures. R18-11-118(B) states that nothing in the surface water quality standards rules “shall be construed to require a person who operates a dam or flood control structure to operate the structure to cure or mitigate an exceedance of a water quality standard caused by another person.” This provision is an unnecessary restatement of R18-11-118(C). In ADEQ’s opinion, the only way that an operator of a dam or flood control structure may cure or mitigate a water quality standard violation caused by another person is by releasing water. This is already covered by R18-11-118(C).

17. ADEQ proposes to amend R18-11-120(C). ADEQ proposes to revise language in the current rule that relates to the determination of compliance with chronic aquatic and wildlife criteria. The current rule states that compliance with chronic aquatic and wildlife criteria shall be determined from the arithmetic mean of the analytical results of grab samples collected over a period of 4 consecutive days at a minimum rate of one grab sample per day. It is impractical for ADEQ to determine compliance with chronic A&W criteria under the current rule because ADEQ staff cannot stay at a sampling site for 4 consecutive days to collect the requisite number of samples. The proposed rule states that ADEQ will determine compliance with chronic aquatic and wildlife criteria from the geometric mean of the analytical results of the last 4 samples taken provided the samples are taken at least 24 hours apart.
18. ADEQ proposes to amend the language in R18-11-121(B) that prohibits a schedule of compliance for a new point source. ADEQ proposes to authorize schedules of compliance for new and recommencing point sources. The proposed rule is consistent with the federal NPDES permit regulation that addresses schedules of compliance for new and recommencing point source dischargers at 40 CFR §122.47. A schedule of compliance for a new point source is authorized only when one is necessary to allow a reasonable opportunity to attain compliance with a water quality standard that is issued after commencement of construction but less than 3 years before commencement of discharge. A schedule of compliance for a recommencing discharger is authorized when necessary to allow a reasonable opportunity to attain compliance with a water quality standard that has been issued or revised less than 3 years before recommencement of discharge.
19. ADEQ proposes to amend the variance rule at R18-11-122 to authorize a variance from a water quality standard on the ground that human-caused conditions or sources of pollution prevent attainment of a water quality standard and the conditions or sources cannot be remedied within 5 years or it would cause more environmental damage to correct the conditions or sources than to leave them in place. The proposed ground for a variance is based upon an assumption that attainment of the water quality standard can ultimately be achieved and that the human-caused conditions or sources of pollution can be remediated. The additional ground for a variance is consistent with EPA guidance on variances and is based on one of the grounds for use attainability analysis identified by EPA in 40 CFR §131.10(g)(3).
20. ADEQ proposes to amend R18-11-123 to prohibit the discharge of sewage from vessels to Lake Powell.
21. Proposed revisions to Appendix A:
 - a. ADEQ proposes to clarify the current sulfide standards that are established to protect the aquatic and wildlife designated uses. The current sulfide criteria are found in Appendix A, Table 2 of the surface water quality standards rules. A sulfide criterion of 100 mg / L has been established to prevent acute toxicity to aquatic organisms. This criterion applies to all surface waters and it does not distinguish between lentic systems (lakes, reservoirs, and ponds) and lotic systems (rivers and streams). ADEQ proposes to clarify the sulfide standard for lakes by adding a footnote to explain that the sulfide water quality criterion of 100 mg/L applies only to water samples that are taken from the epilimnion, or the upper layer of a lake or reservoir.
 - b. ADEQ proposes to add tables to Appendix A for certain hardness-dependent and pH-dependent parameters. The current acute and chronic aquatic and wildlife criteria for cadmium, chromium III, copper, lead, nickel, pentachlorophenol, silver, and zinc are expressed as mathematical equations that factor in the hardness or pH of the receiving surface water to derive a numeric water quality criterion. The numeric criteria for these parameters are not presented in the current rules. The applicable numeric criterion must be calculated using mathematical equations that are difficult for the average person to understand or use. ADEQ proposes to calculate the criteria for a range of hardness and pH values and present the derived criteria in a series of tables to make the standards more understandable and “user-friendly.”
 - c. ADEQ proposes to repeal the current aquatic and wildlife chronic toxicity criteria that are established for ephemeral waters.
 - d. ADEQ proposes to revise the numeric water quality criteria for the partial body contact designated use. ADEQ proposes to use a modified FBC methodology to derive criteria for PBC.
 - e. ADEQ proposes to update the human health and aquatic and wildlife criteria in Appendix A using current human health effects (i.e., updated reference doses and cancer potency slopes) and toxicity data.
 - f. ADEQ proposes to update the aquatic life criteria for ammonia for A&Wc and A&Ww to be consistent with EPA’s 1999 Update of the Ambient Water Quality Criteria for Ammonia.

22. Proposed revisions to Appendix B:

- a. ADEQ proposes to revise the aquatic and wildlife designated uses for A&W (cold water) and A&W (warm water) using the 5000 foot elevation as a predictive model for aquatic life use designation. Research conducted by ADEQ's biocriteria program shows that perennial streams above 5000 feet in elevation generally have cold water macroinvertebrate communities and those that are below 5000 feet in elevation generally have warm water macroinvertebrate communities. ADEQ proposes to use this information to refine the current A&Wc and A&Ww use designations for surface waters listed in Appendix B.
- b. ADEQ proposes to add Tempe Town Lake and establish designated uses for it in Appendix B.
- c. ADEQ proposes to revise the designated uses for Davidson Canyon. Davidson Canyon is incorrectly listed as an ephemeral water in Appendix B.
- d. ADEQ proposes to add the domestic water source (DWS) designated use to Canyon Lake in the Salt River basin and Lake Pleasant in the Middle Gila River basin.
- e. ADEQ will review surface waters with the partial body contact recreation (PBC) designated use to determine if there is any new information which indicates that the full body contact recreation (FBC) designated use is an attainable use.

Each of these issues is discussed in more detail in the following sections of the preamble. The discussion of issues in the preamble is organized by the numeric order of the surface water quality standards rules, starting with issues related to definitions in R18-11-101 and ending with issues related to the list of surface waters and their designated uses in Appendix B.

Definitions [R18-11-101]

The terms that are used in the surface water quality standards rules are defined in R18-11-101. ADEQ proposes to revise the current definitions for "aquatic and wildlife (cold water fishery)," "aquatic and wildlife (warm water fishery)," "ephemeral water," and "effluent dependent water." ADEQ also proposes to add new definitions for "perennial surface water," "intermittent surface water," and "pollutant."

- a. *Revision of the definitions of aquatic and wildlife (cold water fishery) and aquatic and wildlife (warm water fishery)*

ADEQ proposes to change the definitions of "aquatic and wildlife (cold water fishery)" ("A&Wc") and "aquatic and wildlife (warm water fishery)" ("A&Ww") to "aquatic and wildlife (cold water)" and "aquatic and wildlife (warm water)" respectively. The current definition of "aquatic and wildlife (cold water fishery)" is: Aquatic and wildlife (cold water fishery) means the use of a surface water by animals, plants, or other organisms, including salmonids, for habitation, growth, or propagation [See R18-11-101(7)].

The current definition of "aquatic and wildlife (warm water fishery)" is similar:

Aquatic and wildlife (warm water fishery) means the use of a surface water by animals, plants, or other organisms, excluding salmonids, for habitation, growth, or propagation [See R18-11-101 (10)].

Both aquatic life designated uses currently are defined by the presence or absence of salmonid species (e.g., trout). The use of the presence or absence of salmonids to define the A&Wc and A&Ww aquatic life designated uses is problematic for two reasons. First, not all cold surface waters contain salmonids but they do contain aquatic life and should be protected by A&Wc standards. Second, statewide data on the distribution of salmonid species in Arizona surface waters is lacking. ADEQ has relied on data supplied by the Arizona Game and Fish Department, the U.S. Fish and Wildlife Service, or anecdotal data to support the current A&Wc and A&Ww use designations. For many surface waters, it is not known whether salmonids are or are not present. Research conducted by the ADEQ Biocriteria Program on the distribution of bottom-dwelling aquatic invertebrates (i.e., benthic macroinvertebrates) in wadeable, perennial streams indicates that benthic macroinvertebrate communities are a better indicator of whether A&Wc or A&Ww water quality standards should apply to a surface water [See Spindler, Patti, "Macroinvertebrate Community Distribution Among Reference Sites in Arizona," Open File Report 00-05, Biocriteria Program, Arizona Department of Environmental Quality, October, 2000].

The findings of the report cited above are based on benthic macroinvertebrate data collected over 3 years at 89 reference sites statewide. 329 different taxa were collected in 240 bioassessments. Community patterns among the 89 reference sites were described using three multi-variate statistical methods: 1) de-trended correspondence analysis, 2) cluster analysis, and 3) discriminant function analysis. Statistical analyses of the bioassessment data resulted in the identification of two broad macroinvertebrate community types in Arizona. Elevation was consistently identified as the most important environmental variable explaining the two community types. ADEQ found that a warm water macroinvertebrate community inhabits wadeable, perennial streams in Arizona that are at elevations of 5000 feet or less. A cold water macroinvertebrate community inhabits wadeable, perennial streams that are at elevations of 5000 feet or more. The warm water macroinvertebrate community is uniquely adapted to floods and droughts in Arizona's arid landscape and consists of a resilient community that is taxonomically poorer than the cold water community. The cold water macroinvertebrate community is taxonomically richer and resembles benthic macroinvertebrate communities found in Rocky Mountain streams of other western states. All small- to medium-sized perennial streams in the state are predicted to be one of these two general macroinvertebrate community types.

The macroinvertebrate community is a better indicator of the A&Wc and A&Ww designated uses because: 1) All perennial surface waters contain benthic macroinvertebrates, and 2) ADEQ has now collected data statewide on the distribution of benthic macroinvertebrates in wadeable, perennial streams. Statistical analyses of data collected by the ADEQ biocriteria program show that there are identifiable differences between the benthic macroinvertebrate communities of cold and warm water streams. The data also show that there is a transition from cold water to warm water macroinvertebrate communities at approximately the 5000 foot elevation. ADEQ proposes to use the results of this research to refine the A&Wc and A&Ww designated uses in the state. ADEQ believes that the use of macroinvertebrate communities is a more scientifically defensible way to assign the A&Wc and A&Ww designated uses than the presence or absence of salmonids.

ADEQ proposes to change the name of "aquatic and wildlife (cold water fishery)" to "aquatic and wildlife (cold water)." The purpose of this change is to clarify that the A&Wc designated use applies to surface waters that support fish populations and those that do not support fish populations. The proposed rule defines "aquatic and wildlife (cold water)" as follows:

"Aquatic and wildlife (cold water)" means the use of a surface water by animals, plants, or other cold water organisms, generally occurring at elevations greater than 5000 feet for habitation, growth, or propagation.

ADEQ proposes similar changes to the definition of the "aquatic and wildlife (warm water fishery) designated use. ADEQ proposes to change the name of the designated use to "aquatic and wildlife (warm water)" to clarify that the designated use is not limited to surface waters that support fisheries. The designated use also applies to surface waters that do not support fish populations. ADEQ proposes to define "aquatic and wildlife (warm water)" as follows:

"Aquatic and wildlife (warm water)" means the use of a surface water by animals, plants, or other warm water organisms, generally occurring at elevations less than 5000 feet for habitation, growth, or propagation.

b. Revision of the definition of "effluent dependent water"

ADEQ proposes to change the definition of "effluent dependent water" (EDW) at R18-11-101(21). The current definition states that an EDW is "a surface water that consists *primarily* of discharges of treated wastewater which has been classified as an effluent dependent water by the Director under R18-11-113." The word, "primarily," in this definition is vague. It is not clear from the definition whether a surface water can be classified as an EDW if more than 50% of the flow in a surface water consists of treated wastewater (that is, the flow consists *primarily* of discharges of treated wastewater). ADEQ proposes to revise the definition of "effluent dependent water" to clarify that an EDW is a surface water whose flow consists of treated wastewater and sometimes storm water. Under the proposed definition, an EDW is defined as an ephemeral water that contains flow because of the discharge of treated wastewater. An EDW also may contain flow from storm water runoff that is in direct response to precipitation.

ADEQ wants to clarify that a low flow perennial surface water with an existing A&Wc or A&Ww aquatic life designated use cannot be classified as A&Wedw through the EDW classification process. A wastewater treatment plant that discharges treated wastewater to a perennial surface water with an A&Wc or A&Ww designated use must comply with the applicable water quality standards that apply to the receiving water, even where the resulting flow in the receiving surface water consists "primarily" of treated wastewater. ADEQ wants to clarify that a surface water can be classified as an EDW only when the receiving surface water is an ephemeral water in the absence of the discharge of treated wastewater. ADEQ proposes to define "effluent dependent water" as follows:

21. “Effluent dependent water” means a surface water that consists ~~primarily~~ of discharges of treated wastewater ~~which has been 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 discharge of treated wastewater, would be an ephemeral water.

c. Addition of definitions for “perennial surface water” and “intermittent surface water”

ADEQ proposes to add definitions for “perennial surface water” and “intermittent surface water.” ADEQ proposes to add new definitions for these terms to support proposed revisions to the tributary rule and to distinguish intermittent waters from ephemeral waters. As discussed elsewhere in this preamble, ADEQ is considering revisions to the tributary rule at R18-11-105 to establish water quality standards for unlisted tributaries depending on whether they are: 1) ephemeral waters, 2) perennial and intermittent surface waters that are above 5000 feet in elevation, or 3) perennial and intermittent surface waters that are below 5000 feet in elevation. New definitions for “perennial surface water” and “intermittent surface water” will clarify the scope of the proposed revisions to the tributary rule and make them more understandable.

ADEQ proposes to define “perennial surface water” as “a surface water that flows continuously throughout the year.” This definition is based upon the generally accepted hydrologic definition of “perennial stream” found in standard references such as: Bates, Robert L. And Jackson, Julia A., Editors, Glossary of Geology, Third Edition, American Geological Institute, Alexandria, Virginia, 1987, p. 492 and W.B. Langbein and Kathleen T. Iseri, “General Introduction and Hydrologic Definitions,” Manual of Hydrology: Part I. General Surface-Water Techniques, Geological Survey Water Supply Paper 1541-A, United States Government Printing Office, Washington, D.C. (1960), p. 18.

ADEQ proposes to define “intermittent surface water” as a surface water that flows continuously for 30 days or more at times of the year when it receives water from springs or from a surface source such as melting snow. An intermittent surface water is different from an ephemeral water. An ephemeral water flows only in direct response to precipitation (that is, direct storm water runoff) for short periods of time. An intermittent water may flow seasonally for longer periods of time (30 days or more). The distinction between ephemeral waters and intermittent waters is important because the proposed tributary rule assigns different aquatic life designated uses to ephemeral waters and intermittent surface waters. An intermittent surface water has either an A&Wc or A&Ww designated use with acute and chronic toxicity criteria to protect aquatic life. An intermittent water has the same aquatic life designated uses as a perennial surface water. Ephemeral waters are protected by a subcategory of the aquatic life designated use that is specifically tailored for ephemeral waters. The aquatic and wildlife (ephemeral) designated use does not include chronic toxicity criteria because of the short duration of flow in an ephemeral water.

d. Amendment of the definition of “ephemeral water”

The current surface water quality standards rules define “ephemeral water” as a “surface water that has a channel that is at all times above the water table, that flows only in direct response to precipitation, and that does not support a self-sustaining fish population” [See R18-11-101(22)]. This definition is inconsistent with generally accepted hydrological definitions of “ephemeral water” found in reference texts such as the Glossary of Geology and the USGS Manual of Hydrology cited above. The standard definitions of “ephemeral water” do not include a biological element that refers to the non-support of a self-sustaining fish population. The reference texts define “ephemeral water” as a surface water that flows only in direct response to precipitation and whose channel is at all times above the water table. The term is sometimes restricted to mean a stream that does not flow during periods of as much as 30 days. Ephemeral waters are distinguished from intermittent waters because an intermittent water is a surface water that flows continuously for 30 days or more at times of the year when it receives water from springs or from another surface source such as melting snow. ADEQ proposes to repeal the biological element in the current definition of “ephemeral water” that refers to fish populations to make the definition more concise and more consistent with the generally accepted hydrological definition of “ephemeral water.” The amended definition of “ephemeral water” in the proposed rule states:

22. “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 ~~and that does not support a self-sustaining fish population.~~

e. Addition of a definition for “pollutant.”

The word, “pollutant,” is used in several places in the current surface water quality standards rules but it is not defined in the rules. For example, the current antidegradation rule states at R18-11-107(A) that ADEQ shall determine whether there is degradation of surface water quality on a “pollutant by pollutant” basis. The narrative standards rule states at R18-11-108(A) that a surface water shall be free from pollutants in amounts or combinations that cause various effects [See R18-11-108(A)(1-8)]. A definition of “pollutant” will clarify the rules where “pollutant” is used and make the rules more understandable.

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The statutory definition of “pollutant” at A.R.S. § 49-201(26) is broadly inclusive and it goes beyond chemical pollutants. In particular, the statutory definition clearly includes rock, sand, and dirt as “pollutants.” The inclusion of rock, sand, and dirt in the statutory definition of “pollutant” is important because it clarifies that sediment in a surface water is a pollutant. ADEQ proposes to include the definition of “pollutant” that is prescribed in Arizona’s Water Quality Control statutes in the surface water quality standards rules. A.R.S. § 49-201(26) defines “pollutant” as follows:

“Pollutant” means fluids, contaminants, toxic wastes, toxic pollutants, dredged spoil, solid waste, substances and chemicals, pesticides, herbicides, fertilizers and other agricultural chemicals, incinerator residue, sewage, garbage, sewage sludge, munitions, petroleum products, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and mining, industrial, municipal and agricultural wastes or any other liquid, solid, gaseous, or hazardous substance.

Applicability [R18-11-102]

The water quality standards in Title 18, Chapter 11, Article 1 of the Arizona Administrative Code apply to surface waters in Arizona [See R18-11-102(A)]. In general, “surface water” includes Arizona’s rivers, streams, and lakes. The term, “surface water,” has a specific legal definition for purposes of the water quality standards program [See R18-11-101(40)]. “Surface water,” as used in the surface water quality standards rules, has the same meaning as the terms, “navigable water” and “water of the United States,” as those terms are used in the Clean Water Act and its implementing federal regulations.

§303(c) of the Clean Water Act requires states to adopt water quality standards for “navigable waters.” The Clean Water Act defines “navigable waters” as the “waters of the United States” [See §502(7) of the Clean Water Act]. Congress did not define “waters of the United States” in the Clean Water Act. However, EPA defined “waters of the United States” in federal regulations that implement the Act, such as the federal regulations that govern the NPDES permit program [See 40 CFR §122.2].

Under 40 CFR §122.2, “waters of the United States” means:

- a. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- b. All interstate waters, including interstate “wetlands;”
- c. All other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, or playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including any such waters:
 1. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 2. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 3. Which are used or could be used for industrial purposes by industries in interstate commerce;
- d. All impoundments of waters otherwise defined as waters of the United States under this definition;
- e. Tributaries of waters identified in paragraphs (a) through (d) of this definition;
- f. The territorial sea; and
- g. “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition [See 40 CFR §122.2].

ADEQ modeled the state’s definition of “surface water” on the above definition. The federal definition of “waters of the United States” in 40 CFR §122.2 is essentially the same as the state’s definition of “surface water.” ADEQ defines “surface water” at R18-11-101(40) as follows:

“Surface water” means a water of the United States and includes the following:

- a. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce;
- b. All interstate waters, including interstate wetlands;

- c. All other waters, such as intrastate lakes, reservoirs, natural ponds, rivers, streams (including intermittent and ephemeral streams), creeks, washes, draws, mudflats, sandflats, wetlands, sloughs, backwaters, prairie potholes, wet meadows, or playa lakes, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including any such waters:
 - i. Which are 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. Which are used or could be used for industrial purposes by industries in interstate commerce;
- d. All impoundments of waters otherwise defined as surface waters under this definition;
- e. Tributaries of surface waters identified in paragraphs (a) through (d) of this definition; and
- f. Wetlands adjacent to surface waters identified in paragraphs (a) through (e) of this definition.

There are minor differences between the federal definition of “waters of the United States” and ADEQ’s definition of “surface water” [*Compare* 40 CFR §122.2 and R18-11-101(40) above]. First, ADEQ’s definition of “surface water” does not include references to the territorial sea or to waters that are subject to the ebb and flow of the tide because Arizona is an inland state and such references are unnecessary. Second, ADEQ’s definition of “surface water” includes examples of intrastate waters that are found in Arizona but are not included as examples in the federal definition of “waters of the United States.” For example, the ADEQ definition of “surface water” includes reservoirs, creeks, ephemeral waters, washes, draws, and backwaters as examples of intrastate waters. These examples are not found in 40 CFR §122.2.

The applicability rule includes two exclusions. Surface water quality standards do not apply to waste treatment systems or to man-made surface impoundments and associated ditches and conveyances that are used in the extraction, beneficiation, and processing of metallic ores under certain conditions [*See* R18-11-102(B)]. ADEQ proposes no changes to either exclusion in this triennial review.

Designated uses [R18-11-104]

§303(c)(2)(A) of the Clean Water Act defines a water quality standard as the designated uses of a surface water and the water quality criteria necessary to support the designated uses. A designated use is one of the two essential elements of a water quality standard. Arizona’s numeric surface water quality standards are expressed in terms of the maintenance and protection of designated uses.

As noted previously, §303 of the Clean Water Act requires states to adopt water quality standards to protect public health or welfare, enhance the quality of water, and “serve the purposes of the Clean Water Act.” 40 CFR §131.2 and §2.1 of the *Water Quality Standards Handbook, 2nd Edition* (p. 2-1) provide guidance on what is meant by the phrase, “serve the purposes of the Clean Water Act.” According to the *Water Quality Standards Handbook*, “serve the purposes of the Act” means that the surface water quality standards should:

- Provide, wherever attainable, water quality for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water (to implement the “fishable / swimmable” goal of the Act), and
- Consider the use and value of state waters for public water supplies, propagation of fish and wildlife, recreation, agriculture, and industrial purposes, including navigation.

§303 of the Clean Water Act and a similar Arizona statute, § 49-222(A), describe the types of uses of surface waters that must be protected by water quality standards. These uses are called “designated uses.” The Clean Water Act requirements for designated uses are stated in the federal water quality standards regulations at 40 CFR §131.10 (a):

Each state must specify appropriate water uses to be achieved and protected. The classification of the waters of the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish, and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States.

ADEQ has discretion to adopt a designated use classification scheme appropriate for surface waters in Arizona. However, ADEQ must adopt designated uses that are consistent with the Clean Water Act and the statutory guidelines prescribed in A.R.S. § 49-221 and § 49-222. This means that ADEQ must establish water quality standards that provide water quality for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water where those uses are attainable to be consistent with the “fishable, swimmable” goal of the Clean Water Act. ADEQ also must consider the types of uses described in the Clean Water Act and the Arizona statutes when establishing designated uses for surface waters in Arizona. ADEQ is free to add other designated uses to the state water quality standards except for waste assimilation or transport.

ADEQ has established the following designated uses for surface waters in Arizona:

- Domestic water source (DWS)
- Full body contact recreation (FBC)
- Partial body contact recreation (PBC)
- Fish consumption (FC)
- Agricultural irrigation (AgI)
- Agricultural livestock watering (AgL)
- Aquatic life and wildlife (cold water) (A&Wc)
- Aquatic life and wildlife (warm water) (A&Ww)
- Aquatic life and wildlife (effluent dependent water) (A&Wedw)
- Aquatic life and wildlife (ephemeral water) (A&We)

Arizona’s “menu” of designated uses is listed in R18-11-104(B). Designated uses for specific surface waters are listed in Appendix B of the surface water quality standards rules. The state’s current designated use classification system “serves the purposes of the Clean Water Act” because it provides for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water.

A state may adopt subcategories of a use and set appropriate criteria to meet the water quality requirements for each subcategory [*See* 40 CFR §131.10(c)]. ADEQ established 4 subcategories of designated uses to protect fish, shellfish, and wildlife (A&Wc, A&Ww, A&Wedw, and A&We). Every surface water in Arizona, with the exception of certain canals, has one of 4 designated uses to protect aquatic life and wildlife.

ADEQ protects water quality for “recreation in and on the water” with the full body contact recreation (FBC), partial body contact recreation (PBC), and fish consumption (FC) designated uses. These designated uses are intended to maintain and protect water quality for swimming, water-skiing, boating, wading, fishing, and other recreational uses. The FBC designated use is intended to protect public health when people engage in recreational activities that may involve full immersion in the water and potential ingestion of the water such as swimming. The PBC designated use is intended to protect public health when people engage in water-based recreational activities where full immersion and ingestion of the water are unlikely such as wading or boating. The FC designated use is intended to protect human health when fish or other aquatic organisms are taken from a surface water for human consumption.

ADEQ has considered the use and value of surface waters for public water supply by establishing the domestic water source (DWS) designated use. The DWS designated use applies to a surface water that is used as a raw water source for drinking water supply. The water quality criteria for the DWS designated use were developed assuming that treatment may be necessary to yield drinking water suitable for human consumption. The DWS designated use applies to a surface water that has a water treatment plant located along it which uses the surface water as a raw water source.

Finally, ADEQ recognizes the use and value of surface waters for agricultural purposes by establishing the agricultural irrigation (AgI) and agricultural livestock watering (AgL) designated uses. These uses are intended to maintain and protect surface water quality so water can be used for crop irrigation or to water cattle and other livestock.

Use attainability

In each triennial review, ADEQ considers appropriate revisions to the designated uses of the state's surface waters. The Clean Water Act and its implementing regulations require that ADEQ review the designated uses of the state's surface waters to determine whether the uses that are specified in §101(a)(2) of the Clean Water Act (that is, uses related to the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water) are attainable. The *Water Quality Standards Handbook, 2nd Edition* and 40 CFR §131.10(d) both define "attainable uses" as uses that can be achieved by imposition of effluent limits required under §§301(b)(1)(A) and (B) and §306 on point source dischargers and implementation of cost-effective and reasonable best management practices for non-point source pollution control.

Federal law requires that ADEQ re-examine each surface water with surface water quality standards that do not include the uses specified in §101(a)(2) of the Clean Water Act each triennial review to determine if there is new information indicating that the uses specified in §101(a)(2) are attainable. If "fishable, swimmable" uses are attainable in a surface water, ADEQ must revise the state-adopted water quality standards accordingly [See 40 CFR §131.20(a)].

ADEQ interprets the uses that are specified in §101(a)(2) of the Clean Water Act to include one of the state's 4 aquatic life use subcategories (A&Wc, A&Ww, A&Wedw, or A&We), the full body contact recreation (FBC), and the fish consumption (FC) designated uses. Therefore, ADEQ must review each surface water listed in Appendix B of the surface water quality standards rules each triennial review and re-examine surface waters that do not include the FBC, FC, and an A&W designated use. Under 40 CFR §131.10(j), ADEQ must conduct a use attainability analysis (UAA) to justify the omission of one of these designated uses. EPA has stated in the preamble to the federal water quality standards regulations that a state need only conduct a UAA once for a given water body and a set of designated uses [48 Federal Register, 51,400, 51,409 (November 8, 1983)]. During subsequent triennial reviews, a state is required only to review the bases for not including a use that is specified in §101(a)(2) of the Clean Water Act to show that circumstances have not changed and that the FBC, FC, or A&W designated use remains unattainable.

There are 6 grounds that can be used to demonstrate that attaining a designated use is not feasible. The 6 grounds are prescribed in 40 CFR §131.10(g) and R18-11-104 (H)(1-6). They are:

1. Naturally occurring pollutant concentrations prevent the attainment of the use;
2. Natural, ephemeral, intermittent, or low flow conditions prevent the attainment of the use;
3. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.
4. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use;
5. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life designated uses; or
6. Controls more stringent than those required by §301(b) and §306 of the Clean Water Act are necessary to attain the use and implementation of such controls would result in substantial and widespread economic and social impact.

When ADEQ conducts a triennial review of the state's surface water quality standards rules, ADEQ must evaluate what uses are being attained in surface waters. If a surface water is designated for a use that requires less stringent criteria than a use that is being attained, ADEQ must revise the designated uses to include the use that is actually being attained. For example, if a surface water has a PBC designated use but it is actually used for full body contact recreation or the existing water quality in the surface water meets FBC water quality standards, then ADEQ must revise the list of designated uses for that surface water to include the FBC designated use.

ADEQ Review of Surface Waters in Appendix B That Lack a Full Body Contact Recreation Designated Use.

Every surface water in Arizona, with the exception of certain canals, has either a full body contact recreation (FBC) or a partial body contact recreation (PBC) designated use. ADEQ interprets the Clean Water Act and the federal water quality standards regulations as requiring a review of each surface water with a PBC designated use to determine if the FBC designated use is attainable.

The large majority of surface waters with a PBC designated use are identified as ephemeral waters, effluent dependent waters, or municipal park lakes. In 1996, ADEQ prepared use attainability analyses [UAAs] to justify the omission of the FBC designated use for ephemeral and effluent dependent waters. These UAAs were approved by EPA. EPA has stated in the preamble to the federal water quality standards regulation that a state need only conduct a UAA once for a given water body and a set of designated uses [48 Federal Register, 51,400, 51,409 (November 8, 1983)]. During subsequent triennial reviews, a state is required only to review the bases for not including a use that is specified in §101(a)(2) of the Clean Water Act to show that circumstances have not changed and that the FBC designated use remains unattainable. ADEQ will rely on the previously submitted UAAs for ephemeral and effluent dependent waters to justify the omission of the FBC designated use because circumstances have not changed and the FBC designated use remains unattainable in both ephemeral and effluent dependent waters.

ADEQ will review the following surface waters in this triennial review to determine if there is any new information warranting a change in the water quality standards and which indicates that FBC is an attainable use:

1. Dry Lake in the Little Colorado River basin is currently classified as an EDW but it does not have a PBC or a FBC designated use.
2. Indian Bend Wash in the Middle Gila River basin has the A&Ww and PBC designated uses. The PBC designated use may be appropriate for Indian Bend Wash because it is an ephemeral water.
3. Mule Gulch in the Rios de Mexico basin, from the headwaters to the Bisbee WWTP outfall is identified as having the A&Ww and PBC designated uses. Again, the PBC designated use may be appropriate for portions of Mule Gulch because they may be ephemeral.
4. Salt River, in the Salt River basin, from the I-10 bridge to the 23rd Avenue WWTP outfall is identified as A&Ww with a PBC designated use. ADEQ will review the bases for both the A&Ww and PBC designated uses for this reach of the Salt River.
6. Bitter Creek, a tributary to the Gila River, has the A&Ww and PBC designated uses. ADEQ will review this surface water to determine whether the FBC designated use is an attainable use.
7. Bitter Creek, in the Verde River basin, from the headwaters to the Jerome WWTP outfall discharge has the A&Ww and PBC designated uses. ADEQ will review this surface water to determine whether the FBC designated use is an attainable use.

ADEQ Review of Surface Waters That Lack a Fish Consumption Designated Use

As noted above, ADEQ interprets the uses that are specified in §101(a)(2) of the Clean Water Act to include the fish consumption (FC) designated use. The FC designated use is one that ADEQ interprets to be within the meaning of the phrase, "recreation in and on the water." In each triennial review, ADEQ must review each surface water that does not include the FC designated use to determine whether the FC designated use is attainable. ADEQ must justify the omission of the FC designated use for a surface water with a use attainability analysis (UAA).

With one exception, the FC designated use has been established for every perennial surface water in Arizona that currently has either an aquatic and wildlife (cold water fishery) or aquatic and wildlife (warm water fishery) designated use. The one exception is Nogales Wash. Nogales Wash has an aquatic and wildlife (warm water fishery) designated use but it does not have a FC designated use. In 1996, ADEQ prepared a UAA to justify the omission of the FC designated use in Nogales Wash [See "Fish Consumption in Nogales Wash: Use Attainability Analysis (April 3, 1996)"]. This UAA was based on the following grounds: 1) natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the FC designated use, and 2) human-caused conditions or sources of pollutants prevent the attainment of FC designated use and cannot be remedied or would cause more environmental damage to correct than to leave in place. Circumstances have not changed in Nogales Wash and ADEQ will resubmit the 1996 UAA to justify the omission of the FC designated use in Nogales Wash in this triennial review.

Fish consumption has not been established as a designated use for surface waters that fall into two general categories: 1) ephemeral waters, and 2) effluent dependent waters. ADEQ prepared UAAs in the 1996 triennial review to justify the omission of the FC designated use in ephemeral waters and effluent dependent waters [See "Use Attainability Analyses: Non-Attainment of Full Body Contact for Surface Waters and Non-Attainment of Fish Consumption for Ephemeral Waters" (March 17, 1997) and "Fish Consumption in Effluent-Dependent Waters: Use Attainability Analysis (April 3, 1996)"]. Again, circumstances have not changed for these categories of surface waters and ADEQ will resubmit the UAAs that were previously prepared to justify the omission of the FC designated use in ephemeral waters and EDWs.

Finally, fish consumption has not been established as a designated use for the canals that are listed in the surface water quality standards. The few canal systems that are listed in the surface water quality standards rules are man-made conveyances for the transportation of surface water for domestic water supply and agricultural uses. Fishing is prohibited on the listed canal systems. Consequently, fish consumption is not an existing use. ADEQ will not propose fish consumption as a designated use for canals in this triennial review.

ADEQ Review of Surface Waters That Lack an Aquatic and Wildlife Designated Use

Every surface water that is listed in Appendix B of the surface water quality standards rules, with the exception of certain canals, has an aquatic life designated use. Thus, the large majority of Arizona surface waters do not lack an aquatic life designated use and they do not have to be re-examined in this triennial review to determine if a designated use related to the protection and propagation of fish, shellfish, and wildlife is attainable.

ADEQ does not intend to propose an aquatic life designated use for canals in this triennial review. Again, as noted above, the few canal systems that are listed in the surface water quality standards rules are manmade conveyances for the transportation of surface water for domestic water supply and agricultural uses. Human-caused conditions prevent the attainment of an aquatic life use in the listed canals.

Proposed Revisions of the Aquatic and Wildlife (Cold Water Fishery) and Aquatic and Wildlife (Warm Water Fishery) Designated Uses

As discussed previously in the definition section of this preamble, ADEQ proposes to revise the current definitions of the aquatic and wildlife (cold water fishery) and aquatic and wildlife (warm water fishery) designated uses. Currently, these two designated uses are defined by references to the presence or absence of salmonid species in a surface water. “Aquatic and wildlife (cold water fishery)” means “the use of a surface water by animals, plants, or other organisms, *including salmonids*, for habitation, growth, or propagation” [See R18-11-101(7)]. “Aquatic and wildlife (warm water fishery)” means “the use of a surface water by animals, plants, or other organisms, *excluding salmonids*, for habitation, growth, or propagation [See R18-11-101(10)].

The references to “fishery” in the A&Wc and A&Ww designated uses are misnomers. The current names of the two designated uses suggest that the water quality standards are intended to apply only to surface waters that actually support fisheries. However, the current definitions of the A&Wc and A&Ww designated uses clearly indicate that the designated uses are intended to have broader application. The A&Wc and A&Ww designated uses are defined in terms of the protection of “animals, plants, or other organisms” and they are not limited to the protection of fish species. The A&Wc and A&Ww designated uses are meant to maintain and protect water quality for aquatic life. Both designated uses apply to surface waters that support fisheries and those that do not have fish. For example, there may be cold or warm water streams that support a diverse assemblage of macroinvertebrates, aquatic plants, and other organisms but they do not support fish species. The A&Wc and A&Ww designated uses are intended to apply to such surface waters. ADEQ proposes to revise the names of the two designated uses by deleting the reference to “fishery” in each one. The new names of the designated uses in the proposed rule are: “aquatic and wildlife (cold water)” and “aquatic and wildlife (warm water).”

ADEQ also proposes to revise the current definitions of the A&Wc and A&Ww designated uses to repeal references to the presence or absence of salmonids. ADEQ proposes to define the A&Wc and A&Ww designated uses using the macroinvertebrate communities that each type of surface water supports. ADEQ research on the distribution of macroinvertebrate communities in streams in Arizona indicates that macroinvertebrate communities are a better way to define the A&Wc and A&Ww designated uses. Macroinvertebrate communities are a better way to define the A&Wc and A&Ww designated uses for two reasons. First, virtually all surface waters contain macroinvertebrates. The problem with using the presence or absence of salmonids as the way to define the A&Wc and A&Ww designated uses is that some Arizona surface waters may not contain fish populations or there is little or no data on the presence or absence of salmonids in a surface water to make a reliable determination as to which designated use applies. The lack of data on the presence or absence of salmonids makes it difficult to determine which designated use should apply without conducting an actual field investigation of a surface water. Second, ADEQ has acquired data on the distribution of macroinvertebrates in surface waters statewide through its biocriteria program [See Spindler, Patti, "Macroinvertebrate Community Distribution Among Reference Sites in Arizona," Arizona Department of Environmental Quality, October, 2000]. The data from this study show that there are two broad macroinvertebrate community types in Arizona: cold water and warm water macroinvertebrate communities. ADEQ has found through statistical analyses of the macroinvertebrate data that elevation was consistently identified as the most important environmental variable explaining the distribution of the two community types. Cold water macroinvertebrate communities are generally found at elevations greater than 5000 feet and warm water macroinvertebrate communities are generally found at elevations less than 5000 feet. The data indicate that the 5000 foot elevation contour can be used as a predictive model to determine whether A&Wc or A&Ww should apply to a surface water. ADEQ believes that the use of macroinvertebrate community types and the 5000 foot contour is a more reliable and scientifically defensible way to determine which aquatic life designated use applies to a surface water.

ADEQ proposes to revise the listings of surface waters that are currently classified as A&Wc and A&Ww based upon whether a surface water is above or below 5000 feet in elevation. ADEQ proposes to classify reaches of perennial surface waters that are above 5000 feet as A&Wc and those that are below 5000 feet in elevation as A&Ww. The use of the 5000 foot elevation contour will result in changes to the current designated uses for some surface waters in each watershed. In some cases, ADEQ proposes to segment surface waters with upper reaches that start above 5000 feet and lower reaches that terminate below 5000 feet in elevation. ADEQ recognizes that there may be exceptions to the use of the 5000 foot contour to assign A&Wc and A&Ww designated uses. For example, there may be streams located below 5000 feet that are affected by hypolimnetic releases of very cold water from dams (e.g., Colorado River below Glen Canyon Dam). Also, the use of the 5000 foot contour does not apply to the assignment of aquatic life uses to lakes and reservoirs. ADEQ does not propose to change the current aquatic life designated uses for lakes and reservoirs in this triennial review. A complete listing of proposed changes to the A&Wc and A&Ww designated uses is shown in Appendix B.

Changes to the tributary rule [R18-11-105]

R18-11-105 is commonly called "the tributary rule." The tributary rule establishes water quality standards for surface waters that are not listed in Appendix B of the surface water quality standards rules. The intent of the rule is to provide a minimum level of water quality protection for all surface waters in Arizona, including the surface waters that are not specifically identified in Appendix B of the rules. The tributary rule accomplishes this by prescribing designated uses and establishing default water quality standards for certain categories of surface waters.

The current tributary rule establishes water quality standards for 4 different types of tributaries: 1) ephemeral waters, 2) effluent dependent waters (EDWs), 3) tributaries that are neither ephemeral or EDWs and that have salmonids present, and 4) tributaries that are neither ephemeral or EDWs and that do not have salmonids present. Under the current rule, unlisted tributaries that are ephemeral waters are protected by the water quality standards for aquatic and wildlife (ephemeral) and partial body contact recreation. The aquatic and wildlife (edw) and partial body contact water quality standards apply to unlisted tributaries that are EDWs. Tributaries that are neither ephemeral waters or EDWs and that have salmonids present are protected by aquatic and wildlife (cold water fishery), fish consumption, and the water quality standards that apply to the nearest downstream surface water that is neither an ephemeral water or an EDW. Tributaries that are neither an ephemeral water or an EDW that do not have salmonids present are protected by aquatic and wildlife (warm water fishery) standards, fish consumption standards, and the water quality standards that apply to the nearest downstream surface water listed in Appendix B that is neither an ephemeral water or an EDW.

The current tributary rule needs to be revised for several reasons. First, the rule includes a provision that assigns water quality standards to “an unlisted tributary that is an effluent dependent water” [See R18-11-105 (2)]. This part of the tributary rule is inconsistent with R18-11-113, the rule that specifically addresses EDWs. Under R18-11-113, the only way that a surface water can be recognized as an EDW is when ADEQ promulgates a rule to classify the surface water as an EDW. Consequently, all EDWs in Arizona are specifically listed in R18-11-113(D) and in Appendix B of the surface water quality standards rules. It is impossible for there to be an *unlisted* tributary that is an EDW. Thus, the part of the tributary rule that addresses unlisted tributaries that are EDWs has no practical application. ADEQ proposes to correct this problem by repealing R18-11-105 (2).

Second, the current tributary rule defines two categories of tributaries by the presence or absence of salmonid species [See R18-11-105 (3) and (4)]. These subsections of the tributary rule are consistent with the way that ADEQ currently defines the aquatic and wildlife (cold water fishery) and aquatic and wildlife (warm water fishery) designated uses in the surface water quality standards rules. As noted above, ADEQ proposes to revise the names and definitions of the A&Wc and A&Ww designated uses in this triennial review. ADEQ also proposes to revise the tributary rule to conform it to the proposed changes in the definitions of the A&Wc and A&Ww designated uses. The proposed tributary rule assigns designated uses to unlisted tributaries depending on whether they are ephemeral, intermittent, or perennial streams and whether they are above or below 5000 feet in elevation. The aquatic and wildlife (ephemeral) and partial body contact designated uses apply to unlisted tributaries that are ephemeral waters under the proposed rule. Unlisted tributaries that are intermittent or perennial and above 5000 feet in elevation are assigned the aquatic and wildlife (cold water), full body contact recreation, and fish consumption water quality standards. Unlisted tributaries that are intermittent or perennial and are below 5000 feet in elevation are assigned the aquatic and wildlife (warm water), full body contact recreation, and fish consumption standards. The proposed assignment of the FBC, FC, and the A&Wc or A&Ww designated uses to unlisted tributaries that are perennial or intermittent is consistent with the way that designated uses are currently assigned to perennial and intermittent surface waters listed in Appendix B. Also, this approach is consistent with the “fishable / swimmable” goals of the Clean Water Act.

Finally, the current tributary rule assigns designated uses from the “...nearest downstream surface water listed in Appendix B that is not an ephemeral water or effluent dependent water” to unlisted tributaries that are neither ephemeral waters or EDWs [See R18-11-105(3) and (4)]. The intent of this rule is to ensure compliance with surface water quality standards that apply to the nearest downstream, perennial surface water. ADEQ is concerned that implementation of this part of the current tributary rule more frequently results in the establishment of inappropriate designated uses for upstream tributaries. In many cases, the nearest downstream, perennial surface water is separated from an unlisted tributary by long stream reaches that are ephemeral waters. Often, the assignment of designated uses such as the domestic water source, agricultural irrigation, or agricultural livestock watering to an unlisted tributary is inappropriate because they are not existing uses of the unlisted tributary. Also, the assignment of designated uses to an unlisted tributary is usually unnecessary to maintain and protect water quality in the downstream, perennial surface water because, in most cases, the unlisted tributary and the nearest downstream, perennial surface water are spatially interrupted. Finally, the assignment of “fishable, swimmable” designated uses to unlisted tributaries that are perennial or intermittent through the proposed tributary rule will: 1) provide a high level of water quality protection to the unlisted tributaries, and 2) ensure that water quality in a downstream perennial surface water is maintained and protected.

Revisions to the Antidegradation Rule [R18-11-107]

Arizona’s surface water quality standards rules must include an antidegradation policy that is consistent with the federal antidegradation policy prescribed in 40 CFR §131.12. Arizona’s antidegradation rule is R18-11-107 and its language closely parallels the language of 40 CFR §131.12. The antidegradation requirement is based upon the primary objective of the Clean Water Act stated in §101(a)(2) to “...restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” The degradation of surface water quality is antithetical to this primary objective. The antidegradation concept was specifically included in the text of the Clean Water Act in 1987 in an amendment to §303(d)(4)(B). §303(d)(4)(B) requires satisfaction of antidegradation requirements before certain changes in NPDES permits can be made.

Under 40 CFR §131.12(a), each state must develop and adopt a statewide antidegradation policy and identify methods for implementing that policy. At a minimum, the state’s antidegradation policy must be consistent with the following:

- Existing instream water uses and the level of water quality necessary to protect existing uses must be maintained and protected [See 40 CFR §131.12(a)(1)].

- Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the state finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the state's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the state shall assure water quality adequate to protect existing uses fully. Further, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control [See 40 CFR §131.12(a)(2)].
- Where high quality waters constitute an outstanding national resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected [See 40 CFR §131.12(a)(3)].
- In those cases where potential water quality impairment associated with a thermal discharge is involved, the anti-degradation policy and implementing method shall be consistent with §316 of the Clean Water Act [See 40 CFR §131.12(a)(4)].

The state's current antidegradation rule, R18-11-107, satisfies the federal requirement that ADEQ adopt a statewide antidegradation policy consistent with the federal antidegradation policy prescribed in 40 CFR §131.12. Both the federal and state antidegradation rules establish a three-tiered approach to maintaining and protecting levels of water quality and the uses of surface waters. Tier 1 establishes the "floor" of water quality protection for surface waters in Arizona. At a minimum, existing uses and the level of water quality necessary to protect existing uses must be maintained and protected. Tier 2 provides for the protection of existing water quality in high quality surface waters or, those surface waters where water quality is better than the levels necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water. There are provisions in both the federal and state antidegradation rules that allow limited water quality degradation to occur in a Tier 2 surface water provided there is adequate public participation in the decision-making process and water quality is not degraded to a point where a surface water is no longer "fishable, swimmable." Tier 3 of the federal antidegradation rule provides special water quality protection to surface waters that are classified as outstanding national resource waters. In Arizona, outstanding national resource waters are called unique waters. The federal and state Tier 3 antidegradation rules both require the maintenance and protection of existing water quality in an outstanding national resource water or a unique water. Limited activities which result in short-term or temporary changes in water quality are allowable but long-term degradation of existing water quality in a unique water is prohibited. Finally, both the federal and state antidegradation rules have the same language addressing thermal discharges.

There are a few non-substantive differences between the language of 40 CFR §131.12 and the language of R18-11-107. First, the state antidegradation rule includes an introductory section that clarifies that ADEQ shall determine whether there is degradation of water quality in a surface water on a "pollutant by pollutant" basis [See R18-11-107(A)]. The "pollutant by pollutant" language is not found in the federal antidegradation policy. [Compare 40 CFR §131.12 and R18-11-107]. Its inclusion in the state rule reflects ADEQ's understanding of current EPA guidance on how the antidegradation policy should be implemented. ADEQ conducts antidegradation reviews on a pollutant-by-pollutant basis. Thus, a surface water may be considered a Tier 1 waterbody for one pollutant and a Tier 2 waterbody for another pollutant.

ADEQ's inclusion of the "pollutant by pollutant" language in R18-11-107(A) may have created some misunderstanding in the regulated community that antidegradation reviews are strictly limited to a review of whether degradation by chemical pollutants will occur. While ADEQ does not propose to change the language of R18-11-107(A) in this triennial review, ADEQ wants to clarify that antidegradation determinations are *not* strictly limited to degradation by chemical pollutants only. For example, degradation of water quality in a surface water may occur because of total suspended solids or bottom deposits [i.e. siltation or excessive sedimentation]. The degradation of surface water quality also may be demonstrated by an increase in toxicity as demonstrated by ambient toxicity tests upstream and downstream of a point source discharge. In the latter example, it may not be possible to identify a specific chemical pollutant causing the toxicity through toxicity identification procedures. However, the toxicity test results by themselves could be used to establish that degradation was occurring in a surface water.

Second, the state antidegradation rule includes specific references to surface water quality standards that are not found in 40 CFR §131.12. The federal Tier 1 antidegradation policy states at 40 CFR §131.12(a)(1) that “[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” Arizona’s Tier 1 antidegradation policy is expressed differently, but it is intended to provide the same level of water quality protection as the federal Tier 1 regulation. Like the federal regulation, R18-11-107(B) states: “The level of water quality necessary to protect existing uses shall be maintained and protected.” However, R18-11-107(B) goes on to clarify that this baseline level of water quality is defined by reference to the surface water quality standards. R18-11-107(B) states that “[n]o degradation of existing water quality is permitted in a surface water where the existing water quality does not meet the applicable water quality standard.” In other words, the surface water quality standards define the level of water quality necessary to protect existing uses. This clarifying reference to the surface water quality standards is not found in the federal Tier 1 antidegradation policy. Under the Tier 1 policy, existing water quality establishes the water quality “floor” that must be maintained in an impaired surface water when a surface water quality standard is not met. No further degradation of existing water quality with respect to that pollutant is allowed in an impaired surface water.

Third, Arizona’s Tier 2 antidegradation rule uses different language from the Tier 2 language found in 40 CFR §131.12(a)(2). Again, both rules are intended to accomplish the same purpose. The federal Tier 2 antidegradation policy is intended to protect existing water quality in high quality surface waters. 40 CFR §131.12(a)(2) states that “[w]here the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected....” R18-11-107(C) prescribes Arizona’s Tier 2 antidegradation policy for high quality surface waters. R18-11-107(C) provides the same level of antidegradation protection as the federal antidegradation policy, but the state rule expresses the Tier 2 antidegradation policy in terms of existing water quality that is better than applicable surface water quality standards. R18-11-107(C) states that “[w]here existing water quality in a surface water is *better than the applicable water quality standard*, the existing water quality shall be maintained and protected.” In both the federal and state antidegradation policies, the existing high quality of a surface water must be maintained and protected. The existing high quality of the surface water provides the reference point for a Tier 2 antidegradation analysis.

40 CFR §131.12 and R18-11-107(C) both permit limited degradation of a high quality surface water if certain conditions are met. Under 40 CFR §131.12(a)(2), lower water quality may be allowed in a Tier 2 surface water provided: 1) lower water quality is necessary to accommodate important economic or social development in the area in which the water is located, 2) the state assures water quality adequate to protect existing uses fully, 3) the state assures that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources, 4) all cost-effective and reasonable best management practices for nonpoint source control are achieved, and 5) the intergovernmental coordination and public participation provisions of the state’s Continuing Planning Process (CPP) are fully satisfied.

R18-11-107(C) closely parallels the language of 40 CFR §131.12(a)(2). The same conditions must be met under R18-11-107(C) before limited degradation of a high quality surface water is allowed in Arizona. The only difference between the federal and state Tier 2 antidegradation policies is that R18-11-107(C) specifically requires that a public hearing be held on whether limited degradation should be allowed in a Tier 2 surface water. In ADEQ’s view, this public hearing requirement is the equivalent of fully satisfying the intergovernmental coordination and public participation provisions of the state CPP.

Finally, the federal and state antidegradation policies provide special water quality protection for Tier 3 surface waters. Tier 3 surface waters are called “outstanding national resource waters” in the federal antidegradation policy and “unique waters” in the state rule. 40 CFR §131.12(a)(3) and R18-11-107(D) both require the maintenance and protection of existing water quality in a Tier 3 surface water. However, Arizona’s Tier 3 antidegradation rule is broader than the federal antidegradation policy because R18-11-107(D) extends Tier 3 antidegradation protection to surface waters that are *proposed* for unique waters classification. The federal Tier 3 antidegradation policy requires the maintenance and protection of existing water quality “[w]here high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational and ecological significance....”

R18-11-107(D) requires that existing water quality be maintained and protected in surface waters that are classified as unique waters and in surface waters “that the Director has proposed for classification as a unique water pursuant to R18-11-112.” ADEQ extended Tier 3 antidegradation protection to proposed unique waters in amendments to R18-11-112 that were made in 1992. At the time, ADEQ argued that it was important to extend Tier 3 antidegradation protection to proposed unique waters to assure maintenance and protection of existing water quality and to preserve resource values that led to the nomination of the surface water. By “proposed,” ADEQ means surface waters that are formally proposed for unique waters classification in a Notice of Proposed Rulemaking. ADEQ made clear that Tier 3 antidegradation protection should be extended to proposed unique waters only after the formal rulemaking process to classify a navigable water as a unique water is initiated by the publication of a Notice of Proposed Rulemaking. Tier 3 antidegradation protection does not extend to surface waters that are nominated for unique waters classification.

ADEQ has reconsidered the extension of Tier 3 antidegradation protection to proposed unique waters. ADEQ proposes to conform Arizona’s Tier 3 policy to be more consistent with the federal antidegradation policy. ADEQ proposes to repeal the language in the current rule that extends Tier 3 antidegradation protection to surface waters that are *proposed* for unique waters classification. ADEQ proposes to revise R18-11-107(D) as follows:

- D. Tier 3: Existing water quality shall be maintained and protected in a surface water that is classified as a unique water ~~or that the Director has proposed for classification as a unique water~~ pursuant to R18-11-112. The Director shall not allow limited degradation of a unique water pursuant to subsection (C) of this Section.

ADEQ proposes the repeal of language indicated by strikeouts above for several reasons. First, as noted above, the repeal of the language that extends Tier 3 antidegradation protection to proposed unique waters will make the state rule more consistent with federal antidegradation policy.

Second, it is unclear how the extension of Tier 3 antidegradation protection to a proposed unique water can be practically implemented in the absence of data on existing water quality in a proposed unique water. In most cases, there is little or no data on existing water quality for surface waters that are proposed for unique waters classification. While R18-11-112(C)(4) states that a person who nominates a surface water for unique waters classification must submit *available* water quality data relevant to establishing baseline water quality in the proposed unique water, the rule does not make the collection of data on existing water quality a nomination requirement. ADEQ resource constraints usually preclude the collection of surface water quality data during the pendency of a formal rulemaking proposal.

Third, the extension of Tier 3 antidegradation protection to proposed unique waters only extends Tier 3 antidegradation protection for a short period of time. At most, Tier 3 antidegradation protection is extended six months to one year before it otherwise would apply. As ADEQ made clear in the concise explanatory statement for the surface water quality standards in the 1992 triennial review, Tier 3 antidegradation protection is extended to a proposed unique water only when formal rulemaking to classify that surface water as a unique water is initiated by publication of a Notice of Proposed Rulemaking. Under the State Administrative Procedures Act, the formal rulemaking process usually takes 6 months to 1 year to complete after the publication of a Notice of Proposed Rulemaking in the *Arizona Administrative Register*.

Finally, ADEQ believes that the extension of Tier 3 antidegradation protection to proposed unique waters may create an incentive for persons to nominate surface waters for unique water classification in the hope that Tier 3 antidegradation protection can be obtained for the surface water during the pendency of formal rulemaking procedures. ADEQ is concerned that the extension of Tier 3 antidegradation to *proposed* unique waters encourages the nomination of surface waters that are believed to be threatened by mining, grazing, timber harvesting, growth and development, or other land uses but that cannot reasonably be considered to be outstanding state resource waters. The possibility of obtaining Tier 3 antidegradation protection for some interim period combined with the relative ease of nominating surface waters and the broad grounds for unique waters classification in the current rule may explain, at least in part, the large number of nominations in this triennial review (37). The large number of nominations has prompted ADEQ to conduct a complete review of the current unique waters nomination and classification processes in this triennial review. ADEQ proposes to make several changes to the rule that governs the unique waters program [See the discussion of R18-11-112 later in this preamble]. One of the proposed changes relates to R18-11-107(D). ADEQ has reconsidered the extension of Tier 3 antidegradation protection to *proposed* unique waters. ADEQ believes that Tier 3 antidegradation protection should be provided to a unique water only after the formal rulemaking process to classify a unique water is complete. The primary benefit of a unique waters classification is Tier 3 antidegradation protection. This benefit should not be afforded to a surface water prior to the development of a complete administrative record through the rulemaking process, including a cost / benefit analysis of a unique waters classification that is required for approval by the Governor’s Regulatory Review Council.

The need for antidegradation implementation procedures.

The federal antidegradation policy requires that each state identify methods for implementing its antidegradation policy [See 40 CFR §131.12(a)]. Antidegradation implementation is basically a set of procedures that are to be followed when evaluating activities that may impact surface water quality. Current EPA guidance on antidegradation in the *Water Quality Standards Handbook (2nd Edition)* states that antidegradation implementation procedures should specify how a state will determine, on a case-by-case basis, whether, and to what extent, surface water quality may be lowered.

Each state's antidegradation implementation procedures are subject to EPA review. However, EPA's review is limited to ensuring that adequate procedures are included that describe how the state will implement the required elements of an antidegradation review. EPA may disapprove and federally promulgate all or part of a state's antidegradation implementation procedures if the procedures can be implemented in a way that, in EPA's judgment, circumvents the basic intent of the federal antidegradation policy [See *Water Quality Standards Handbook, 2nd Edition*, § 4.3].

In 1994, EPA approved the state's antidegradation rule, R18-11-107, with certain conditions. In approving the state antidegradation rule, EPA noted that it had previously requested that Arizona develop antidegradation implementation procedures. EPA stated in an approval letter dated April 29, 1994 that the development of antidegradation implementation procedures was a condition of EPA's previous approval of the antidegradation rule in the 1986 triennial review and was overdue. EPA noted that the U.S. Fish & Wildlife Service determined in its biological opinion of the surface water quality standards rules conducted under §7 of the Endangered Species Act (ESA) that an incidental take of endangered or threatened species could occur because of the lack of state antidegradation implementation procedures. The U.S. Fish & Wildlife Service further determined that the ESA required the state adoption of antidegradation implementation procedures. EPA conditionally approved the antidegradation rule and stated its expectation that ADEQ would develop and adopt antidegradation implementation procedures by 1995.

In 1994, ADEQ staff drafted "Implementation Guidelines for the State of Arizona Antidegradation Standard." This guidance document was based largely on antidegradation implementation procedures that were developed by EPA Region VIII. ADEQ used the Continuing Planning Process (CPP) public participation procedures to develop the antidegradation implementation guidelines because: 1) Each state is required to have a CPP by §303(e) of the Clean Water Act, and 2) one of the 9 required elements of the CPP is a description of "the process for establishing and ensuring adequate implementation of revised or new water quality standards...under §303(c) of the Act" [See §303(e)(3)(E) of the Clean Water Act and 40 CFR §130.5(b)(6)]. Since the antidegradation rule, R18-11-107, is included in the surface water quality standards rules and is a required element of the state's water quality standards submission to EPA, ADEQ thought it was appropriate to develop the antidegradation implementation procedures through the CPP process.

In 1995, ADEQ presented a draft of the state's antidegradation implementation guidelines to the Councils of Governments (COGs) and requested public comments. A few stakeholders provided comments to ADEQ and criticized the use of the CPP public participation process to develop the antidegradation implementation guidelines. In general, the stakeholders who submitted comments to ADEQ were concerned that the use of the CPP public participation process was inadequate because it did not reach major stakeholders in the regulated community who may be directly affected by the state's adoption of antidegradation implementation procedures. This concern was borne out by the relatively few comments that ADEQ received on the antidegradation implementation guidelines as a result of the public meetings held with the COGs. Several stakeholders argued that ADEQ should use the rulemaking process to adopt the antidegradation implementation procedures because rulemaking was, in their view, the only way that ADEQ could ensure that the antidegradation implementation procedures would receive adequate public review.

In the 1996 triennial review, EPA again reviewed and approved ADEQ's revisions to the surface water quality standards rules, including minor revisions to the antidegradation rule. In an EPA approval letter dated December 31, 1998, EPA addressed the issue of antidegradation implementation procedures again and requested that ADEQ provide a schedule for their adoption in the 2000 triennial review. The relevant part of the December 31, 1998 approval letter from EPA states:

The [U.S. Fish & Wildlife] Service has asked that ADEQ provide a schedule for adoption of antidegradation implementation in the Year 2000 triennial review of water quality standards. While the state is long overdue for adoption of antidegradation implementation, it is EPA's understanding that the State has been using the publicly reviewed draft *Implementation Guidelines for the State of Arizona Antidegradation Standard* since 1995. This guidance has been used to implement the antidegradation rule in over 40 permit reviews conducted by ADEQ. As such, the draft implementation document is the *de facto* policy of the State. In the interim, the State is developing a new antidegradation implementation guidance that would more comprehensively analyze water quality; incorporating physical integrity and biological measures to complement the existing approach which is largely based on measures of water chemistry. It is our expectation that the State will complete development and adopt this revised implementation policy for antidegradation during the Year 2000 triennial review. We request that the State provide a schedule for adoption of this implementation guidance.

ADEQ intends to revise the state's antidegradation implementation procedures in this triennial review. ADEQ is persuaded by the lack of public participation in the CPP process that the triennial review process is a better administrative process for obtaining adequate public review of this important element of the water quality standards program. ADEQ proposes to conduct public participation activities to review the current antidegradation implementation procedures concurrent with this triennial review. The review of the antidegradation implementation procedures will be on the same schedule as the proposed revisions to the surface water quality standards rules. ADEQ expects to complete the triennial review process by December 31, 2001. While ADEQ proposes to use a public participation process concurrent with the triennial review to ensure adequate public participation in the development of the antidegradation implementation guidelines, ADEQ does not, at this time, propose to incorporate the antidegradation implementation guidance into rule.

Narrative Water Quality Standards [R18-11-108]

There is a statutory preference in Arizona law for numeric water quality standards if adequate information exists to establish numeric standards [See § 49-221(D)]. However, both federal and state law provide authority for ADEQ to establish narrative water quality standards. The federal water quality standards regulation says that states may establish narrative water quality criteria or criteria based upon biomonitoring methods where numeric criteria cannot be established or to supplement numeric water quality criteria [See 40 CFR §131.11(b)(2)]. Arizona law also provides authority for ADEQ to adopt narrative water quality standards that "the Director may deem appropriate" [See § 49-221(D)].

ADEQ has used these authorities to promulgate the narrative water quality standards that are found in R18-11-108. Narrative water quality standards supplement the numeric water quality criteria that have been established to maintain and protect water quality for designated uses. Narrative water quality standards also describe the conditions that are necessary to maintain and protect the aesthetic qualities of Arizona's surface waters. Arizona's current narrative standards are expressed as 9 "free from" statements. R18-11-108 states that Arizona's surface waters shall 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 or that impair recreational uses;
- Cause objectionable odor in the area in which a surface water is located;
- Cause off-taste or odor in drinking water;
- Cause off-flavor in aquatic organisms or waterfowl;
- Are toxic to humans, animals, plants, or other organisms;
- 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;
- Cause or contribute to a violation of an aquifer water quality standard;

- Change the color of the a surface water from natural background levels of color.
- Float as debris, foam, or scum; or that cause 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 water craft is not considered to be a violation of this last narrative standard).

ADEQ proposes 3 revisions to the narrative water quality standards in this triennial review. First, ADEQ proposes to amend the bottom deposits narrative standard to focus it on the protection of aquatic life and to repeal the current reference to impairment of recreational uses. Second, ADEQ proposes to adopt a narrative standard to prevent excessive concentrations of suspended solids in a surface water that impair a domestic water source use. Third, ADEQ proposes to amend the narrative standard that addresses undesirable organoleptic effects in aquatic organisms and waterfowl by deleting the reference to “waterfowl.”

Revised narrative standard to prevent siltation and excessive sedimentation

The current surface water quality standards rules include a narrative standard that is intended to prevent harmful effects of bottom deposits on aquatic life and the impairment of recreational uses. R18-11-108(A)(1) states:

A surface water shall 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 or that impair recreational uses.

Bottom deposits, or settleable solids, are materials that settle out of suspension from the water column within a given period of time. Excessive sediment deposits can negatively affect aquatic life. Bottom deposits affect fish directly by smothering eggs in redds, choking spawning habitats, reducing over-wintering habitat for fry, and indirectly by altering invertebrate species composition thereby decreasing the abundance of preferred prey (Cordone and Kelley 1961). Deposited sediments also fill in rearing pools and interstitial spaces of riffles resulting in reduced habitat complexity in stream channels. Bottom deposits fill the interstitial spaces in gravel spawning beds interfering with inter-gravel permeability and transfer of dissolved oxygen thereby reducing the survival of fish eggs and juveniles.

Bottom deposits that blanket the stream bottom substrates affect benthic macroinvertebrate populations as well. Macroinvertebrates (aquatic insects) are affected by habitat reduction and change resulting in increased drift, lowered respiration capacity through blocking of gill surfaces or through lowered oxygen concentrations, and the reduced efficiency of feeding activities, especially filter feeding and visual predation (Lemly 1982, Waters 1995). Also, substrate size is important to aquatic insects because it is the primary factor influencing abundance and distribution (Minshall 1984). Adamus (1995) listed a reduction in species richness and a community shift from herbivorous and filter-feeding species to sediment burrowing species (worms) as impairments due to sedimentation in wetlands.

Though our recent understanding of fluvial geomorphology has been greatly enhanced by the work and methods of Dave Rosgen, quantitative approaches for assessing physical integrity and bottom deposits in all types of stream systems in Arizona are not well understood. Aggradation, degradation, and the transport of sediment in streams is influenced by many factors including land forms, slopes, soil erodibility, precipitation, runoff, vegetative cover, stream channel and bank erosion, and channel disturbances. The watershed processes that cause adverse sediment impacts are rarely simple and they cannot be reduced to instantaneous measurements of a single indicator such as turbidity. Although ADEQ and several other western states are developing a better understanding of fluvial geomorphic processes through regional curves and Rosgen’s method for evaluating bank erodibility, easily implementable methods for distinguishing natural from human-caused sedimentation in our streams are not yet available. Through continued research, more quantitative approaches to documenting sedimentation processes may be developed. ADEQ rejects the use of numeric turbidity criteria as a surrogate indicator because it is inappropriate for use in desert ecosystems and we are not yet ready to implement physical integrity criteria. Therefore, ADEQ is pursuing a narrative approach for implementing the narrative bottom deposit standard.

ADEQ proposes to amend the current narrative “bottom deposits” standard to focus the standard on the protection of aquatic life. ADEQ proposes to repeal the language in the current rule that refers to the impairment of recreational uses as follows:

A surface water shall 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 ~~or that impair recreational uses.~~

ADEQ proposes to repeal the reference in the narrative standard to the impairment of recreational uses because of the lack of an objective way to determine impairments of recreational use. The national criteria document that EPA published on settleable solids provides no guidance on concentrations of settleable materials that cause impairment of recreational uses [See “Solids (Suspended, Settleable) and Turbidity,” *Quality Criteria for Water*, 1986, United States Environmental Protection Agency, Office of Water, Regulations and Standards, Washington, D.C. (May 1, 1986)]. The EPA rationale for the recommended settleable solids criterion discusses adverse effects of settleable materials that damage invertebrate populations, block gravel spawning beds, and remove dissolved oxygen from surface waters. EPA also discusses imbalances in stream biota and reductions in biodiversity that are a result of the deposition of organic materials to bottom sediments. However, there is no discussion in the EPA criteria document for settleable solids that addresses the impairment of recreational uses.

The determination of whether there is an impairment of recreational use is too subjective and cannot be consistently implemented. ADEQ does not have practical implementation procedures for determining when bottom deposits cause an impairment of a recreational use of a surface water. This lack of practical implementation procedures is primarily due to the subjective nature of the recreational use impairment determination. Reasonable persons may differ over the amounts or concentrations of bottom deposits or settleable solids that negatively affect the aesthetic qualities of a surface water to the extent that there is an impairment of a recreational use. What amounts or concentrations of bottom deposits impair the use of a surface water for swimming, fishing, wading, or other water-based recreational activities? For this reason, ADEQ proposes to repeal the reference in the “bottom deposits” narrative standard to the impairment of recreational uses.

The narrative “bottom deposits” standard should be retained but its language should be amended to focus on preventing amounts or concentrations of bottom deposits that impair aquatic life designated uses. Adequate implementation procedures can be developed for a narrative standard that is more focused on the protection of aquatic life. Implementation procedures can be developed that describe how the bottom deposits narrative standard would be applied and how determinations of compliance will be made.

Implementation guidance for the revised narrative “bottom deposits” standard

The primary purpose of the proposed narrative “bottom deposits” standard is to prevent excessive sedimentation and siltation that adversely affect aquatic life in a surface water. For this reason, the proposed narrative standard specifically states that surface waters shall be free from pollutants in amounts and concentrations that settle to form bottom deposits *that impair aquatic life designated uses*. The language of the proposed narrative standard directly links bottom deposits to the impairment of aquatic life. This linkage provides a conceptual framework for the development of implementation procedures for determining compliance with the narrative “bottom deposits” standard. The conceptual framework has two basic elements: 1) bioassessment procedures for determining whether there is an impairment of aquatic life, and 2) habitat assessment procedures for determining that the cause of the impairment of aquatic life is due to excessive sedimentation or siltation.

ADEQ proposes to use biological integrity assessments, or bioassessments, to determine whether aquatic life is impaired in a surface water. ADEQ’s bioassessments involve: 1) collection of benthic macroinvertebrate (i.e. bottom-dwelling aquatic insects and other invertebrates) samples from riffles in wadeable, perennial streams, 2) collection of relevant habitat and chemical stream measurements, 3) taxonomic identification of specimens in the sample, and 4) a comparison of the sample site species list with a composite reference species list using a multi-metric analysis tool to evaluate attainment of the aquatic and wildlife use. Since bioassessments are a direct measure of the condition of a biological community in a surface water, they are a better measure than surrogate chemical measurements for determining whether an impairment of aquatic life exists. ADEQ’s bioassessment sampling protocols for use in wadeable, perennial streams in Arizona can be found in Meyerhoff and Spindler (1994). The multi-metric tool measures structural, functional, tolerance and richness characteristics of the benthic macroinvertebrate community, is empirically derived in Arizona, and can be found in two documents, Gerritsen and Leppo (1998) and Gerritsen and Leppo (2000).

There are 2 multi-metric tools, one developed for support of the aquatic and wildlife (cold water) designated use and one for the aquatic and wildlife (warm water) designated use. These tools, called Indexes of Biological Integrity (IBI), consist of a combination of metrics or key attributes of the benthic macroinvertebrate community which best discern impairment from the reference condition. The cold water IBI consists of 7 metrics selected for their ability to discriminate impairments in cold water streams located at >5000' of elevation. The 7 metrics are: total taxa richness, Diptera taxa richness, intolerant taxa richness, Hilsenhoff Biotic Index (HBI), percent composition by Plecoptera (stoneflies), percent composition by scrapers, and scraper taxa richness. The warm water IBI consists of 9 metrics which best discern impairment in warm water streams located at <5000' of elevation. The 9 metrics are: total taxa richness, Ephemeroptera taxa richness (mayflies), Trichoptera taxa richness (caddisflies), Diptera taxa richness, percent Ephemeroptera abundance, percent composition by the dominant taxon, scraper taxa richness, percent composition by scrapers, and the Hilsenhoff Biotic Index. These metrics are easily calculated from a list of species and their abundances. A total IBI score is calculated as an average of the individual metric scores. The IBI score is then categorized as being exceptional, good, fair, or poor using a 25th percentile of reference value scoring system. Streams with an IBI score that is less than the 25th percentile of reference are not attaining the aquatic life designated use.

Once an impairment of aquatic life is found using a bioassessment and the applicable IBI, habitat data and chemical stream data are used to diagnose the probable cause of the impairment as the next step for implementing the narrative bottom deposits standard. ADEQ proposes to use qualitative habitat assessment observations and associated quantitative measurements related to bottom deposits to determine if an impairment of aquatic life in a surface water is caused by excessive sedimentation or siltation. The proposed habitat assessment index consists of 4 substrate and one bank stability parameter adopted from USEPA's visual-based habitat assessment protocols described in the Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition (July 1999).

There are two habitat assessment indexes, one for use in cold water habitats in streams located at >5000' and one for use in warm water habitats located at <5000' in elevation. Each habitat assessment index involves visual-based field observations of the in-stream and bank habitat parameters associated with bottom deposits on a ranking scale of 1 to 4. The 5 habitat parameters are riffle substrate, pool substrate, embeddedness, sediment deposition, and bank stability. To ensure consistency in the habitat assessment procedure, written descriptions of each habitat parameter and the visual-based evaluation criteria for each category are included on a standardized assessment form. The habitat scores are summed for a total habitat score ranging from 5 - 20. The habitat score is then categorized as being good, fair, or poor using the 25th percentile of reference value scoring system. If the habitat index score is less than the 25th percentile of reference, then a biological impairment is determined to be associated with bottom deposits and an exceedance of the narrative bottom deposit standard results.

ADEQ proposes to use IBI scores accompanied by habitat assessment index scores to implement the narrative bottom deposits standard. ADEQ acknowledges that the use of the proposed implementation procedures has some limitations. ADEQ's current bioassessment protocols and indexes of biological integrity do not apply to lakes, reservoirs, large rivers (i.e. non-wadeable), intermittent waters, ephemeral waters, or effluent dependent waters. Since the implementation of the bottom deposits narrative standard depends upon the use of bioassessment and the use of an applicable index of biological integrity to establish aquatic life impairment, the narrative standard for bottom deposits cannot be implemented for other categories of surface water until ADEQ develops bioassessment procedures and associated indexes of biological integrity for them. Consequently, the narrative bottom deposits standard will apply initially only to wadeable, perennial streams.

Narrative standard for suspended solids

ADEQ proposes to adopt a new narrative standard to address excessive concentrations of suspended solids in surface waters to prevent impairment of the domestic water source designated use. Excessively high suspended solids concentrations can negatively affect the use of a surface water as a raw water source for drinking water supply. Suspended solids and sediment can cause taste and odor problems in drinking water, block drinking water plant uptakes, foul drinking water treatment systems, and increase operation and maintenance costs at water treatment plants. Suspended solids can shield pathogenic microorganisms from the action of disinfectants and reduce disinfection efficiency at a water treatment plant.

The ability of a drinking water treatment plant to remove turbidity and suspended solids from a raw surface water source to achieve acceptable final turbidities required by Safe Drinking Water Act regulations is a function of the composition of the suspended material in a surface water source as well as its concentration. Very high sediment levels in a surface water may require that water supply intakes for drinking water treatment plants be shut down until a surface water source clears or they may result in increased system maintenance (e.g. more frequent back-flushing of filters). Because of the variability of water treatment plant removal efficiencies, it is not possible for ADEQ to prescribe a single numeric criterion for suspended solids to maintain and protect water quality for the domestic water source designated use. However, a narrative standard can be developed that prohibits suspended solids in amounts or concentrations that interfere with the ability of a water treatment plant to comply with Safe Drinking Water Act requirements. ADEQ proposes to add a new narrative standard to prohibit excessively high concentrations of suspended solids in a surface water that impair a domestic water source use in R18-11-108(A)(1). ADEQ will determine compliance with the proposed narrative standard directly from the operation of water treatment plants that rely on surface water sources. For example, if a water treatment plant must close its intakes because of excessively high suspended solids in a surface water source, the narrative standard would be violated. ADEQ proposes the following narrative standard:

A. A surface water shall be free from pollutants in amounts or combinations that:

1. Are suspended in the water column that impair a domestic water source use.

ADEQ considered the development of a narrative standard to prohibit excessively high concentrations of suspended solids that impair aquatic life uses but ADEQ was unable to develop practical implementation procedures for such a standard. Consequently, the proposed narrative “suspended solids” standard is limited in its application. The intent of the proposed narrative standard is to maintain and protect water quality so surface waters can be used as a raw drinking water sources. The narrative standard is violated only when suspended solids concentrations in a surface water directly interfere with the operation of a water treatment plant.

Revision of the narrative standard prohibiting off-flavor in aquatic organisms or waterfowl

ADEQ proposes to amend R18-11-108(A)(4) which states that surface waters shall be free from pollutants that cause off-flavor in aquatic organisms *or waterfowl*. ADEQ proposes to repeal the reference to “or waterfowl” because it is inconsistent with EPA’s recommended national criteria for tainting substances and because ADEQ does not have practical implementation procedures to determine compliance with the “waterfowl” part of the current standard.

Implementation procedures exist for determining compliance with the part of the narrative standard that is intended to protect against undesirable organoleptic effects in edible portions of aquatic organisms. For example, EPA has published national criteria guidance on tainting substances in Quality Criteria for Water, 1986 (the “Gold Book”). EPA recommends the following narrative criterion for tainting substances:

Materials should not be present in concentrations that individually or in combination produce undesirable flavors *which are detectable by organoleptic tests performed on the edible portions of aquatic organisms* [Emphasis added].

The rationale in the EPA criteria document for tainting substances is clearly focused on preventing abnormal or undesirable flavors in fish or shellfish. Obviously, abnormal flavors in fish and shellfish negatively affect product quality, marketability, and consumer acceptance of fish and shellfish that are sold in foreign or interstate commerce. Recreational fishing also is adversely affected by tainting substances in surface water that result in off-flavored fish. For most sport fishermen, the consumption of their catch is an important part of their recreation. An off-flavored catch may result in the diversion of fishermen and recreational fishing activity to surface waters that are not impacted by tainting substances.

The Gold Book contains a review of studies on tainting substances that impair the flavor of aquatic organisms. Earlier criteria documents, such as the Blue Book, contain discussions on tainting substances and the use of field exposure and organoleptic tests to determine the existence or the magnitude of a tainting problem in a surface water. Field exposure tests involve holding test species of fish or other edible aquatic life in cages at selected locations in a surface water where a tainting problem is suspected and subsequently conducting flavor tests on the edible portions of the fish or aquatic organisms. Field exposure tests are time-consuming and organoleptic tests require experienced judges who are trained in conducting flavor evaluations. While it would be difficult for ADEQ to conduct field exposure tests or the organoleptic tests to determine compliance with the current narrative standard, at least implementation procedures exist that ADEQ could use to determine compliance on a case-by-case basis where a tainting problem in a surface water is suspected. However, there is nothing in the discussion of tainting substances in the EPA criteria guidance documents that relates to undesirable organoleptic effects in waterfowl. Moreover, because waterfowl are migratory, it would be impossible to establish a cause-and-effect relationship between tainted flesh in waterfowl and pollution of Arizona surface waters. For these reasons, ADEQ proposes to repeal the reference to “or waterfowl” in R18-11-108(A)(4). ADEQ proposes to revise the narrative standard as follows:

A. A surface water shall be free from pollutants in amounts or combinations that:

4. Cause off-flavor in aquatic organisms ~~or waterfowl~~.

ADEQ will determine compliance with the proposed narrative standard by using field exposure tests and organoleptic tests conducted on the edible portions of aquatic organisms (e.g., fish) as described in the EPA criteria documents. ADEQ does not routinely monitor surface waters for the presence of pollutants that cause off-flavor in aquatic organisms. The field investigation of a surface water that is suspected of having a tainting problem may be initiated as part of a complaint investigation.

Narrative color standard [R18-11-108(A)(8)]

R18-11-108(A)(8) states that a surface water shall be free from pollutants in amounts or combinations that “change the color of the surface water from natural background levels of color.” The intent of this narrative standard is to maintain and protect the aesthetic qualities of surface waters and to prohibit discharges of pollutants that cause unnatural and objectionable colors in a surface water.

Color in water results primarily from degradation processes in the natural environment. Although colloidal forms of iron and manganese occasionally are the cause of color in water, the most common causes of color change are complex organic compounds originating from the decomposition of naturally-occurring organic material. Sources of organic material include materials from soils such as tannins and humic acids, decaying plankton and other decaying aquatic plants; and wastewater discharges. Industrial discharges may contain color-changing organic compounds (e.g., discharges from pulp and paper industrial facilities). Other industrial discharges may contain brightly colored substances such as those from certain processes in the textile and chemical industries (e.g. dyes).

Surface waters also may appear colored because of the presence of suspended solids and turbidity. Color that is due to suspended matter and turbidity is commonly referred to as apparent color. Changes in the apparent color of a surface water due to turbidity and suspended solids are acceptable when the change is due to natural background. Turbidity and suspended solids that are present in a surface water because of naturally-occurring conditions and are not the result of a discharge or anthropogenic activity falls within the meaning of “natural background levels of color.” For example, a surface water that normally flows clear may appear brown in color during a flood event because of high concentrations of suspended solids and turbidity. In this example, the change in the color of the surface water during a flood event would be considered to be a part of the natural background. On the other hand, a surface water may change color because of the discharge of a highly colored industrial wastewater whose color is contributed principally by colloidal or suspended materials in the discharge. In the latter case, the change in the apparent color of the surface water would be a change from the natural background levels of color. Changes in the apparent color of a surface water from a highly colored point source discharge or other human activities are prohibited by the narrative color standard.

Apparent color is differentiated from true color. True color is the color of a surface water from which suspended matter and turbidity has been removed. ADEQ considers changes in the true color of a surface water that are caused by highly colored point source discharges or other human activities to violate the current narrative standard. However, changes in the true color of surface water due to naturally-occurring conditions (e.g., the decay of aquatic plants or the presence of tannins in the water) would not be considered a violation of the narrative color standard.

ADEQ prepared a preliminary draft set of revisions to the surface water quality standards rules and suggested a revision of the current color narrative standard. ADEQ suggested amending the narrative standard to state that surface waters shall be free from pollutants in amounts or concentrations that “produce objectionable color.” ADEQ received public comments opposing the suggested revision on the ground that the word “objectionable” was a subjective term that would make consistent enforcement of the narrative standard more difficult. ADEQ agrees and is not proposing the suggested revision in this rule package. The comment was made that if any change to the narrative color standard was deemed necessary, then the standard should incorporate some definition of what “color” means. Citing Standard Methods for the Examination of Water and Wastewater, 20th Edition, one commenter suggested that the narrative standard should address only true color. The commenter suggested the following revision to the narrative standard: “A surface water shall be free from pollutants in amounts or combinations that.....produce a change in the true color of the navigable water from natural background levels of true color.” For reasons given above, ADEQ disagrees with limiting the narrative standard to true color only. The narrative standard should prohibit changes in true color or apparent color that are not due to naturally-occurring conditions. ADEQ has decided that the current narrative standard is preferable to ADEQ’s suggested revision in the preliminary draft rules and the alternative language suggested in comments on the preliminary draft rules. ADEQ proposes to retain the current narrative standard without change in this triennial review.

Numeric Water Quality Criteria [R18-11-109]

Revision of the Current Bacterial Water Quality Standards in R18-11-109(B) and (C)

a. *Purpose of bacterial water quality standards*

Water quality standards for bacteria are concentrations of indicator organisms that should not be exceeded in order to protect human health from waterborne pathogens. Pathogens are disease-causing organisms that include viruses, parasites, and bacteria. Many waterborne pathogens cannot be measured directly. Surface waters may contain different pathogens, making individual measurement and quantification impractical even if analytical methods were available to detect all pathogens of concern. Consequently, indicator organisms are used to predict human health risks from pathogens that may be present in surface waters. EPA has conducted health effects studies which demonstrate that *Escherichia coli* (*E. coli*) and enterococci are best suited for predicting the presence of pathogens in freshwater that cause human gastrointestinal illness. EPA published these recommendations in Ambient Water Quality Criteria for Bacteria - 1986, U.S. Environmental Protection Agency, EPA-440 / 5-84-002.

EPA has strongly encouraged states to adopt its national criteria document recommendations for *E.coli* or enterococci to replace surface water quality standards that are expressed as concentrations of total coliforms or fecal coliforms. In recent EPA implementation guidance for the ambient water quality criteria for bacteria, EPA stated that the transition to *E. Coli* and enterococci criteria is a high priority for EPA in its review of state-adopted water quality standards in triennial reviews occurring in 2000 - 2002. EPA has stated in its implementation guidance that if states fail to adopt bacteria standards that are consistent with its national criteria guidance, EPA intends to federally promulgate water quality standards to ensure that its national criteria guidance recommendations for bacteria apply in all states, territories, and authorized tribes by 2003. ADEQ adopted *E. coli* criteria for the state’s full body contact designated use in 1996. In this triennial review, ADEQ proposes to further amend the current bacterial standards in R18-11-109(B) and (C) to be more consistent with EPA ambient water quality criteria for bacteria.

b. *History of current water quality standards for bacteria*

Environmental protection and public health officials have been concerned for many years about the development of appropriate standards for protecting the microbiological quality of surface waters that are used for bathing and swimming. Microbiological water quality standards for surface waters were first considered in 1924 by the American Public Health Association’s Committee on Bathing Places (“the APHA Committee”). At first, the APHA Committee did not recommend microbiological water quality standards because of the lack of epidemiological data to support standards and because the APHA Committee was reluctant to alarm the public about the dangers of outdoor bathing places without good evidence. The APHA Committee maintained this position until 1936 when it recommended a water quality standard that said that water quality was unacceptable for bathing if total coliform bacteria densities in water were greater than 1,000 per 100 ml. The APHA Committee’s decision to recommend a water quality standard expressed as a total coliform concentration was based on the belief that coliform organisms were associated with fecal material from the gut of warm-blooded animals and that the presence of coliform organisms in water was an indicator of the potential presence of enteric pathogens.

In the late 1940's and 1950's, the U.S. Public Health Service conducted a series of epidemiological studies at bathing places in Chicago, Kentucky, and Long Island, New York to determine the human health effects associated with swimming in surface waters. The studies showed that there was a detectable human health effect (diarrhea) when total coliform densities in water were approximately 2,000 per 100 ml and greater. Based on this finding and a second finding that the subset of fecal coliform organisms was a better indicator of microbiological water quality in recreational waters than total coliforms, the National Technical Advisory Committee of the Federal Water Pollution Control Association (NTAC) recommended water quality standards for bacteria in surface waters. The recommended standards were published in the 1968 Report to the Committee on Water Quality Criteria (the "Green Book"). The NTAC recommended that fecal coliforms be used as indicator organisms for evaluating the microbiological quality of surface waters that were used for recreation. The NTAC recommended that fecal coliform densities in a surface water should not exceed a log mean of 200 per 100 ml based upon a minimum of 5 samples taken within a 30-day period. The NTAC also recommended that not more than 10% of the samples collected during a 30-day period should exceed 400 per 100 ml, as determined by either the multiple tube fermentation or the membrane filter procedure.

In 1972, EPA published Water Quality Criteria, 1972, A Report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences and National Academy of Engineering, Washington, D. C. 1972 (the "Blue Book"). The NAS / NAE made no specific recommendations for bacterial water quality standards for recreational waters in the Blue Book because of a lack of valid epidemiological data. In the same year, EPA initiated a series of human health effects studies at marine and fresh water bathing beaches. These studies were designed to determine if swimming in sewage-contaminated water carried a health risk for bathers, and, if so, to what types of illnesses. EPA also wanted to determine which indicator organism was best correlated to swimming-associated health effects and if there was a strong enough relationship between any particular indicator and health effects to support the recommendation of a water quality criterion. EPA studied the differences in symptomatic illness between swimming and non-swimming beach goers at marine beaches between 1972-1978 and fresh water bathing beaches between 1978-1982. The health effects studies showed that: 1) swimmers who bathed in sewage-contaminated water were at greater risk of contracting gastroenteritis, and 2) as the microbiological quality of water degrades, the swimming-associated illness rate increases. From EPA's evaluation of the bacteriological data from the health effects studies, EPA estimated that there would be 8 illnesses per 1,000 swimmers if persons swam in fresh water with a maximum geometric mean of 200 fecal coliforms per 100 ml.

In the 1976 water quality criteria document (the "Red Book"), EPA recommended the fecal coliform criteria that NTAC had previously recommended in the Green Book (i.e., 5-sample mean of 200 / 100 ml) as the microbiological water quality standard for surface waters that were used for recreation. Many states, including Arizona, appear to have adopted EPA's recommended fecal coliform criteria as surface water quality standards for primary contact recreation or the full body contact recreation designated use.

In 1986, EPA recommended new criteria to maintain and protect microbiological water quality in surface waters that were used for recreation. EPA recommended that states adopt either enterococci or *E. coli* water quality criteria for fresh waters that were used for recreation. EPA's fresh water health effects studies conducted between 1972-1982 confirmed that there was a strong correlation between *E. coli* densities and swimming-related gastrointestinal illness and that *E. coli* was a better indicator of swimming-associated gastrointestinal illness than fecal coliform [See Dufour, Alfred, Health Effects Criteria for Fresh Recreational Waters, EPA 600 / 1-84-004, Health Effects Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina (August, 1984)]. EPA recommended that the 30-day geometric mean concentration (5-sample minimum) of *E. coli* in fresh water should not exceed 126 cfu / 100 ml. This value was based on the same risk level of contracting gastrointestinal illness (no more than 8 illnesses per 1,000 swimmers) that previously was used for the recommended fecal coliform criteria. EPA also recommended single sample maximum concentrations of *E. coli* based upon anticipated levels of bathing use. The recommended single sample maximum concentrations were:

- Designated bathing beach: 235 cfu / 100 ml.
- Moderate use for bathing: 298 cfu / 100 ml.
- Light use for bathing: 276 cfu / 100 ml.
- Infrequent use for bathing: 576 cfu / 100 ml.

In 1996, ADEQ adopted *E. coli* criteria to maintain and protect surface water quality for the full body contact recreation designated use. The *E. coli* criteria were based upon EPA's national criteria guidance for bacteria. ADEQ adopted a 30-day geometric mean criterion (5-sample minimum) of 130 cfu / 100 ml. This criterion was based on EPA's recommended *E. coli* criterion of 126 cfu / 100 ml rounded to the nearest ten. ADEQ adopted a single sample maximum concentration of 580 cfu / 100 ml. The single sample maximum concentration was based upon EPA's least stringent single sample maximum concentration for fresh waters that are infrequently used for bathing (i.e., 576 cfu / 100 ml rounded to the nearest ten).

EPA recently reaffirmed its recommended water quality for bacteria in a document called Draft Implementation Guidance for Ambient Water Quality Criteria for Bacteria -- 1986, U.S. Environmental Protection Agency, Office of Water, EPA-823-D-00-001 (January, 2000), § 2.0. EPA reviewed the original health effects studies supporting its recommended 1986 water quality criteria for bacteria and the literature on epidemiological studies conducted after EPA performed its initial marine and freshwater studies of swimming-associated health effects. As a result of these reviews, EPA concluded that when applied and implemented conservatively, EPA's recommended criteria for *E. coli* are more protective of human health for gastrointestinal illness than fecal coliform criteria. EPA concluded:

The epidemiological studies conducted since 1984, which examined the relationships between water quality and swimming-associated health effects, have not established any new or unique principles that might significantly affect the current guidance EPA recommends for maintaining the microbiological safety of marine and freshwater bathing beaches. Many of the studies have, in fact, confirmed and validated the findings of the U.S. EPA studies. There would appear to be no good reason for modifying the Agency's current guidance for recreational waters at this time.

As a result of its review, EPA reaffirmed its 1986 water quality criteria for *E. coli* as representing the best available science and serving as a defensible foundation for protecting public health in surface waters that are used for recreation. ADEQ proposes to adopt these *E. coli* criteria to protect recreational uses of surface waters in Arizona.

a. More stringent E. coli criteria for the full body contact designated use

ADEQ proposes to revise the current *E. coli* criteria for the full body contact recreation designated use in this triennial review. ADEQ proposes to adopt a slightly more stringent geometric mean concentration of 126 cfu / 100 ml for the FBC designated use (the current geometric mean standard is 130 cfu / 100 ml). The proposed *E. coli* criterion of 126 cfu / 100 ml is the same as EPA's national criteria guidance recommendation for *E. coli*. ADEQ also intends to propose a more stringent single sample maximum criterion for the FBC designated use. The current single sample maximum for FBC (580 cfu / 100 ml) is based on the least stringent microbiological quality criterion that EPA recommends for surface waters that are infrequently used for full body contact recreation. ADEQ's adoption of the least stringent criterion as a statewide standard results in its application to all surface waters in the state with the FBC designated use, regardless of the level of expected recreational use. Consequently, the least stringent single sample maximum criterion applies equally to surface waters with designated bathing beaches that are heavily used for recreation and surface waters that are infrequently used for recreation. While the least stringent *E. coli* criterion recommended by EPA may be appropriate for surface waters in Arizona that are infrequently used for swimming or bathing, it may not provide an adequate level of human health protection in surface waters that receive heavy recreational use [e.g., Slide Rock at Oak Creek, the area of the Lower Salt River used for tubing, designated bathing beaches along the Colorado River and at Saguaro and Canyon Lakes]. Consequently, ADEQ proposes to adopt the EPA-recommended single sample maximum criterion of 235 cfu / 100 ml that applies to designated bathing beaches as the statewide criterion for the FBC designated use. The adoption of a more stringent single sample maximum criterion ensures that heavily-used recreational waters in the state are protected by adequate microbiological water quality standards.

b. Adoption of E. coli criteria for the partial body contact recreation designated use

ADEQ proposes to adopt EPA's recommended *E. coli* criteria for the partial body contact (PBC) designated use. The current water quality criteria for the PBC designated use are expressed as fecal coliform concentrations. ADEQ recommends adoption of *E. coli* criteria for the PBC designated use for two reasons. First, the proposed *E. coli* criteria are more scientifically defensible. *E. coli* criteria are supported by the health effects studies that have been conducted to support EPA's national criteria guidance recommendations for bacteria. EPA recommends the use of *E. coli* as an indicator organism instead of fecal coliforms. Second, ADEQ questions the scientific defensibility of the current fecal coliform criteria for the PBC designated use. The current fecal coliform criteria for the PBC designated use are as follows:

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30-day geometric mean (5-sample minimum): 1000 cfu / 100 ml

10% of all samples for a 30-day period: 2000 cfu / 100 ml

Single sample maximum: 4000 cfu / 100 ml

ADEQ has been unable to find anything in the national criteria documents or health effects literature that supports the current fecal coliform densities for the PBC designated use. ADEQ has been unable to find anything in the literature that supports a quantifiable relationship between the fecal coliform densities prescribed in the current rule and human health risks associated with exposure to surface waters through partial body contact recreational activities.

EPA does not recommend water quality criteria for secondary or partial body contact recreation to protect human health. Water quality criteria for the PBC designated use might conceivably be based on human health effects of dermal contact, inhalation, or incidental ingestion of surface water. However, there is very little human health effects data for such exposures. EPA acknowledges that there is significant uncertainty in recreational water risk assessments regarding the actual exposure levels associated with ingestion, inhalation, and dermal contact with contaminated water and corresponding levels of illness [See "Action Plan for Beaches and Recreational Waters," U.S. Environmental Protection Agency, Office of Research and Development, Office of Water, EPA / 600 / R-98 / 079, March, 1999, p. 8]. In light of this uncertainty, ADEQ proposes to adopt the same geometric mean criterion for *E. coli* that EPA recommends for full body contact recreation as the water quality criterion for the PBC designated use [that is, 126 cfu / 100 ml]. ADEQ proposes to adopt the same *E. coli* criteria to maintain and protect water quality for FBC and PBC. EPA has stated that it considers this approach to be consistent with § 101 of the Clean Water Act. ADEQ believes that a conservative approach to public health protection is justified in the absence of definitive risk assessments or scientifically defensible *E. coli* criteria for the PBC designated use. In effect, ADEQ proposes to adopt microbiological water quality criteria for PBC that err on the side of protecting human health. Surface water quality that is acceptable for swimming should also be acceptable for recreational activities that do not involve swimming or full body contact recreation. ADEQ also proposes to adopt the least stringent *E. coli* single sample maximum criterion of 576 cfu / 100 ml that applies to surface waters that are infrequently used for bathing as the most appropriate criterion for the PBC designated use.

The proposed rule states:

¶A. The following water quality standards for *Escherichia coli* (*E. coli*), expressed in colony forming units per 100 milliliters of water (cfu / 100 ml), shall not be exceeded:

E. coli	FBC	<u>PBC</u>
30-day geometric mean (5-sample minimum)	430	
Geometric mean (4-sample minimum)	<u>126</u>	<u>126</u>
Single sample maximum	580 <u>235</u>	<u>576</u>

c. Repeal of fecal coliform criteria for effluent dependent waters

ADEQ proposes to repeal the current fecal coliform criteria that have been established for effluent dependent waters (EDWs) that are prescribed in R18-11-109(B)(2). The current microbiological water quality standards for EDWs are the same fecal coliform criteria that previously applied to the FBC designated use prior to the adoption of *E. coli* criteria for FBC in 1996. The current fecal coliform criteria for EDWs appear to be based on the NTAC recommendations for microbiological water quality standards to protect recreational surface waters that date back to 1968. When ADEQ updated the criteria that applied to the FBC designated use and changed the microbiological indicator from fecal coliform to *E. coli* in the last triennial review, ADEQ did not revise the microbiological water quality criteria that applied to EDWs. ADEQ did not adopt *E. coli* criteria for EDWs because ADEQ did not want to suggest that water quality in EDWs was acceptable for the full body contact recreation use. However, the same rationale that supports revision of the FBC standards to *E. coli* applies equally to the revision of the current water quality standards for EDWs that currently are expressed in terms of fecal coliform concentrations. The microbiological water quality criteria for EDWs should be expressed as *E. coli* concentrations because *E. coli* is a better indicator of microbiological water quality and there is a stronger correlation between *E. coli* concentrations and swimming-related illness than with fecal coliform.

ADEQ made a policy decision prior to the last triennial review to maintain and protect microbiological water quality in EDWs at the same level as surface waters that are protected for full body contact recreation to protect human health and to provide a margin of safety. However, the state did not want to establish FBC as a designated use for the EDWs because it did not want to suggest that EDWs were suitable for swimming or other full body contact recreation activities. The proposed *E. coli* criteria to protect the FBC and PBC designated uses are the same (i.e., a 4-sample geometric mean of 126 cfu / 100 ml.). If the proposed criteria are adopted, then ADEQ can retain the PBC designated use for EDWs and also retain a level of microbiological water quality that is equivalent to FBC.

Finally, all EDWs that are listed in the surface water quality standards rules are protected by the PBC designated use. If ADEQ adopts the proposed *E. coli* criteria for the PBC designated use in this triennial review and does not repeal the current fecal coliform criteria that apply to EDWs, then EDWs will have microbiological water quality standards that are expressed as fecal coliforms and *E. coli*. Wastewater treatment plants that discharge to EDWs will be required to conduct discharge monitoring for fecal coliform and *E. coli*. Two different microbiological water quality standards to protect human health in EDWs are unnecessary. The current fecal coliform criteria for EDWs can and should be repealed to eliminate redundant monitoring requirements.

d. Repeal of fecal coliform for the domestic water source, aquatic and wildlife, agricultural irrigation, and agricultural livestock watering designated uses

ADEQ proposes to repeal the fecal coliform criteria that have been established to protect the domestic water source (DWS), aquatic and wildlife designated uses (A&W), agricultural irrigation (AgI), and agricultural livestock watering (AgL) designated uses. ADEQ proposes to repeal these criteria for several reasons.

First, the fecal coliform criteria for the DWS, A&W, AgI, and AgL designated uses will be superseded by more stringent *E. coli* criteria if the proposed criteria for the FBC and PBC designated uses are adopted. All surface waters in Arizona, with the exception of certain canals, have either a FBC or PBC designated use. Consequently, almost every surface water will be protected by the proposed *E. coli* criteria. Less stringent bacterial water quality standards for the DWS, A&W, AgI, and AgL designated uses will no longer be necessary.

Second, the scientific defensibility of the current fecal coliform criteria for the DWS, A&W, AgI, and AgL designated uses are questionable. There are no national criteria guidance recommendations for bacteria for the DWS, A&W, AgI, or AgL designated uses in the Gold Book. EPA only makes criteria recommendations for bacteria for freshwater bathing, marine bathing, and shellfish harvesting.

Third, previous EPA recommendations for water quality criteria for bacteria are inconsistent with the state's current fecal coliform criteria prescribed in the surface water quality standards rules. For example, in Water Quality Criteria, 1972, EPA recommended that the geometric means of fecal coliform and total coliform densities not exceed 2000 / 100 ml and 20,000 / 100 ml respectively for surface waters that were used as public water supplies (i.e., for the DWS designated use) after taking into consideration the treatment capabilities of water treatment plants. To ADEQ's knowledge, EPA has never recommended water quality criteria for bacteria for livestock watering or to maintain and protect water quality for aquatic life. The only rationale that ADEQ has found in previous EPA criteria documents that supports the current bacteria criteria is for agricultural irrigation. In 1972, EPA stated in the Blue Book that irrigation waters with a fecal coliform density of 1,000 fecal coliform organisms / 100 ml should contain sufficiently low concentrations of pathogenic microorganisms that no hazards to animals or man should result from the use or from consumption of raw crops irrigated with such water [See Water Quality Criteria, 1972, p. 351]. EPA's recommended Blue Book criterion is consistent with the current fecal coliform criterion for agricultural irrigation. ADEQ proposes to repeal this criterion because ADEQ thinks it will no longer be necessary if all surface waters in Arizona are protected by the proposed *E. coli* criteria for the FBC and PBC designated uses.

Expression of the E. coli criteria as geometric means and as single sample maximum concentrations

The proposed bacteria standards for *E. coli* are expressed as single sample maximum concentrations and geometric mean values. Both criteria must be met to support the FBC and PBC designated uses. The use of a geometric mean values in the proposed standards may cause some confusion regarding how compliance with the standards is determined. Confusion may arise because the proposed standard is expressed as a geometric mean (4 -sample minimum) and the current water quality standards for fecal coliform and *E. coli* bacteria are expressed as 30-day geometric means (5-sample minimum). That is, compliance with the current standard is based on a geometric mean of the sample results from a minimum of 5 samples taken within a 30-day period.

ADEQ did not include a reference to a 30-day averaging period in the proposed standards. EPA has explained in its Draft Implementation Guidance for the Ambient Water Quality Criteria for Bacteria-1986 that the reference to a minimum of 5 samples in a 30-day period in EPA's 1986 criteria recommendations for bacteria "is for accuracy purposes only" [See p. 21 of the Draft Implementation Guidance]. EPA and ADEQ agree that more frequent sampling for bacteria yields more accurate results when determining a geometric mean. However, EPA has clarified in its implementation guidance that it is the geometric mean *of the samples collected* in conjunction with the single sample maximum standard that determines attainment of the recommended *E. coli* criteria. In other words, the 30 -day averaging period is not a critical element of EPA's recommended criteria. For this reason, ADEQ amended the bacteria standards and removed the reference to a 30-day geometric mean. The proposed standard is simply expressed as a geometric mean (4 -sample minimum).

ADEQ and EPA both recommend that full body contact recreational areas be frequently monitored throughout the swimming season, particularly surface waters that are designated bathing areas, to ensure that human health is adequately protected. For example, there are some heavily used designated swimming areas in Arizona (such as Slide Rock State Park on Oak Creek) where frequent water quality monitoring for bacteria is recommended in the summer. Where frequent monitoring for bacteria occurs (e.g. daily), a geometric mean of the samples that are collected within a 30-day averaging period is appropriate. However, in surface waters that are infrequently used for full body contact recreation, less frequent water quality monitoring takes place and the use of a 30 -day averaging period is impractical. For example, ADEQ conducts monitoring of surface waters for bacteria as part of its ambient surface water quality monitoring program. ADEQ typically monitors quarterly for bacteria at sampling sites. Under the current standards, ADEQ cannot determine compliance with the 30 -day geometric mean (5-sample minimum) bacterial water quality standard. ADEQ does not take 5 samples within 30 days at any site as part of its ambient surface water quality monitoring program.

Under the proposed rule, compliance with the *E. coli* standard is based on a 4 -sample minimum geometric mean. If the rule is changed as proposed, ADEQ will be able to determine compliance with the standard based on 4 quarterly samples that are taken over the water year. For this reason, ADEQ amended the expression of the geometric mean standard in the proposed rules. The proposed bacterial water quality standard is expressed as a geometric mean concentration calculated from a minimum of 4 samples. The expression of the *E. coli* standard in this way does not preclude more frequent water quality monitoring or the use of 30-day averaging periods in NPDES permits or at places like Slide Rock State Park. However, the proposed amendment will permit ADEQ to determine compliance with bacterial water quality standards in surface waters that are infrequently used for full body recreation. ADEQ will be able to determine compliance from quarterly samples that are collected as part of the ambient surface water quality monitoring program. It should be noted that compliance with the single sample maximum criteria for *E. coli* is determined from the analytical results of a single grab sample.

Temperature [R18-11-109(E)]

R18-11-109(E) prescribes limits on the maximum allowable increase in the temperature of a receiving surface water due to a discharge. The current water quality standard states that a maximum increase of 3.0° C from a thermal discharge is allowed in a receiving water with the A&Ww and A&Wedw designated uses. A maximum increase of 1.0° C due to discharge is allowed to a receiving surface water with the A&Wc designated use. The water quality standards for temperature are intended to apply to point source discharges to perennial waters where the thermal component of the discharge is controllable. The temperature criteria are not intended to apply to discharges to ephemeral waters because the flow in an ephemeral water consists entirely of point and nonpoint source discharges of storm water runoff. The temperature of a storm water discharge is highly variable and uncontrollable. ADEQ proposes to revise footnote 4 to this water quality standard to clarify that the "maximum increase in temperature" standard does not apply to storm water discharges.

Repeal of the Current Numeric Turbidity Criteria [R18-11-109(F)]

ADEQ proposes to repeal the current turbidity criteria at R18-11-109(F). The current turbidity criteria are established to maintain and protect water quality for aquatic life designated uses (A&Wc, A&Ww, and A&Wedw). The current turbidity standards are as follows:

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- F. The following water quality standards for turbidity, expressed as a maximum concentration in nephelometric turbidity units (NTU) shall not be exceeded:

	A&Ww, A&Wedw	A&Wc
Rivers, streams, and other flowing waters	50	10
Lakes, reservoirs, tanks, and ponds	25	10

Turbidity is a qualitative measure of water clarity or opacity. Turbidity in water is caused by fine suspended particles such as clay, silt, organic and inorganic matter, plankton, and other microscopic organisms. Turbidity is an expression of the optical property that causes light to be scattered and adsorbed rather than transmitted in straight lines through a water sample. The measurement of turbidity, read in nephelometric turbidity units (NTUs), is an index of light refraction when light strikes suspended particles in the water. As a qualitative measurement, turbidity gives only a relative assessment of particulate loading in a surface water. Turbidity is a surrogate measurement for *estimating* the amount of suspended solids that are in water.

The source of the current turbidity criteria appears to date back to the first water quality standards adopted for surface waters in Arizona [See “Water Quality Standards for Surface Waters in Arizona,” State Department of Health, Water Quality Control Council (July 18, 1968)]. On July 18, 1968, the Water Quality Control Council (WQCC) adopted the following turbidity criteria to protect surface water quality for domestic and industrial water supply, recreation, and the protection of fish and wildlife:

Turbidity of the water will be maintained at the lowest practicable values possible, but in no case shall:

- a. Turbidity in the receiving waters due to the discharge of wastes exceed 50 Jackson units in warm water streams or 10 Jackson units in cold water streams.
- b. Discharge to warm water lakes cause turbidities to exceed 25 Jackson units, and discharge to cold water or oligotrophic lakes cause turbidities to exceed 10 Jackson units.

The original water quality standards for turbidity cited above appear to have been based on recommendations made in Water Quality Criteria, Report of the National Technical Advisory Committee to the Secretary of the Interior (April 1, 1968) (the “Green Book”). The Green Book recommendations for turbidity were based on research studies dating back to the 1930’s. (Ellis, 1937; Smith, 1940; Wallen, 1951; Buck, 1956; Tarzwell, 1957; Wagner 1959; Ziebell, 1960; Herbert and Merkens, 1961). One of the studies cited in the Green Book discussion of turbidity [Buck (1956)] actually supports the numeric criteria recommended by National Technical Advisory Committee. Buck investigated several farm ponds, hatchery ponds, and reservoirs over a 2-year period and observed that the maximum fish yield occurred in farm ponds where the average turbidity of the water was less than 25 Jackson units. Buck observed that fish yields decreased in farm ponds as turbidities increased to between 25 and 100 Jackson units and decreased again when turbidities exceeded 100 Jackson units.

Another possible source for the recommended 25 JTU turbidity criterion for warm water lakes may have been the precision of the method used for measuring turbidity at the time the Green Book recommendations were made. The instrument originally designed for the measurement of turbidity and in use in 1968 when the Green Book turbidity recommendations were made was the Jackson candle turbidimeter. The Jackson candle turbidimeter was a laboratory device that measured a combination of optical parameters such as light scatter, adsorption, and reflectance using the human eye as the detector. The unit of measurement was called a Jackson candle unit, Jackson candle turbidity number, or Jackson turbidity unit (JTU). According to Standard Methods for the Examination of Water and Wastewater, the lowest turbidity value that could be measured by the Jackson candle turbidimeter was 25 JTUs. More precise instruments for measuring turbidity, including nephelometers, have since been developed. The newer instruments for measuring turbidity use incandescent light sources instead of a candle and they use automated photocell detectors instead of the human eye. Formazin suspensions were later accepted as the standard for calibration of turbidimeters and the unit of measurement became the formazin turbidity unit, or FTU. Currently, the nephelometric turbidity unit (NTU) is used as the unit of measurement. A NTU refers to the amount of light that is scattered at 90° when a turbidimeter is calibrated with formazin.

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A comparison of the current turbidity criteria and the 1968 criteria shows that the numeric criteria have changed very little in over 30 years. Both sets of turbidity standards distinguish between streams and lakes and cold and warm surface waters. The only substantive change to the turbidity criteria in the last 30 years appears to be to the way that turbidity is measured. The units of measurement changed from Jackson turbidity units (JTUs) to nephelometric turbidity units (NTUs). However, the current numeric criteria for warm and cold water streams and lakes are the same as they were in 1968:

Comparison of 1968 and 1996 Turbidity Criteria

Type of surface water	1968	1996
Warm water streams	50 Jackson units	50 NTUs
Cold water streams	10 Jackson units	10 NTUs
Warm water lakes	25 Jackson units	25 NTUs
Cold water lakes	10 Jackson units	10 NTUs

ADEQ proposes to repeal the numeric water quality criteria for turbidity for several reasons:

1. The current numeric turbidity standards appear to be based upon Green Book criteria recommendations that were made in 1968. The scientific defensibility of the current turbidity criteria is questionable.
2. The current turbidity criteria are expressed as single sample maximum concentrations. In Arizona, with its variable climate and hydrology, a single sample maximum measurement of turbidity is scientifically indefensible. A single sample maximum does not account for the spatial and temporal variability in Arizona surface waters. Many variables can affect the suspended and settleable solids concentrations in a surface water. These variables include watershed size, land uses, slopes, precipitation intensity and duration, soil types, channel morphology, stream stability, and vegetative cover (to name just a few).
3. A single sample exceedance of the current turbidity standards is not correlated to impairment of aquatic life. There is no evidence that a one-time exceedance of the current turbidity criteria results in impairment of aquatic life designated uses.
4. Turbidity measurements are qualitative and they do not directly relate to the concentration of suspended solids in surface waters.
5. Turbidity data can be unreliable because of quality assurance / quality control problems associated with both field and laboratory measurements of turbidity. The laboratory measurement of turbidity in surface water may be unreliable because of exceedances of recommended sample holding times for turbidity analysis. Standard Methods recommends that water samples be analyzed in the laboratory on the same day that the sample is collected. Field measurements of turbidity are considered to be more reliable, but they may be affected by many variables including air bubbles; the sizes, shapes, and refractive characteristics of the particles that are suspended in the water; and differences in instrumentation. Standard Methods notes that variations of up to five times can result if different turbidimeters, all calibrated against the same standard, are used to measure the turbidity of a surface water.
6. According to Standard Methods, there is no direct relationship between the intensity of light scattered at a 90° angle (as measured in NTUs) and Jackson candle turbidity (JTUs). The absence of a direct relationship calls the current turbidity criteria into question because it appears that the units of measurement changed from JTUs to NTUs while the same numeric criteria that were adopted in 1968 have been maintained. In other words, because of fundamental differences between modern turbidimeters and the Jackson candle turbidimeter, results that are expressed in JTUs may not be equivalent to results expressed in NTUs (i.e., 50 NTUs \neq 50 JTUs).

For all of these reasons, ADEQ proposes to repeal the current numeric turbidity criteria. Instead, ADEQ will rely on 1) a numeric criterion for suspended sediment concentration to protect fish, 2) a narrative standard for suspended solids to protect water quality for domestic water source use, and 3) a narrative standard for bottom deposits to maintain and protect water quality for aquatic life.

Numeric suspended sediment concentration criteria to protect aquatic life

While ADEQ no longer supports the current turbidity criteria to protect aquatic life, ADEQ recognizes that the concentration of suspended solids in a surface water is an important water quality parameter because of the effect of suspended solids on light penetration, temperature, and on aquatic life. The importance of fluvial sediment to the quality of aquatic and riparian systems is well established. The U.S. Environmental Protection Agency identifies sediment as the single most widespread cause of impairment of the nation's rivers and streams, lakes, reservoirs, ponds and estuaries.

Suspended solids can affect several trophic levels and components of an aquatic ecosystem. For example, the EPA Water Quality Criteria 1986 document cites a report by the European Inland Fisheries Advisory Commission (EIFAC) which identifies 4 adverse effects of excessively high concentrations of suspended solids on fish. Excessively high concentrations of suspended solids:

- Act directly on fish swimming in the water in which solids are suspended, either by killing them or reducing their growth rate and resistance to disease;
- Prevent the successful development of fish eggs and larvae;
- Modify the natural movements and migrations of fish; and
- Reduce the abundance of food available to fish.

With regard to the effects of suspended solids on fisheries, EIFAC goes on to report that:

- There is no evidence that concentrations of suspended solids less than 25 mg / L have any harmful effects on fisheries;
- It should be possible to maintain good or moderate fisheries in surface waters that normally contain 25 to 80 mg / L suspended solids. However, the yield of fish from such waters may be lower than from those surface waters that have suspended solids less than 25 mg / L.
- Waters normally containing from 80 to 400 mg / L suspended solids are unlikely to support good fresh water fisheries, although fisheries may be found at the lower concentrations within this range.
- Only poor fisheries are likely to be found in waters that normally contain more than 400 mg / L suspended solids.

[See Water Quality Criteria 1972, A Report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences and National Academy of Engineering, Washington, D.C., 1972]

Increases in suspended solids concentrations in a surface water may negatively affect fish populations in other ways. As noted above, high concentrations of suspended solids act directly on fish and cause stress reactions, behavioral modifications, reduce resistance to disease, and clog and abrade gill membranes. High concentrations of suspended solids reduce light penetration in a surface water and this can adversely affect fish reproductive processes. Some fish species have strong visual components to their reproductive behavior. For example, researchers have found that largemouth bass spawning was delayed by as much as 30 days in turbid surface waters as compared to clear surface waters. Studies have shown that smallmouth bass populations shun potential spawning areas that are highly turbid. Reproductive failure among many fish species can be attributed to the direct loss of spawning habitat due to siltation of formerly clean substrates and the loss of vegetation due to reductions in the size of the photic zone. Suspended solids also can impair the ability of sight feeding fish to locate their prey. It also can cause modifications in the natural movements and migrations of fish.

Suspended solids can reduce the size of the photic zone in a surface water and the amount of light available to aquatic plants. A decrease in light penetration reduces photosynthetic activity and can result in a reduction of primary production in a surface water. A decrease in light penetration may affect the depth distribution of vascular plants and algae. Greatly reduced light penetration may shift the algal composition of a surface water from green algae to blue-green algae since the latter are more tolerant of higher levels of ultraviolet light. Zooplankton populations also may be reduced because of decreases in primary productivity. Zooplankton are a major source of food for fish and a reduction in their population can have an adverse effect on fish populations. In 1974, a National Academy of Sciences (NAS) committee recommended that the depth of light penetration in a surface water not be reduced by more than 10 percent and EPA's current recommended criterion for suspended solids appears to be based on this NAS recommendation. EPA's recommended criterion in the Water Quality Criteria 1986 document states:

Suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life.

ADEQ decided not to propose this recommended criterion as a surface water quality standard because ADEQ does not have reliable data on what the seasonal norms are for the depth of the compensation point for photosynthetic activity in Arizona surface waters. EPA's recommended criterion cannot be implemented without this baseline data. Instead, ADEQ proposes a numeric suspended sediment concentration criterion that is intended to protect fish in surface waters. The proposed standard is based upon earlier EPA criteria guidance for suspended solids recommended in the Water Quality Criteria, 1972 document and U.S. Geological Survey research recommending the use of analytical methods that measure the sedimented sediment concentration. In the criteria document, EPA states that aquatic communities should be protected if the following maximum concentrations of suspended solids exist:

- | | |
|--------------------------------|------------|
| • High level of protection | 25 mg / L |
| • Moderate protection | 80 mg / L |
| • Low level of protection | 400 mg / L |
| • Very low level of protection | 400 mg / L |

The recommended maximum concentrations of suspended solids cited above apply to surface waters that *normally* contain those levels of suspended solids. The EPA guidance document states there is no evidence of harmful effects on fisheries if the concentration of suspended solids in a surface water is usually below 25 mg / L. If the concentration of suspended solids is usually below 80 mg/L, it is possible to maintain good or moderate fisheries. EPA's recommended criteria are intended to apply to rivers and streams at or near base flow (i.e., a stream's "normal" flow regime). The EPA criteria document also notes that temporary high concentrations of suspended solids should be prevented in streams where good fisheries are to be maintained but that fish can tolerate high concentrations of suspended solids for short periods of time. Citing a study by Wallen (1951), the criteria document states that short-term behavioral reactions in fish were not observed until concentrations of suspended solids neared 20,000 mg / L and in one species reactions did not occur until suspended solids concentrations reached 100,000 mg / L. Most fish species that were tested endured exposures of more than 100,000 mg / L for a week or longer, but these same fishes finally died at suspended solids concentrations of 175,000 to 200,000 mg / L. Lethal concentrations caused the death of fishes within 15 minutes to 2 hours. This research suggests an approach to expressing numeric criteria for suspended sediment in Arizona surface waters.

The proposed numeric standard for suspended sediment is intended to protect fish populations. Thus, the proposed criteria are derived for the protection of aquatic and wildlife designated uses only. Arizona has 4 subcategories of aquatic life designated uses: A&Wc, A&Ww, A&Wedw, and A&We. However, ADEQ proposes that the new suspended sediment concentration criteria apply only to the A&Wc and A&Ww designated uses.

The proposed suspended sediment criteria should not apply to ephemeral waters (A&We) for two reasons. First, the proposed criteria are intended to protect fish and ephemeral waters do not support fish populations. Second, the proposed criteria are intended to apply at or near base flow conditions. Ephemeral waters are defined as surface waters that flow only in direct response to precipitation. There is no base flow in an ephemeral water. The “normal” flow regime of an ephemeral water is either no flow or high intensity, short-term flows associated with direct runoff from a precipitation event. An ephemeral water is normally a dry watercourse. Since the proposed criteria are intended to apply during a stream’s “normal” flow regime, they do not apply to ephemeral waters that have no flow except in direct response to a precipitation event.

The proposed suspended sediment criteria should not apply to effluent dependent waters (EDWs) for two reasons. First, the primary purpose of the proposed suspended sediment criteria is to protect fish populations. In most cases, EDWs either do not have fish populations or they have limited fish populations (e.g., mosquito fish). Second, and more importantly, EDWs are created by the discharge of treated wastewater from a wastewater treatment plant to an ephemeral water. Point source discharges of treated wastewater from a wastewater treatment plant to an EDW are regulated under the federal secondary treatment regulation [See 40 CFR, Part 133]. The federal secondary treatment regulations establish technology-based effluent limits on the discharge of suspended solids from a wastewater treatment plant. Under 40 CFR § 133.102, the 30-day average of suspended solids cannot exceed 30 mg / L and the 7-day average cannot exceed 45 mg / L. In addition, federal secondary treatment regulations require a wastewater treatment plant to achieve a 30-day average percent removal of suspended solids of 85%. These technology-based requirements are more stringent than the proposed water quality criteria for suspended sediment. ADEQ will rely on the secondary treatment regulations to provide effective control over the discharge of suspended solids to EDWs.

It is clear from EPA's criteria recommendations for suspended solids in the Blue Book that criteria recommendations are intended to be chronic criteria. The recommended criteria are intended to protect fish from chronic or long-term exposures to suspended solids in surface waters. The rationale in the Blue Book supporting EPA's recommended criteria states that fish can withstand much higher acute or short-term exposures to suspended solids. For this reason, ADEQ proposes to express the suspended sediment criteria as an average value (4 -sample minimum) that must be achieved in a stream at or near base flow conditions (i.e., the stream's "normal" flow regime). Water that flows in a surface water consists of a base flow fraction made up of ground water that infiltrates into a stream channel and a direct runoff fraction that enters the drainage system during and soon after a precipitation event. The proposed criterion is intended to apply only at or near base flow in a stream and not during storm events. Sample results that are taken in a stream during or soon after a precipitation event should not be used to determine compliance with the proposed suspended sediment criterion.

Finally, the proposed criteria are expressed as a suspended sediment concentration (SSC). The SSC analytical method, ASTM D 3977-97, Standard Test Method for Determining Sediment Concentration in Water Samples, is the U. S. Geological Survey (USGS) standard method for determining concentrations of suspended material in surface water samples. The method is used by all USGS sediment laboratories and by cooperating laboratories certified to provide suspended sediment data to USGS. The SSC is the most accurate way to measure the total amount of suspended material in a water sample collected from a surface water. Recent studies on the accuracy of the SCC analytical method by ASTM and the U.S. Geological Survey Branch of Quality Systems (Gordon and others, 2000) have shown that the SCC analysis represents a more accurate and reliable measure of the concentration of suspended sediment in a surface water sample. Other measurements, such as total suspended solids and turbidity, may be less expensive to collect or analyze but they result in unacceptably large errors and are fundamentally unreliable.

Differences between total suspended solids (TSS) and suspended sediment concentration analyses were investigated recently by the U.S. Geological Survey [See Gray, John R. et. al, Comparability of Suspended Sediment Concentration and Total Suspended Solids Data, Water Resources Investigation Report 00-4191, U. S. Department of the Interior, U.S. Geological Survey, August, 2000]. The USGS investigated differences in the data produced by TSS and SSC analyses by studying 3,235 paired TSS and SSC samples and 14,466 data pairs from the USGS NWIS database. The USGS concluded from the statistical analyses of the paired samples that the data produced by the SCC technique is more reliable than data produced by TSS analysis. The conclusions of this USGS study can be summarized as follows:

- TSS analysis is normally performed on an aliquot of the original water sample. The difficulty in withdrawing an aliquot from a sample that truly represents suspended material concentration leads to inherent variability in the measurement. By contrast SCC analysis is performed on an entire water sample, thus measuring the entire sediment mass in the sample. The analytical procedures for SCC and TSS differ and at times produce considerably different results, particularly when sand-size material composes a significant percentage of the sediment in a sample.
- TSS methods and equipment differ among various laboratories whereas SSC methods and equipment used by USGS sediment laboratories are consistent and are quality assured by the National Sediment Laboratory Quality Assurance Program.
- Results of the TSS analytical method tend to produce data that are negatively biased by 25% to 34% with respect to SCC analyses collected at the same time and can vary widely at different flows at a given site. The biased TSS data can result in errors in sediment load computations of several orders of magnitude.

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For the reasons stated above, ADEQ proposes the following criterion expressed as a suspended sediment concentration:

- D. The following water quality standard for suspended sediment concentration, expressed as an arithmetic mean (4 sample minimum), shall not be exceeded. The criterion applies to a surface water that is at or near base flow and does not apply during or soon after a precipitation event:

A&Wc, A&Ww

80 mg/L

Nutrient criteria [R18-11-109(H)]

R18-11-109(H) prescribes water quality standards for total phosphorus and total nitrogen for a number of major rivers, their tributaries, and lakes in Arizona. The listed streams include the Verde River, Salt River, Little Colorado River, Colorado River, and the San Pedro River. The lakes include Roosevelt, Apache, Canyon, and Saguaro lakes. The current criteria for nutrients are expressed as annual means, 90th percentile values, and single sample maximum concentrations. ADEQ does not propose to change the current nutrient criteria in this triennial review. However, ADEQ expects that the development of revised nutrient criteria for streams and lakes will be a major issue in the next triennial review.

An initiative to address nutrient enrichment problems in the nation's waters was published in the Clean Water Action Plan in February, 1998. The Clean Water Action Plan states that EPA will establish numeric criteria recommendations for nutrients (i.e., nitrogen and phosphorus) in 2000. The federal nutrient criteria recommendations are to be tailored to reflect different types of water bodies (e.g., lakes, rivers, and estuaries) and different ecoregions of the country. The Clean Water Action Plan states that EPA will assist states to adopt numeric water quality standards for nutrients based on the EPA's criteria recommendations. EPA expects to develop numerical ranges for acceptable levels of nitrogen and phosphorus in surface waters based upon the water body type and the region of the country in which the surface water is located. EPA also expects the states to adopt numeric water quality standards for nutrients within 3 years of EPA issuance of recommendations for nutrient criteria. EPA has stated its intention to federally promulgate nutrient criteria if a state fails to adopt a water quality standard for nutrients appropriate to their region and water body types.

EPA recently published notice of the availability of 17 ecoregional nutrient criteria documents for lakes, streams and rivers, and wetlands in 8 ecoregions in the United States. In the notice of availability of the nutrient criteria documents, EPA restated its expectation that the states will use the ecoregional nutrient criteria recommendations as "starting points" to identify more accurate, site-specific nutrient criteria for surface waters located within the states. EPA expects states to develop a plan for the development of numeric nutrient criteria for its surface waters by the end of 2001 and to adopt or revise numeric nutrient criteria for surface waters by 2004.

Salinity of the Colorado River [R18-11-110]

R18-11-110 prescribes flow-weighted average annual salinity standards for three control points on the lower Colorado River. R18-11-110 requires that the flow-weighted average annual total dissolved solids concentration be maintained at or below 723 mg/L below Hoover Dam, 747 mg/L below Parker Dam, and 879 mg/L at Imperial Dam. ADEQ proposes to retain these salinity standards without change in this triennial review.

Arizona's numeric salinity standards are based upon water quality standards for salinity recommended by the Colorado River Basin Salinity Control Forum (Forum). The Forum conducts its own triennial review of the water quality standards for salinity. On May 27, 1999, the Forum approved the "Report on the 1999 Review, Water Quality Standards for Salinity, Colorado River System (June, 1999)." On October 27, 1999, the Forum approved a Supplemental Report to its 1999 Review. The 1999 Review and the Supplemental Report constitute the Forum's triennial review of the water quality standards for salinity of the Colorado River system. The Forum's final report and supplement were transmitted to Governor Hull by letter dated December 3, 1999 urging prompt state adoption of the Salinity Control Forum's salinity criteria and the plan of implementation by Arizona's water quality control agency.

The Forum recommended no change to the current numeric salinity criteria that have been established for the 3 control points on the Colorado River at Hoover, Parker, and Imperial dams. These criteria are incorporated into Arizona's surface water quality standards rules in R18-11-110. No change has been made to the numeric salinity criteria since their original adoption by the Forum in 1975. ADEQ reviewed the Forum's 1999 Review and concurs that there is no need to modify the numeric criteria for salinity that are in R18-11-110 in this triennial review.

The Forum's water quality standards for salinity consist of the numeric salinity criteria and a plan of implementation for salinity control for the Colorado River system. The plan of implementation is designed to meet the objective of maintaining the salinity concentrations at or below the numeric criteria at the three stations located on the lower mainstem of the Colorado River. The legal basis for the inclusion of a plan of implementation as an element of the Forum's water quality standards for salinity appears to date back to the Water Quality Act of 1965. Water quality standards initially appeared in §5 of that Act. Under the Water Quality Act of 1965, water quality standards consisted of 3 basic elements: 1) a designated use, 2) water quality criteria expressed in numeric or narrative form sufficiently stringent to protect the designated use, and 3) a plan of implementation and enforcement of the water quality criteria [See §10(c)(1), 79 Stat. 907, 33 U.S.C. §1160(c)(1) (1965)]. The inclusion of a plan of implementation as a required element of water quality standards was deleted in the Clean Water Act of 1972. §303(c) of the Clean Water Act removed the plan of implementation as a required element of water quality standards [See *EDF v. Costle*, 657 F.2d 275 (D.C.Cir. 1981)].

While a plan of implementation is not a required element of a state water quality standards under §303(c), ADEQ proposes to amend R18-11-110 to incorporate by reference the Forum's plan of implementation for salinity control. The plan of implementation includes: 1) completion of Bureau of Reclamation, Bureau of Land Management (BLM), and U.S. Department of Agriculture salinity control measures to the extent that each unit remains viable and cost-effective, 2) implementation of the Forum's recommended policies for effluent limitations, principally under the NPDES permit program. These policies include the following: "Policy for Implementation of Colorado River Salinity Standards Through the NPDES Permit Program," "Policy for the Use of Brackish and / or Saline Waters for Industrial Purposes," "Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Intercepted Ground Water," and "Policy for Implementation of the Colorado River Salinity Standards Through the NPDES Permit Program for Fish Hatcheries," and 3) implementation of nonpoint source management plans developed by the states and approved by EPA. These policies are designed to ensure compliance with the numeric criteria for salinity at the control points on the lower Colorado River. During each triennial review of the Forum's water quality standards for salinity, the numeric criteria for salinity are reviewed and the plan of implementation is updated as necessary to ensure compliance with the numeric criteria.

The Colorado River water quality standards for salinity and the approach taken by the basin states to salinity control are unique. Arizona strongly supports the efforts of the Forum and its salinity control activities in the Colorado River basin, including the plan of implementation. For this reason, ADEQ proposes to add a subsection (B) to R18-11-110 to adopt the plan of implementation for salinity control:

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 set forth in subsection (A), the Department adopts the plan of implementation contained in the "1999 Review, Water Quality Standards for Salinity, Colorado River System," Colorado River Basin Salinity Control Forum (June, 1999) which is incorporated by reference and on file with the Office of the Secretary of State and the Department.

Unique Waters [R18-11-112]

R18-11-112 prescribes the rules that govern the state's unique waters program. A unique water is a surface water that ADEQ has determined to be an outstanding state resource water. Currently, there are 10 unique waters in Arizona:

1. West Fork of the Little Colorado River above Government Springs
2. Oak Creek, including the West Fork of Oak Creek
3. Peebles Canyon Creek, a tributary to the Santa Maria River
4. Burro Creek, above its confluence with Boulder Creek
5. Francis Creek, in Mohave and Yavapai counties
6. Bonita Creek, a tributary to the upper Gila River
7. Cienega Creek, from I-10 to the Del Lago Dam in Pima County
8. Aravaipa Creek, from the confluence with Stowe Gulch to the downstream boundary of the Aravaipa Canyon Wilderness Area.
9. Cave Creek and the South Fork of Cave Creek, in the Chiricahua Mountains, and
10. Buehman Canyon Creek, a tributary to the San Pedro River.

Unique waters are given stringent surface water quality protections under R18-11-107(D), the state antidegradation rule. R18-11-107(D) states:

Tier 3: Existing water quality shall be maintained and protected in a surface water that is classified as a unique water or that the Director has proposed for classification as a unique water pursuant to R18-11-112. The Director shall not allow limited degradation of a unique water pursuant to [R18-11-107(C)].

Under Arizona's current antidegradation implementation guidelines, any proposed activity that results in a new or expanded discharge of pollutants directly to a unique water is prohibited. For example, a new or expanded point source discharge of pollutants (e.g., a new wastewater treatment plant) directly to a unique water is prohibited by the state's Tier 3 antidegradation policy. The antidegradation implementation guidelines also prohibit a new or expanded discharge of pollutants to a tributary to a unique water if the discharge would cause degradation of existing water quality in the downstream unique water. A unique waters classification also can affect land use activities within a unique waters watershed. Land use activities that cause nonpoint source pollution are not exempt from the provisions of Arizona's Tier 3 antidegradation policy. For example, cattle grazing, mining, timber harvesting, agriculture, and other land uses that result in the nonpoint source discharge of pollutants to a surface water could be affected by a unique waters classification. Once a surface water is classified as a unique water, land use activities in the watershed have to be conducted in a way that prevents the degradation of existing water quality in the unique water. While Arizona does not have a regulatory program to directly control nonpoint sources of pollution, the intention of the Tier 3 antidegradation policy is that best management practices be developed and implemented to prevent the degradation of existing water quality in a unique water.

ADEQ classifies surface waters as unique waters by rulemaking. To classify a surface water as a unique water, ADEQ must go through the rulemaking process to amend R18-11-112 to add a new unique water to the list of 10 unique waters in R18-11-112(E). The legal requirements for the rulemaking process are prescribed in the State Administrative Procedures Act. Those requirements must be followed to classify a surface water as a unique water [See R18-11-112(A)]. Rulemaking to classify a unique water usually takes place as part of the triennial review of the surface water quality standards rules.

Under R18-11-112, any person may nominate a surface water for classification as a unique water. The current rule outlines the nomination process in R18-11-112(B). A person who wants to nominate a surface water for unique waters classification must submit a nomination to ADEQ. The nomination must include: 1) a map and description of the candidate unique water, 2) a written statement in support of the nomination that includes a specific reference to one of the two grounds for unique water classification, 3) supporting evidence that one or more of the grounds for classification is met, and 4) available water quality data relevant to establishing baseline water quality conditions for the proposed unique water.

ADEQ may classify a surface water as a unique water if it meets one of the following criteria:

1. The surface water is of exceptional recreational or ecological significance because of its unique attributes, including but not limited to attributes related to the geology, flora, fauna, water quality, aesthetic values, or wilderness characteristics of the surface water, or
2. Threatened or endangered species are known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species, or the surface water provides critical habitat for a threatened or endangered species.

The Director has discretion to classify unique waters. R18-11-112(D) states that the Director *may* classify a surface water as a unique water if the Director finds that one or both of the grounds for classification are met. However, ADEQ is not required to classify a nominated surface water as a unique water even if it meets one of the 2 grounds for unique waters classification stated above. There are no guidelines in the current rule to guide the exercise of the agency's discretion in making this decision.

ADEQ proposes to prescribe more specific eligibility criteria for a unique waters classification. The current grounds for unique water classification are broad and general, especially the ground that provides for unique classification if a surface water is determined to be "of exceptional recreational or ecological significance because of its unique attributes." [See R18-11-112(D)(1)]. While the current rule provides examples of the types of unique attributes that may be considered by the ADEQ (i.e., geology, flora, fauna, water quality, aesthetic values, or wilderness characteristics), there are no criteria or guidelines in the rule for determining what constitutes *exceptional* recreational or ecological significance.

ADEQ proposes to establish new requirements for a surface water that must be satisfied before it can be considered eligible for a unique waters classification. The proposed eligibility requirements are modeled on the eligibility requirements for rivers under the federal Wild and Scenic Rivers Act (Pub. L 90-542 as amended, 16 U.S.C. 1271-1287). The Wild and Scenic Rivers Act appears to be one of the sources for the attributes listed in the “exceptional recreational or ecological significance” ground for unique waters classification. In fact, two of the attributes listed as examples in R18-11-112(D)(1), “wilderness characteristics” and “aesthetic values,” are synonyms for “wild and scenic.” The statement of intent in the preamble to the Wild and Scenic Rivers Act could serve as a mission statement for the state’s current unique waters program. The preamble to the Wild and Scenic Rivers Act states:

It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, *possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values*, shall be preserved in free flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.

This language is similar to language used in “exceptional recreational and ecological significance” ground for unique waters classification at R18-11-112(D)(1). R18-11-112(D)(1) states that a surface water may be classified as a unique water if the Director finds:

The surface water is of exceptional recreational or ecological significance because of its unique attributes including but not limited to, attributes related to geology, flora, fauna, water quality, aesthetic values, or the wilderness characteristics of the surface water.

ADEQ proposes to add several eligibility requirements to the unique waters rule that are based on the Wild and Scenic Rivers Act. First, the proposed rule clarifies that a surface water must be perennial to be eligible for a unique waters classification. That is, a surface water must flow continuously throughout the entire year. Ephemeral waters and intermittent surface waters are ineligible for unique waters classification under the proposed rule.

Second, a surface water must be “in a free-flowing condition” to be eligible for a unique waters classification. “Free-flowing” means that a nominated surface water does not have impoundments, diversions, channelization, rip-rapping, or other hydrological modifications within a nominated surface water reach. In applying this eligibility criterion, the fact that a nominated surface water flows between impoundments does not necessarily preclude its satisfying the “free-flowing condition” eligibility requirement. Surface waters that flow between impoundments may be considered to be “free-flowing” provided conditions within the nominated reach meet the requirements stated above. For example, the Colorado River flows between several large impoundments in Arizona and the flow of the river is regulated by dams. The Colorado River between Lake Powell and Lake Mead would be considered “free-flowing” and eligible for unique waters classification because there are no impoundments, diversions, channelization, or other hydrological modifications within the reach of the Colorado River between the two lakes. Even though the flow of the river is regulated, it still satisfies the “free-flowing” eligibility requirement. An effluent dependent water would be ineligible for unique waters classification because ADEQ does not consider an EDW to be “in a free-flowing condition” since it is entirely dependent on the point source discharge of treated wastewater.

Third, ADEQ proposes to require that a surface water have exceptional water quality in order to be eligible for a unique waters classification. Water quality must meet or exceed applicable water quality standards that have been established for recreation in and on the water and for the propagation of aquatic life to be eligible for unique waters classification. A surface water that is identified as an impaired surface water under §303(d) of the Clean Water Act would be ineligible for unique waters classification under the proposed rule. It should be noted that the adoption of this requirement will require the collection of water quality data at some point in the unique waters classification process to determine baseline water quality. The current rule requires a nominating party to submit *available* water quality data relevant to establishing baseline water quality of a proposed unique water. ADEQ proposes to retain this requirement and does not propose to require that nominating parties collect data on existing water quality and submit that data as part of a nomination. ADEQ recognizes that a requirement to collect water quality data would impose a significant cost on nominating parties. Nonetheless, the collection of data on existing water quality is critically important to providing Tier 3 antidegradation protection and to the practical implementation of the unique waters program. The primary benefit of a unique water classification is the maintenance and protection of existing water quality and prohibition against degradation under Tier 3 of the antidegradation rule. Tier 3 antidegradation protection cannot be provided without data on existing water quality. If existing water quality data is unavailable for a nominated surface water, then it will have to be collected before a decision can be made on the proposal or the classification of a unique water.

Fourth, it must be shown in a nomination that at least one of the grounds for unique waters classification is satisfied. A nominating party must provide sufficient information in a nomination that demonstrates either: 1) a federally-listed threatened or endangered species is associated with the surface water and the surface water is essential to the maintenance and propagation of the species, or 2) the surface water provides critical habitat for a federally-listed threatened or endangered species, 3) the surface water is of “exceptional recreational ...significance” because of one or more outstanding attributes, or 4) the surface water is of “exceptional... ecological significance” because of one or more outstanding attributes.

Currently, R18-11-112(C) states that any person may nominate a surface water for consideration as a unique water by filing a petition for rule adoption with the Department. The current rule requires a person who nominates a surface water to submit a map and description of the surface water, a written statement in support of the nomination with specific reference to the applicable criteria for unique waters classification, supporting evidence demonstrating that 1 or more of the applicable criteria are met, and any available water quality data that is relevant to establishing baseline water quality of the proposed unique water. ADEQ sometimes receives nominations that do not provide enough information for ADEQ to make a decision on a unique waters classification, or the accuracy of the information provided in the nomination documents is uncertain or disputed, or the information provided is insufficient to provide a clear basis for findings of eligibility or classification.

ADEQ proposes to develop a substantive policy to provide specific guidance on the information requirements for unique waters nominations. A person who wants to nominate a surface water as a unique water will still have to provide a map and a description of the nominated surface water. The description of the surface water must include information or data which demonstrates that a nominated surface water is perennial. Second, the description of the surface water must include information upon which ADEQ may find that the nominated surface water is “in a free-flowing condition.” The description of the nominated surface water must describe any impoundments, diversions, channel modifications, flood control structures, bridges, road crossings, rip-rapping, or other hydrological modifications. Third, a nomination should include information on the current status of land ownership and existing land uses within 1/4 mile from each bank of the nominated surface water. ADEQ will require the submittal of information on land ownership and land uses in the riparian corridor to make a judgment regarding whether there is an ability to manage the nominated unique water for water quality purposes. Fourth, a nomination must include a description of the existing uses and the reasonably foreseeable potential uses of the land and water that may be enhanced by a unique waters classification and the existing and reasonably foreseeable potential uses that may be foreclosed or limited if a surface water is classified as a unique water. ADEQ will require the submittal of this information in order to make a judgment regarding the social and economic impact of a unique water nomination.

A nomination must include a detailed description of the characteristics that make the surface water a worthy addition to the unique waters program. If a surface water is nominated on the ground that threatened or endangered species are known to be associated with the surface water and existing water quality is essential to the maintenance and propagation of the threatened or endangered species, then the nomination must specifically identify the threatened or endangered species associated with the surface water and provide documentation that the species currently is listed as endangered or threatened by the Secretary of the Interior pursuant to §4 of the Endangered Species Act. The presence of candidate or sensitive species is insufficient to support a unique waters nomination. A nomination must include information upon which a finding can be made that a threatened or endangered species is known to occur in the specific area of the nominated surface water. A nomination must include citations to academic studies, scientific literature, or other references or sources of information that document the presence of a threatened or endangered species. If the presence of a threatened or endangered species is based upon a biological survey of a nominated surface water, the nomination must include a description of the survey methods that were used to establish the presence of a threatened or endangered species. At a minimum, the description of the biological survey must include a description of the survey area, who conducted the survey and their qualifications, the date the survey was conducted, and whether individuals or populations of threatened or endangered species were actually observed to occur. The presence of suitable habitat for a threatened or endangered species is insufficient by itself to support a unique waters nomination. If a surface water is nominated on the ground that it provides critical habitat for a threatened or endangered species, the nomination must include documentation that the nominated surface water is located within a specific geographic area designated as critical habitat by the Secretary of the Interior pursuant to §4 of the Endangered Species Act.

If a nomination is based, in whole or in part, on the ground of exceptional recreational significance, the nomination must include information on the estimated level of recreational use and the quality of the recreation experience provided by the nominated surface water. ADEQ proposes to use an assessment methodology developed for the Arizona River Assessment Project to evaluate exceptional recreational significance for the unique waters program. The Arizona River Assessment Project was initiated at the recommendation of Arizona's 1989 Statewide Comprehensive Outdoor Recreation Plan (SCORP). The Arizona River Assessment Project includes a methodology for evaluating surface waters as recreation resources. The methodology assigns streams into one of 5 classes for recreation: outstanding, substantial, moderate, limited, or unknown. These ratings are based on an assessment of the surface water's statewide significance as a recreation resource. An outstanding rating means the surface water is an exceptional recreational resource within the state as compared to other surface waters. An outstanding surface water provides one of the highest quality recreational experiences available within the state due to its unique combination of attributes or one or more specific characteristics that create an exceptional recreation opportunity. A substantial rating means that a surface water is an important recreational resource that represents one of the finer examples in the state in terms of providing a quality recreational experience. A moderate rating means that the surface water may be considered average or standard when compared to the recreational experiences provided by other surface waters within the state. A surface water that is rated moderate for a recreational activity is similar to many other surface waters in the state. A limited rating means that the recreational value of the surface water is limited. A surface water that is limited for a recreational activity either does not permit recreational activities or the surface water does not provide a quality recreational experience as compared to other surface waters in the state. An unknown rating means that information on the quality of the recreational opportunity provided by the surface water is unavailable.

ADEQ proposes to use the Arizona River Assessment Project methodology to make determinations of exceptional recreational significance. Surface waters that are assessed as being outstanding recreation resources using the Arizona River Assessment Project methodology will be considered for unique water designation. ADEQ proposes to require the submittal of information on the types, level of use, and the quality of water-dependent and stream corridor-related recreational activities, including fishing, motorized and non-motorized boating, water play (e.g. swimming, wading, tubing, and floating), camping, picnicking, hiking, nature study, motorized recreation, and visiting historic or cultural sites. ADEQ proposes to use standardized recreation assessment forms and the scoring system described in the Arizona Rivers Assessment Project methodology to determine if a surface water is of "exceptional recreational significance."

If a nomination is based, in whole or in part, on the ground that a surface water is of "exceptional ecological significance," the nomination must include information on the outstanding natural attributes that make the surface water "of exceptional ecological significance." ADEQ proposes to clarify the evaluation criteria that ADEQ will use to determine whether a surface water is of "exceptional ecological significance." Again, ADEQ proposes to use the Arizona Rivers Assessment Project evaluation system to assess whether surface waters are of exceptional ecological significance because of their riparian vegetation, fish, wildlife, stream hydrology, or geology.

A surface water may be of exceptional ecological significance because it has an outstanding riparian community associated with it. To make this determination ADEQ will require submittal of specific information about the plant species and plant communities associated with a surface water, the existing and potential extent or coverage of riparian vegetation, and a description of the ecological functions of the riparian corridor. ADEQ will use the following criteria to assess whether a surface water has an outstanding riparian community: the presence of threatened, endangered, and candidate plant species; the estimated length, width, and acreage of the riparian area or riparian community; the dominant vegetation community; species diversity; species scarcity; successional stage of the riparian community; relative predominance of natural (native) and introduced vegetation, and whether the riparian community is in proper functioning condition. Again, ADEQ proposes to use the Arizona River Assessment Project methodology to assess riparian functions and values.

A surface water may be of exceptional ecological significance because it is an outstanding fishery. If the fishery resource is cited as one of the grounds for a unique waters nomination, ADEQ will require submittal of information to assess whether the resource is an outstanding fishery of statewide significance. To make this determination, ADEQ will require submittal of specific information about the fish species present; the relative significance of the fish species present; population origin (i.e., native, reintroduced native, introduced, stocked), population size and sustainability; and the overall condition of the fish habitat provided by a nominated surface water. ADEQ will evaluate two broad categories of fish species: native fish and sportfish. Both categories of fish have resource values and should be evaluated independently. ADEQ proposes to adopt a checklist of 74 fish species used by the Arizona Game and Fish Department to help nominating parties inventory the fish species that are present in a nominated surface water. Native fish species significance will be based on the presence or absence of threatened, endangered, or candidate fish species in a nominated surface water and the extent of native fish predominance in the overall fish population. Sport fish significance will be evaluated on whether a fish species is rated as preferred, average, or of no value for fishing. ADEQ will require the submittal of information on the present population size and population trends (increasing, stable, or decreasing). ADEQ will require submittal of information on whether populations of fish are naturally-reproducing or hatchery-subsidized and whether populations are at or below levels that the surface water can reasonably support. ADEQ will require the submittal of information to make a general assessment of fish habitat based on parameters such as habitat diversity, cover, water quality, and water quantity. ADEQ also will require information on any special or unique habitat characteristics of the surface water, such as critical spawning areas, critical rearing or nursery areas, flooding or low flow refugia areas, exceptional or unusual habitat features such as oxbows, sloughs, backwaters, exceptional habitat diversity or a unique combination of habitat types, has a critical habitat designation, or is in a special research area.

A surface water may be of exceptional ecological significance because it is an outstanding wildlife resource. Again, ADEQ proposes to use the Arizona River Assessment Project methodology to assess whether a nominated surface water is of exceptional ecological significance. Wildlife habitat varies as much as do the animals themselves. It is impossible to do a detailed assessment of the habitat value of a nominated surface water for each species that may be present. However, a general assessment of a stream's overall habitat value to wildlife may be performed to determine whether a stream is of exceptional ecological significance.

Wildlife resource assessment criteria include two broad categories: species and habitat. As a first step in assessing species, ADEQ will require the submittal of information on the species for which the stream corridor segment provides significant habitat. ADEQ proposes to use the species list included in the Arizona River Assessment Project guidelines. A nominating party should focus on obligate and facultative riparian wildlife, especially the identification of species of special concern that are of statewide significance. For example, federal or state-listed threatened or endangered species, species proposed for listing, candidate species, species identified by state or federal agencies as species of special concern, and species that are of special local importance and uncommon throughout the state. Species significance is measured by rarity or perceived importance. Obviously, threatened or endangered species are given the highest statewide significance. Next in significance are species of special local importance and species that are uncommon throughout the rest of the state. Species that are common throughout the state would be considered less significant.

ADEQ will require submittal of information on habitat characteristics to make a determination whether a stream is of exceptional ecological significance. ADEQ will ask for information on special habitat characteristics, including: unique wildlife activity areas that are critical to some element of a species' life cycle; unusual or exceptional habitat features, designated critical habitat for federally-listed threatened or endangered species, other critical habitat for threatened, endangered, sensitive, or other species of concern, presence of designated wildlife areas, and special research areas. ADEQ will ask a nominating party to provide information on whether the habitat characteristics are improving, stable, or declining and some assessment of the habitat's recovery potential (at or near potential, recovery through natural systems alone, recovery with reasonable management assistance, recovery with intensive assistance, and no recovery potential). ADEQ will ask for a overall habitat value assessment of different habitat types (aquatic, marshes / wetlands, scrub lands, forests and woodlands) and whether the stream contains habitat that is of excellent or high quality, moderate quality, limited or low quality, none, or unknown.

ADEQ also will ask for information on habitat uniqueness or rarity. Rare or unique habitat is defined as one of the 5 - 10 best examples of the type in the state. Uncommon habitat is defined as not unique, but its scarcity is a limiting factor for certain valued species. All other habitat will be considered common. ADEQ will ask for information on habitat diversity based on the plant communities and vegetative structure, stream configuration, and physical structure within the nominated stream reach. Finally, ADEQ will require information on the confidence level of the information provided in making the assessment. ADEQ will require information on the amount and quality of data upon which wildlife determinations were based (i.e. Was a field survey of the reach conducted? Was the wildlife assessment based on general field knowledge or extrapolation? Best guess?)

A surface water may be of exceptional ecological significance because of its stream hydrology. Most of Arizona's streams are ephemeral waters that flow in direct response to precipitation or they are intermittent waters that flow seasonally. The duration of flow in a stream is a primary concern because of the proposed eligibility requirement that a unique water be perennial. Ephemeral and intermittent waters are ineligible for unique waters classification. To be eligible for a unique waters classification, a nominating party must provide documentation that the nominated surface water flows continuously throughout the year. This can be shown in two ways in a nomination. If empirical data is available from a USGS gaging station or other discharge monitoring, the mean monthly flow in cubic feet per second for each month of the year and the mean annual flow in cubic feet per second can be calculated and provided to ADEQ. If empirical data are unavailable, a nominating party can provide other information that a stream flows throughout the year. In the latter case, ADEQ will require information on the amount and quality of the data that supports an assertion that a stream is perennial (e.g. field observations over a period of record, modeling, best guess). Finally, ADEQ will require information on the existence of an in-stream flow right or applications for an in-stream flow right. Obviously, appropriations of surface water can have a significant effect on the volume of water flowing in a stream.

ADEQ will also require information on the flow regime and whether it is regulated or unregulated to determine whether the stream is "in a free-flowing condition." ADEQ will require submittal of information on the stream channel and the existence of hydrological modifications (e.g., dams, impoundments, diversions, canals, channel modifications, linings, armored banks, intakes and pumping stations, etc.)

ADEQ proposes to amend the part of the current rule which states that unique waters nominations are made by petitions for rule adoption [See R18-11-112(C)]. ADEQ believes that petitions for rule adoption unnecessarily accelerate the decision making process and short-circuits the careful study of surface waters nominated for unique waters classification. A unique waters rule should not impose unreasonably short time frames that result in ADEQ decisions on the eligibility and suitability of nominated surface waters on the basis of limited information. Rather, the nomination of a surface water for unique waters classification should start a careful review process that can be accomplished by ADEQ within agency resource and budget constraints and the larger time frame that applies to the triennial review of surface water quality standards.

Under the proposed rule, any person may still submit a nomination of a surface water for consideration as a unique water. However, the submittal of a nomination will not trigger the initiation of the rulemaking process in the triennial review. Instead, the nomination of a surface water will trigger an evaluation process by ADEQ that will take place outside of the triennial review of surface water quality standards. Nominations will be screened for completeness and ADEQ may solicit informal public comment on the nominations. The end product of this process will be a more structured assessment of the eligibility and suitability of a nominated surface water by ADEQ and a recommendation for non-inclusion or inclusion in the unique waters program through a proposed revision to the unique waters rule.

The rule should be amended to clarify the public participation procedures that are to be used during the unique waters classification process. While the current rule does not require public participation beyond the public participation requirements that apply to rulemaking, it has been ADEQ practice to hold at least one informal public meeting in the area where a nominated unique water is located to present the unique waters nominations to persons in the local community who will be most directly affected by a nomination and to solicit public comment. ADEQ believes that this element of the informal public participation process for unique waters classification should be included in the rule.

ADEQ proposes to add language to the rule to clarify that unique waters classifications will be considered only as part of the triennial review of surface water quality standards. ADEQ is proposing this clarification to conserve agency administrative resources. Informal and formal rulemaking activities are resource-intensive and they can take a long time to complete, sometimes years. It is more efficient for ADEQ to consider unique waters classifications during the triennial review of the surface water quality rules rather than in a separate rulemaking. Therefore, ADEQ proposes to add language to the rule to clarify that ADEQ will consider unique water classifications only during a triennial review.

There is a need to amend the rule to require consideration of whether there is an ability to manage a proposed unique water and its watershed to maintain and protect existing water quality. ADEQ believes that a management capability to maintain and protect existing water quality is an important factor in the decision to classify a unique water. The ability to manage for water quality was one of 3 primary criteria for designation of unique waters under the original unique waters policy for Arizona. The 3 primary designation criteria for a unique waters designation in the original policy were: 1) water quality is consistently better than water quality standards, 2) preservation of existing water quality is not in conflict with the present or anticipated necessary or justifiable economic and social uses of the watersheds consistent with appropriate planning such as §208 area wide water quality management plans or county and municipal plans, and 3) *the body of water and its watershed are capable of being managed to maintain the existing high water quality* [See “Arizona Water Quality Control Council Unique Waters Policy,” April 8, 1981, p. 2]. ADEQ proposes to amend R18-11-112 to reinstate these 3 decision criteria.

There is a need to specifically describe the criteria that ADEQ will consider when making decisions on unique waters nominations. Additional decision criteria are needed to guide the exercise of agency discretion in the decision making process. The current rule states only that the Director *may* classify a unique water. At a minimum, a surface water that is nominated for unique waters classification must meet eligibility requirements and at least one of the prescribed grounds for unique waters classification. However, once one of these two criteria is met, what factors should the agency consider before making a decision on a nomination? What factors should inform the exercise of the agency’s discretion on whether to classify a nominated surface water as a unique water? ADEQ believes that additional decision criteria are necessary to guide the exercise of ADEQ’s discretion in the decision making process. Other decision criteria that the Director may consider include:

- *Social and economic impact of Tier 3 antidegradation protection:* The Director may take into consideration the potential social and economic impact of a unique water classification and the establishment of Tier 3 antidegradation protection, including:
 - a. Impact of a prohibition of new point source discharges and expansion of existing point source discharges, including possible limits on discharges to the tributaries of a proposed unique water and possible impacts on growth and development.
 - b. Impact of possible future restrictions on land use activities in a unique waters watershed, including cattle grazing, timber harvesting, mining, recreation, and agriculture.
 - c. The impact of stricter requirements for §401 certification of federal permits and licenses, including NPDES and §404 permits.
 - d. Impact on private property rights and the potential for regulatory “takings.”
 - e. Ecosystem and preservation values.

ADEQ is required by law to classify unique waters by rule. One of the requirements of the rulemaking process is the preparation of an economic, small business, and consumer impact statement (EIS). Any rule establishing a new unique water is subject to review by the Governor’s Regulatory Review Council (GRRC). The GRRC cannot approve a rule establishing a new unique water unless there is a complete EIS, the EIS is “generally accurate,” and the probable benefits of a unique waters classification outweigh the probable costs of the rule. The Director may consider the availability of information to develop an adequate economic impact statement in making a decision on a unique waters nomination. Where information is available on the probable costs and benefits of a unique waters classification, the Director may take that information into account in making a decision whether to go forward with a unique waters proposal. Where probable costs of a unique waters classification outweigh the probable benefits, the Director may deny a nomination.

- *Public comments in support or opposition to a unique waters classification:* The Director will consider public comments and the degree of support or opposition to a unique waters classification. While a unique waters classification is not subject to a majority vote, ADEQ will carefully consider all of the public comments that are submitted on a proposed unique water. ADEQ will carefully consider the comments of the federal and state land management agencies that have primary responsibility for managing public lands where a proposed unique water is located. Such agencies may include the U.S. Forest Service, Bureau of Land Management (BLM), National Park Service, State Land Department, and Arizona State Parks. This decision criterion closely relates to the determination as to whether there is an ability to manage the proposed unique water and it recognizes the need for intergovernmental cooperation between ADEQ’s unique water program and federal and state land managers and other natural resource management agencies [e.g., U.S. Fish & Wildlife Service and Arizona Game and Fish Department].

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- *Location:* The Director may consider whether the proposed unique water is located within a National or State Park, National Monument, National Recreation Area, Wilderness Area, National Wildlife Refuge, Area of Critical Environmental Concern, Riparian National Conservation Area, or is designated or proposed for designation as a Wild and Scenic River.
- *Agency resource constraints:* A unique waters classification provides Tier 3 antidegradation protection [See R18-11-107(D)]. To make Tier 3 antidegradation protection meaningful, a water quality monitoring program must be implemented to determine existing water quality and whether degradation is occurring. The Director may consider whether there is an ability to monitor water quality in a proposed unique water before classifying it. ADEQ also will consider the potential for cooperative agreements with other agencies (USGS, USFS, BLM) and the availability of volunteer monitoring groups before making a decision to propose a surface water as a unique water.

Unique water nominations

ADEQ received nominations of 37 surface waters for consideration as unique waters in this triennial review. ADEQ held 6 public meetings in Alpine, Flagstaff, Casabel, Phoenix, and Globe to discuss the nominations with persons in locally affected communities. All 37 surface waters that were nominated were included in a set of preliminary draft rules that ADEQ distributed for public comment. ADEQ held 4 additional public meetings to take public comments on the rules, including the unique waters nominations. ADEQ considered all of the public comments that were received on the nominations before making a decision of which surface waters to formally propose for unique waters classification in this Notice of Proposed Rulemaking. ADEQ proposes the following 10 surface waters for classification as unique waters:

Little Colorado River watershed

1. Lee Valley Creek (above Lee Valley Lake)

Salt River watershed

2. Bear Wallow Creek
3. North Fork of Bear Wallow Creek
4. South Fork of Bear Wallow Creek
5. Snake Creek
6. Stinky Creek
7. Hayground Creek
8. West Fork of the Black River

Santa Cruz River watershed

9. Upper Cienega Creek

Upper Gila River watershed

10. KP / Cienega Creek

ADEQ decided to not propose the following surface waters that were nominated for unique waters classification:

Little Colorado River watershed

1. Dry Lake
2. Coyote Creek
3. Mamie Creek

Salt River watershed

4. Reavis Creek (Superstition Wilderness)
5. Pine Creek (Superstition Wilderness)
6. Tortilla Creek (Superstition Wilderness)
7. Fish Creek (Superstition Wilderness)

8. La Barge Creek (Superstition Wilderness)
9. Pinto Creek
10. Lower Haunted Canyon
11. Conklin Creek (Black River watershed)
12. Corduroy Creek (Black River watershed)
13. Double Cienega Creek (Black River watershed)
14. Fish Creek (Black River watershed)
15. Hannagan Creek (Black River watershed)
16. Boggy Creek (Black River watershed)
17. Centerfire Creek (Black River watershed)
18. Wildcat Creek (Black River watershed)
19. Home Creek (Black River watershed)
20. Reservation Creek (Black River watershed)
21. Soldier Creek (Black River watershed)

Upper Gila watershed

22. Coleman Creek (Blue River watershed)
23. Grant Creek (Blue River watershed)

San Pedro River watershed

24. Hot Springs Canyon
25. Bass Canyon
26. Redfield Canyon
27. Wildcat Canyon Creek

Pinto Creek unique water nomination

In August, 1999, Mr. Tom Sonandres, on behalf of the Friends of Pinto Creek, nominated a 8.8 mile segment of Pinto Creek for unique waters classification. Pinto Creek is a small, perennial stream that flows through the Sonoran desert in Gila County near Globe, Arizona. The nominated segment of Pinto Creek is located primarily within the Tonto National Forest. Pinto Creek is ephemeral in its upper reaches but it flows perennially in several reaches between its headwaters in the Pinal Mountains and Roosevelt Lake. The nominated segment of Pinto Creek extends from approximately the Pinto Valley Mine weir to the lower end of an area called the Pinto Box.

The nominated segment of Pinto Creek is perennial. This description is supported by stream flow or stream discharge information provided by the U.S. Forest Service in a preliminary analysis of Pinto Creek that was done to determine its eligibility for potential inclusion in the Wild and Scenic River system and by USGS Water Resources Data. The U.S. Forest Service described the nominated segment as being "mostly perennial" with a median flow over 5-year period of record of 2.1 cubic feet per second (cfs). USGS discharge records from October, 1994 - 1999 obtained from the stream gaging station at the Pinto Valley weir also indicate that the nominated section of Pinto Creek is perennial. The annual mean discharge in cubic feet per second ranges from .38 cfs to 27.3 cfs, the minimum discharge ranges from .01 cfs to 1.3 cfs, and the maximum discharge ranges from 19 cfs to 5010 cfs. Discharge data over the period of record indicate that the nominated segment of Pinto Creek is perennial even though there can be very low flow in the stream in dry years.

Pinto Creek was nominated for consideration as a unique water on the ground that the stream is of exceptional ecological significance because of the presence of perennial water in the Sonoran desert environment; the presence of more than 20 endangered, threatened, or sensitive species; its outstanding cottonwood-willow riparian corridor, and its geological features. Pinto Creek also was nominated for its outstanding scenic values. Pinto Creek supports a cottonwood-willow riparian community. The U.S. Forest Service identified Pinto Creek as having “outstandingly remarkable” ecological values because of its cottonwood-willow riparian community, described as the rarest riparian community on the Tonto National Forest. The U.S. Forest Service also identified Pinto Creek as having outstandingly remarkable riparian values based on a 1993 evaluation of the stream’s riparian condition. The condition of the riparian community was described as “only fair” on the upstream half of the segment of Pinto Creek that was being evaluated for eligibility and classification as a Wild and Scenic River. The condition of the riparian community in the lower half of the segment was described as good where no livestock grazing had occurred in several years. The Tonto National Forest also noted that the riparian area had high value as a benchmark for documenting the recovery of the rare cottonwood-willow riparian community and that the trend for the riparian community was improving. More recent information on the status of the riparian community for Pinto Creek was not included in the nomination other than a brief note reporting personal observations of the nominator that he observed dense thickets of young cottonwoods during a June, 1999 hike.

Pinto Creek was nominated for unique waters classification in part because Pinto Creek provides moderate to good riparian habitat for a variety of threatened, endangered, or sensitive species that may be present in the nominated segment. The availability of suitable habitat and the assertion that threatened or endangered species *may* be present are insufficient to support a unique waters classification under R18-11-112(D)(2). There is insufficient information in the nomination document for ADEQ to make a finding that threatened or endangered species are known to be associated with the surface water and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species. The only federally-listed endangered or threatened species identified in the nomination are the bald eagle, southwestern willow flycatcher, the lesser long-nosed bat, and the Arizona hedgehog cactus (the other identified species are either candidate or Forest Service sensitive species). The 4 federally-listed species that are identified are only weakly associated with Pinto Creek and there is no showing that the maintenance and protection of existing water quality is essential to the maintenance and propagation of the species. For example, the nomination document states that neither bald eagles or the southwestern willow flycatcher have been observed along Pinto Creek but that bald eagles may fly over lower Pinto Creek in search of prey and the southwestern willow flycatcher may find suitable habitat if willows recover from flooding to form dense thickets. The only information provided in the nomination document regarding the lesser long-nosed bat is a statement that the U.S. Fish & Wildlife Service believes that the bat may be in the area. The Arizona hedgehog cactus is only weakly associated with the Pinto Creek riparian community. Its habitat is described as the ecotone between interior chaparral and madrean evergreen woodlands. It grows on open slopes, in narrow cracks between boulders, and in the understory of shrubs. It is difficult to conclude that a unique waters classification of Pinto Creek is essential to the maintenance and protection of the Arizona hedgehog cactus given these habitat requirements. Moreover, the presence of threatened or endangered species in Pinto Creek is contradicted by conclusions of the final environmental impact statement (EIS) for the Carlota Mine Project. Extensive studies on the presence of threatened or endangered species were done as part of the EIS. The final EIS document concludes that special status wildlife species or other wildlife species of concern “are not located in the vicinity of the Carlota project area and / or suitable habitat is not present” [See p. 3-189 of the EIS]. It also should be noted that Pinto Creek has *not* been designated as a critical habitat under the Endangered Species Act for any federally-listed threatened or endangered species. For all of these reasons, Pinto Creek does not qualify for unique water classification on the basis of the presence of threatened or endangered species.

ADEQ has determined that Pinto Creek does not qualify for unique waters classification on the ground that the stream is of exceptional recreational significance. Public access to the nominated reach of Pinto Creek is limited. There are no developed recreation facilities or trails within the nominated segment. Recreational activities are limited to dispersed recreation activities such as hiking, nature study, picnicking, and horseback riding. In 1993, the Tonto National Forest estimated that only 1,500 recreation visitor days occurred within the area of the nominated segment annually. This level of recreational use does not support a finding that Pinto Creek is one of Arizona’s exceptional recreation resources.

The nomination document notes that Pinto Creek was included in a U.S. Forest Service study of rivers and streams potentially eligible for inclusion in the national Wild & Scenic Rivers System. In January, 1993, the U.S. Forest Service evaluated Pinto Creek in Preliminary Analysis of Eligibility and Classification for Wild / Scenic / Recreational River Designation Report. Resource information for Pinto Creek was published in a report entitled, Resource Information Report, Potential Wild / Scenic / Recreational River Designation, National Forests of Arizona, U.S. Department of Agriculture, U.S. Forest Service, Southwestern Region, September, 1993. Based on this preliminary analysis, the U.S. Forest Service found that Pinto Creek was eligible for inclusion in the national Wild & Scenic Rivers System as a scenic river and that it possessed outstandingly remarkable scenic, riparian, and ecological values. In fact, much of the information for the Friends of Pinto Creek nomination is taken from the resource information compiled by U.S. Forest Service. While a preliminary determination was made that Pinto Creek is eligible for inclusion in the Wild and Scenic Rivers system by the U.S. Forest Service, it has not been so designated.

The Pinto Creek watershed contains areas of known natural copper mineralization that have been exploited by past and present mining activities. Pinto Creek flows across the western margin of the historic Globe-Miami mining district, one of the major porphyry copper districts in the Southwest. Mining activities in the Pinto Creek watershed have created point and nonpoint source pollution sources that have contributed copper to Pinto Creek and its tributaries. These mining activities include open pit copper operations, several historic open-pit and underground operations, and hundreds of smaller adits, shafts, and prospects. Pinto Creek has been affected by numerous spills from the Pinto Valley Mine over the past 25 years, the latest resulting from a massive tailings failure in 1998. A remedial action under CERCLA was initiated against BHP Copper to clean up Pinto Creek.

Pinto Creek is listed by ADEQ under §303(d) of the Clean Water Act as a water quality-limited surface water for non-attainment of the surface water quality standard for dissolved copper. Under §303(d), a total maximum daily load (TMDL) analysis must be developed for all impaired surface waters on the §303(d) list. A draft TMDL for copper in Pinto Creek has been completed [See Total Maximum Daily Load for Copper in Pinto Creek, Arizona, Environmental Protection Agency and Arizona Department of Environmental Quality, Public Review Draft, July, 2000]. The geographic scope of the TMDL includes the entire Pinto Creek watershed from its headwaters to Roosevelt Lake, including the reach of Pinto Creek nominated for classification as a unique water.

ADEQ agrees with the nominators that Pinto Creek has important natural resource values because of the presence of perennial water and the relatively rare cottonwood-willow riparian community that the stream supports. However, ADEQ has decided not to propose Pinto Creek for unique waters classification. ADEQ decided not to propose Pinto Creek for unique waters classification primarily because the stream is water quality-limited for dissolved copper and the stream is listed on Arizona's §303(d) list. ADEQ believes that the current §303(d) listing is inconsistent with a unique waters classification. The unique waters program recognizes the state's outstanding state resource waters. By contrast, the TMDL program is intended to restore water quality in degraded surface waters to levels that achieve compliance with applicable water quality standards.

Lower Haunted Canyon unique water nomination

Mr. Tim Flood, on behalf of the Friends of Arizona Rivers, nominated a 0.7 mile segment of Lower Haunted Canyon for classification as a unique water in August, 1999. The nomination states that Lower Haunted Canyon is an outstanding state resource water of exceptional ecological and recreational significance because of its unique attributes, including its regional importance as a perennial stream in the Sonoran desert, its relatively good water quality, its biological uniqueness (particularly its high quality riparian vegetation and the presence of numerous species of insects, amphibians, fish, reptiles, birds and mammals), the stream's geomorphology (especially its relatively high percentage of pool habitat), and its scenic and aesthetic values.

ADEQ agrees that Lower Haunted Canyon is a valuable surface water resource that is ecologically significant as a perennial desert stream. However, ADEQ does not agree that the stream possesses the outstandingly remarkable and unique attributes that qualify it as one of Arizona's outstanding state resource waters of exceptional ecological significance. Lower Haunted Canyon may be a significant surface water resource on a local or even a regional scale, in ADEQ's best professional judgment, Lower Haunted Canyon does not possess outstanding attributes to set it apart as a surface water of statewide significance. No federally-listed threatened or endangered species are documented to occur in Lower Haunted Canyon, nor is it designated as a critical habitat for a threatened or endangered species. The nomination document notes that both exotic fish species and native fish species are present in Lower Haunted Canyon. The absence of threatened or endangered species and the presence of non-native fish species in Lower Haunted Canyon (e.g., green sunfish) suggests that the stream is representative of other small, desert streams. The nomination of Lower Haunted Canyon states that the stream provides suitable habitat for the Gila topminnow and Gila chub, two federally-listed endangered species. However, a finding that a surface water may provide suitable habitat is not, by itself, sufficient to support a unique waters classification. The presence of green sunfish in Lower Haunted Canyon suggests that active fishery management by the Arizona Game and Fish Department (AGFD) may be necessary for Lower Haunted Canyon to achieve its potential as a native fishery for the Gila topminnow or Gila chub. AGFD provided comments to ADEQ on the unique waters nominations and stated their concern that a unique waters designation may impair the AGFD's ability to manage the fishery resource. The AGFD notes in their comments that it is sometimes necessary to alter stream morphology to improve fish habitat (e.g., construction of fish barriers, stream bank stabilization, installation of check dams, etc.) or apply piscicides such as rotenone or antimycin to remove non-native fish to aid in the recovery of threatened and endangered species (e.g., eradication of green sunfish). While a unique waters classification does not necessarily preclude such activities, it may limit AGFD's fishery management options.

Lower Haunted Canyon does not qualify for unique waters classification on the ground that it is of exceptional recreational significance. Public use and access to the stream are limited. The nomination document itself notes that Lower Haunted Canyon is only a "lightly used recreational area." Moreover, an independent evaluation of Lower Haunted Canyon conducted as part of the Arizona Rivers Assessment Project described Haunted Canyon as being only a limited recreation resource that does not offer a high quality or unique recreational experience within the state when compared to other surface waters in the state.

Finally, ADEQ considered the comments of the U.S. Forest Service, the primary federal land management agency for the Tonto National Forest where Lower Haunted Canyon is located. The Tonto National Forest opposed the unique waters classification for Lower Haunted Canyon because it may interfere with mitigation measures agreed to by the U.S. Forest Service, the Carlotta Copper Company, U.S. Environmental Protection Agency, Arizona Department of Water Resources, U.S. Army Corps of Engineers, and ADEQ in the final Environmental Impact Statement (EIS) for the Carlotta Mine Project. One of the mitigation measures (WR-3 in the final EIS) developed by the Tonto National Forest and agreed to by the Carlotta Copper Company is a measure to maintain stream flow in Haunted Canyon. The mitigation measure calls for diverting water from a water supply well field and discharging it to Haunted Canyon. Water quality data provided from the water supply well field indicates that the groundwater has a similar water chemistry to surface water in Haunted Canyon. However, some differences in water quality exist that could make it difficult to comply with Tier 3 antidegradation requirements. The classification of Lower Haunted Canyon as a unique water could be counterproductive because it could impair the ability to implement the wellfield mitigation program to preserve existing stream flow in Lower Haunted Canyon. The principal ground for the nomination of Lower Haunted Canyon as a unique water is its outstanding riparian vegetation and stream hydrology. The maintenance of flow in Lower Haunted Canyon is essential to maintaining this riparian community. A unique waters classification that interferes with the implementation of a strategy to preserve in-stream flows in Haunted Canyon may do more harm than good. For this reason, ADEQ chose not to propose Lower Haunted Canyon for unique water classification.

Forest Guardians Nominations

The Forest Guardians White Mountain Conservation League ["Forest Guardians"] nominated all of the Apache trout streams in the Black River, Blue River, and Little Colorado River watersheds for unique waters classification. Forest Guardians nominated 22 streams in 3 watersheds primarily on the ground that the streams support populations of threatened, endangered, and sensitive wildlife species, particularly the Apache trout. Forest Guardians also recommended the 22 streams on the ground that the surface waters provide important recreational opportunities such as hiking, birding, nature study, camping, hunting, fishing, and horseback riding.

ADEQ does not disagree that nominated surface waters have important recreational values, but the nominations provide insufficient information upon which ADEQ could find that the nominated surface waters represent surface waters that present exceptional recreational opportunities of statewide recreational significance.

Forest Guardians recommended the 22 surface waters primarily because of the presence of a number of endangered, threatened, and sensitive species. Many of the species listed in the nomination documents are identified as sensitive bird, terrestrial, or plant species and there is no information to show that the maintenance of existing water quality in the nominated surface waters is essential to the maintenance and propagation of the endangered, threatened, or sensitive species.

ADEQ considered public comments that were made in support and in opposition to the Forest Guardians nominations. In particular, ADEQ carefully considered the comments of the Apache Sitgreaves National Forest [ASNF], the federal agency with management authority over the public lands where the nominated surface waters are located. In 1994, the U.S. Forest Service conducted biological assessments and evaluations for an Apache Trout Habitat Improvement Project within the ASNF. The biological assessments provided information used to develop the current Apache Trout Recovery Plan for the ASNF. These assessments appear to be a principal source of information used by Forest Guardians in the nominations.

The ASNF does not support the nominations of Conklin Creek, Corduroy Creek, Double Cienega Creek, Fish Creek, Hannagan Creek, Boggy Creek, Centerfire Creek, Wildcat Creek, Home Creek, Reservation Creek, or Soldier Creek in the Black River watershed. The ASNF does not support the nominations of Coleman Creek and Grant Creek in the Blue River watershed. Finally, the ASNF does not support the nominations of Coyote Creek and Mamie Creek in the Little Colorado River watershed. The reasons ASNF provided for not supporting an individual nomination are various, but they include the following: 1) The stream does not provide exceptional Apache trout habitat or it only provides limited Apache trout; 2) the stream is an intermittent stream; 3) The stream is impacted by roads or other nonpoint sources of pollution, and 4) the stream is partly on the Fort Apache Indian Reservation and the state and ASNF have no regulatory or management authority on tribal lands.

The ASNF supports the nominations of the following surface waters for unique waters classification:

1. Bear Wallow Creek (including the North and South Forks) - because it is located within the Bear Wallow Wilderness area and the stream provides high quality Apache trout habitat.
2. Snake Creek - because the stream is currently in good condition and provides exceptional Apache trout habitat.
3. West Fork of the Black River - (headwaters to West Fork campground) because the headwaters are considered to be in an unaltered watershed condition and it provides high quality Apache trout habitat within the ASNF.
4. Hayground Creek - because the stream is currently in good condition and has the potential of becoming exceptional Apache trout habitat. Much of the stream falls within the Hayground Research Natural Area.
5. Stinky Creek - because road closures and exclusionary fencing have improved this stream to good condition.
6. KP / Cienega Creek - because the stream is currently in good condition and has the potential of becoming exceptional habitat for Apache trout. Also, the stream has been designated to be a Gila trout recovery stream.
7. Lee Valley Creek - because it currently is in good condition and has the potential of becoming exceptional habitat for Apache trout. Its headwaters are in the Mt. Baldy Wilderness Area and cattle grazing has been eliminated from the reach.

ADEQ did not propose any surface water for unique waters classification that was not supported by the ASNF. ADEQ proposes to classify the surface waters listed above as unique waters in this triennial review because of the presence of the endangered Apache trout or the streams provide exceptional habitat for the Apache trout. Also, each of the above nominations are supported by the ANSF and the Arizona Game and Fish Department. Moreover, the nominated surface waters are capable of being managed to maintain existing water quality.

Forest Guardians Superstition Wilderness Nominations

Forest Guardians nominated 5 streams in the Superstition Wilderness Area for classification as unique waters. The 5 streams are Reavis Creek, Pine Creek, Tortilla Creek, Fish Creek, and LaBarge Creek. Forest Guardians nominated the 5 streams because they provide habitat for a variety of wildlife species and because most of the riparian corridors are in a healthy, proper functioning condition. The nomination document does state that some of the riparian areas along these streams show impacts from past overgrazing. For example, Tortilla Creek is described as having been subjected to heavy livestock concentrations in the past. The nomination states that threatened, endangered, and sensitive wildlife are associated with the 5 streams and that they “rely on the wooded areas supported by the creeks or the creeks themselves, and therefore water quality is crucial for their survival and propagation.” While the nomination document states that the 5 streams provide critical habitat for threatened, endangered and sensitive species, there is no documentation that critical habitat designations under §4 of the Endangered Species Act include any of the 5 nominated streams. Also, the only federally-listed threatened and endangered species identified in the nomination document associated with the nominated streams are bird species that are weakly dependent on existing water quality in the nominated streams for their maintenance and survival.

ADEQ does not believe that an adequate case for unique waters classification has been made for the 5 streams in the Superstition Wilderness Area. This conclusion is shared by the Tonto National Forest, the primary federal land management agency with jurisdiction over the public lands where the 5 streams are located. Furthermore, as the Tonto National Forest notes in their public comments to ADEQ, unique waters designations are largely unnecessary because of the location of the streams within an established wilderness area which already provides an adequate level of protection for the ecological and recreational values of the nominated streams.

Dry Lake

The Friends of Dry Lake nominated Dry Lake for unique waters classification in July, 1999. Dry Lake is an intermittent wetland in an extinct caldera located west of the city limits of Flagstaff, Arizona. The U.S. Army Corps of Engineers designated approximately 45 acres of Dry Lake as jurisdictional wetland, although the size of the wetland fluctuates considerably with seasonal and precipitation cycles. The wetland lies within the San Francisco Volcanic Field. The only source of water for Dry Lake is drainage from the slopes of the caldera. From the 1940's to the early 1970's, a dairy farm operated within the caldera and a dike was constructed through the bed of Dry Lake. Evidence of this dike and the old dairy farm operations are visible today. At the time of the nomination, Dry Lake and a large part of the caldera were owned by the Flagstaff Ranch Golf Club. At the time the Dry Lake nomination was submitted to ADEQ, a private developer had plans to construct a residential development and golf course within the caldera.

The nomination document states that Dry Lake is an outstanding state resource water because of its rarity. The nomination document states that there are over 600 cinder cones in the San Francisco Volcanic Field and Dry Lake is 1 of the 6 cinder cones that contain a wetlands. The nomination states that a natural wetlands like Dry Lake, a scarce water resource in northern Arizona, is of exceptional ecological significance because of its local importance to wildlife. The nomination cites the presence of three federally-listed or state-listed endangered or threatened bird species, including the bald eagle, peregrine falcon, and the Mexican spotted owl as qualifying Dry Lake for unique water status under R18-11-112(D)(2). Finally, the Friends of Dry Lake state in their nomination that Dry Lake is an outstanding state resource water because of its recreational significance and aesthetic appeal.

ADEQ disagrees that Dry Lake qualifies as one Arizona's outstanding state resource waters when compared to other surface waters statewide. While ADEQ agrees that a wetland within a caldera is relatively rare, ADEQ does not believe that Dry Lake is of exceptional recreational or ecological significance. Dry Lake's recreational significance is limited. At the time of the nomination, most of the caldera was privately-owned and public access to the caldera and Dry Lake was restricted. No water-based recreation is possible at Dry Lake. Recreational activities are limited to nature study, wildlife viewing, and hiking on adjacent public lands.

ADEQ disagrees that Dry Lake is a surface water of exceptional ecological significance for several reasons. First, Dry Lake is an intermittent wetland. Moreover, the Dry Lake bed has been hydrologically modified by the construction of a dike through and dredging activities when the dairy farm operated within the caldera. The caldera and Dry Lake do not exhibit wilderness characteristics because of these hydrologic modifications. The possible presence of the bald eagle, peregrine falcon, and Mexican spotted owl are insufficient to support a unique waters classification for Dry Lake. These bird species are only weakly associated with Dry Lake and the wetland cannot be characterized as *essential* to their maintenance and propagation. Dry Lake has not been designated as critical habitat for any federally-listed threatened or endangered species.

ADEQ also takes note that the Grand Canyon Trust has purchased the caldera basin and Dry Lake from the Flagstaff Ranch Country Club and will preserve the area as open space. This purchase will effectively prevent the development of the golf course and residential housing within the caldera. This purchase effectively removes the threat of development and will preserve the aesthetic and recreational values of Dry Lake and the surrounding caldera. For all of these reasons, ADEQ decided not to propose Dry Lake as a unique water.

Forest Guardians Santa Pedro River Watershed Nominations

Forest Guardians nominated 4 streams in the San Pedro River watershed for unique waters classification. Hot Springs Canyon, Bass Canyon, Redfield Canyon and Wildcat Canyon. These streams are located in Muleshoe Ecosystem located in the Galiuro Mountains in southeastern Arizona. The nomination document states that this ecosystem encompasses the Muleshoe Cooperative Management Area which is jointly managed by Bureau of Land Management, the U.S. Forest Service, and the Nature Conservancy.

Forest Guardians nominated the 4 streams for consideration as outstanding state resource waters because of the existence of perennial flow in each stream and because each one provides important recreational opportunities and wildlife resources. The nomination cites the presence of 29 endangered, threatened, candidate and sensitive species of concern known to be associated with the proposed surface waters, including 5 native fish species.

ADEQ agrees that the nominated surface waters possess outstanding natural attributes that qualify them for unique waters classification. ADEQ has recognized their ecological significance by establishing biocriteria reference sites at 3 of the 4 nominated streams. ADEQ disagrees that the level of recreational use (1,700 - 1,800 visitors a year) supports a finding that the streams are of exceptional recreational significance. None of the nominated streams were rated as outstanding recreation resources by the Arizona River Assessment Project.

While the 4 streams may qualify as outstanding state resources on the ground that they are of exceptional ecological significance, ADEQ has decided not to propose them for unique waters classification. The nominated streams are located in remote areas almost entirely within the boundaries of the Muleshoe Preserve. They are already being well managed to protect existing water quality and the outstanding natural attributes of their riparian corridors. A Muleshoe Ecosystem Management Plan is already in place to improve the nominated watersheds. The Muleshoe Ecosystem Management Plan was created in a joint effort with the cooperation of the Nature Conservancy, Bureau of Land Management, U.S. Forest Service, Arizona Game and Fish Department, neighboring ranchers, and private property owners. These parties, including the Nature Conservancy which is principally responsible for preserving the natural resources and ecological values of the Muleshoe Preserve, oppose unique waters classification for the 4 nominated streams. The nominations also are opposed by the Redington Natural Resource Conservation District. ADEQ has decided that a unique waters classification of the 4 streams is unnecessary and may limit implementation of some of the management tools that have been shown to be effective in watershed improvement under the Muleshoe Ecosystem Management Plan. In the absence of support for these nominations from the principal land management agencies, ADEQ decided not to propose the nominated streams for unique waters classification.

Peeples Canyon Creek

ADEQ received a request from the Arizona Office of the Bureau of Land Management (BLM) to review the existing classification of Peeples Canyon Creek as a unique water. The current unique waters listing of Peeples Canyon Creek is from its headwaters to its confluence with the Santa Maria River. BLM requested that ADEQ revised the current listing because it is inconsistent with the reach of Peeples Canyon Creek that BLM nominated for unique waters classification in 1985. BLM has requested that ADEQ change the unique water listing to be consistent with the original nomination of a 1/4 mile segment of Peeples Canyon Creek associated with South Peeples Spring. This request is strongly opposed by a coalition of 10 environmental organizations who argue that the entire reach of Peeples Canyon Creek, including the headwaters of the creek around Sycamore Spring, deserves protection as a unique water. ADEQ included the BLM request in the preliminary draft rules and the agency solicited public comments on the request to amend the current listing of Peeples Canyon Creek to include only the 1/4 mile segment associated with South Peeples Spring.

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ADEQ decided not to propose any changes to the current listing of Peeples Canyon Creek in the proposed rules for the following reasons:

1. Peeples Canyon Creek, from its headwaters to its confluence with the Santa Maria River, is currently listed as a unique water in R18-11-112. The revision of the listing to include only a 1/4 mile segment of the creek around South Peeples Spring would result in the removal of Tier 3 antidegradation protection for most of the stream that currently is protected as a unique water. ADEQ has never “declassified” a unique water and does not believe that a delisting action is consistent with the intent of the state’s antidegradation rule. Moreover, ADEQ believes that the declassification of a unique water establishes a bad precedent for the unique waters program as a whole which could lead to additional requests to declassify and remove Tier 3 water quality protection from other established unique waters. As a general policy, unique waters should be maintained and protected for future generations. Once a unique water is established by rule, there should be no possibility of “delisting” it and removing its special status.
2. Restricting the unique waters classification to the area around South Peeples Spring would remove Tier 3 antidegradation protection from the Sycamore Spring area in the headwaters of Peeples Canyon Creek located in the Arrastra Mountain Wilderness Area. The practical result of this action would be to facilitate the use of the Sycamore Spring area of Peeples Canyon Creek as a livestock watering area. ADEQ believes that this would lead to significant degradation of existing water quality in the Sycamore Spring area. This result can and should be avoided by retaining the unique waters classification on the entire stream.
3. The Sycamore Spring area of Peeples Canyon Creek is perennial, has exceptional wilderness values, and meets the criteria for unique waters classification. While the Bureau of Land Management may be technically correct that the current listing of Peeples Canyon Creek is inconsistent with the original nomination documents submitted by BLM in 1985, the entire stream from its headwaters to its confluence with the Santa Maria River has been afforded Tier 3 antidegradation protection since 1992. ADEQ sees no compelling reasons to change the unique waters classification now and provide Tier 3 water quality protection in Peeples Canyon Creek on a limited and piecemeal basis.

Effluent dependent waters [R18-11-113]

As noted in the preamble discussion of the definition of “effluent dependent water,” ADEQ proposes to amend the definition of EDW to clarify that an EDW is a surface water that consists of wastewater discharges. Under the proposed definition, an EDW is a surface water that, in the absence of the discharge of treated wastewater, is an ephemeral water. ADEQ proposes to amend the information requirement in R18-11-113(C)(2) to conform it to the proposed amendment to the EDW definition as follows:

- 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 ~~primarily~~ of discharges of treated wastewater.
 3. Information that demonstrates that the receiving surface water is an ephemeral water.

ADEQ is considering 3 requests related to EDWs in this triennial review. First, the City of Willcox has filed a petition for rule adoption requesting that Lake Cochise be classified as an effluent dependent water. The City of Willcox has been treating municipal wastewater and reusing treated effluent on a local golf course. Excess treated effluent is stored in a playa depression that is known locally as Lake Cochise. The only source of water for Lake Cochise is treated wastewater. ADEQ proposes to add Lake Cochise as an effluent dependent water and list it in R18-11-113.

Second, BHP Copper filed a petition for rule adoption requesting that a segment of Queen Creek from the Superior Mining Division discharge point downstream to the Town of Superior wastewater treatment plant be changed from an effluent dependent water to an ephemeral water. BHP Copper has provided information to ADEQ in support of this request to demonstrate that the segment of Queen Creek that is the subject of this request is an ephemeral water. ADEQ proposes to amend R18-11-113(D)(3)(e) as follows:

- D. The following surface waters are classified as effluent dependent waters:
 3. In the Middle Gila River Basin:

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- e. ~~Queen Creek from Superior Mining Division~~
Town of Superior WWTP discharge outfall
to confluence with Potts Canyon

ADEQ also proposes to amend the listing of Queen Creek in Appendix B to indicate that it is an ephemeral water from its headwaters to the Town of Superior WWTP discharge outfall.

Third, ADEQ proposes to adopt a site-specific standard of 36 µg / L for the reach of the Rio de Flag from the Rio de Flag wastewater treatment plant discharge point to the confluence of Wildcat Canyon. The site-specific standard addresses high copper concentrations in the influent to the wastewater treatment plant due to naturally elevated copper concentrations in well water. A water effect ratio (WER) study was performed with effluent from the EDW portion of the Rio de Flag in Flagstaff, Arizona. The WER procedure is an EPA-approved procedure for developing site-specific standards for metals. The scientific basis for the WER procedure is as follows. EPA's ambient water quality criteria for metals are derived from the results of acute and chronic laboratory toxicity tests done in clean laboratory water. Laboratory water contains very low concentrations of substances, such as dissolved organic carbon and suspended solids, or other substances that may sorb or form complexes with metals and reduce their bioavailability or toxicity. Also, EPA's water quality criteria for metals were all based on measurements of total recoverable metal, which EPA acknowledges overestimates the toxicity of metals to aquatic life. The WER procedure was developed to modify criteria for metals to adjust for site-specific effects on metal toxicity in surface waters.

In the WER procedure, two sets of acute or chronic toxicity tests with a metal are done side-by-side. One is done in laboratory water and the other is performed using water taken from the surface water being evaluated. Toxicity endpoints from the two sets of toxicity tests and the ratio between toxicity endpoints are calculated. This is the water effects ratio. To develop a site-specific standard for the surface water, the national or state water quality criterion for the metal is multiplied by the water effects ratio. Two studies for the Rio de Flag were done to develop a site-specific standard for copper. A screening level study was done in June, 1996 and a definitive study done in August, 1996. These WER studies were done by ENSR Toxicology of Fort Collins, Colorado.

The results from the WER studies indicate that copper in the Rio de Flag is at least 6.9 times less toxic than in laboratory water used to derive EPA's ambient water quality criterion for copper. Based on these results, the current chronic water quality standard for copper could be increased 6.9 times without compromising the protection of sensitive aquatic species in the Rio de Flag. Although the results of the WER studies support such an increase, the City of Flagstaff requested that the copper standard be increased only by a factor of 2 to 36 µg/L. The proposed site-specific standard for copper in the Rio de Flag incorporates this additional margin of safety.

ADEQ proposes to adopt the following site-specific standard for dissolved copper in the Rio de Flag:

E. The following site-specific water quality standards apply to the listed effluent dependent waters:

1. Rio de Flag

a. Copper: 36 µg/L (D)

Revision of the mixing zone rule [R18-11-114]

States may, at their discretion, adopt policies in their rules that affect the application and implementation of water quality standards, such as a mixing zone policy. State mixing zone policies are subject to EPA review and approval [See 40 CFR §131.13]. EPA recommends that states have a definitive statement in their water quality standards regulations on whether or not mixing zones are allowed. Arizona has a definitive statement in R18-11-114, the rule that authorizes mixing zones.

A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and where numeric water quality criteria may be exceeded in a receiving surface water. Mixing zones are based on the understanding that it is not always necessary to meet all water quality criteria at the point of discharge to protect the biological, chemical, and physical integrity of a surface water as a whole. Sometimes it is appropriate to allow a pollutant to be discharged in a concentration that exceeds the applicable water quality standard in the immediate area of an outfall. These areas are called mixing zones. Mixing zones may be allowed provided: 1) the mixing zone does not impair the integrity of the surface water as a whole, 2) there is no lethality to organisms passing through a mixing zone, and 3) there are no significant human health risks, considering the likely exposure pathways. Fundamental to the theory of using mixing zones is the belief that by mixing with the receiving water within the zone, the discharge will become sufficiently diluted to meet applicable water quality criteria beyond the borders of the mixing zone.

Mixing zone characteristics are defined on a case-by-case basis after it is determined that there is assimilative capacity in a receiving surface water to safely accommodate the discharge of a pollutant. A mixing zone analysis should take into consideration the physical, chemical, and biological characteristics of the receiving surface water and the discharge, the potential impacts on the aquatic ecosystem, the protection of human health, and the designated uses of the receiving water.

EPA has provided extensive guidance on mixing zones in the *Water Quality Standards Handbook, 2nd Edition* and the *Technical Support Document for Water Quality-Based Toxics Control* (USEPA, 1991, §§ 2.2, 4.3, and 4.4). These EPA guidance documents discuss mixing zone methodologies; the location, size and shape of mixing zones; in-zone water quality, the prevention of lethality to organisms passing through a mixing zone; mixing zone analyses; outfall designs that maximize initial dilution in a mixing zone; critical design periods for mixing zone analyses, and methods to analyze and model near field and far field mixing. ADEQ proposes to amend R18-11-114 to be more consistent with current EPA guidance on mixing zones and to clarify the administrative procedures that apply to establishment of a mixing zone.

R18-11-114 should specifically prescribe water quality requirements within mixing zones. Since a mixing zone is an allocated impact zone where dilution of a discharge is in progress, ADEQ understands that acute and chronic water quality criteria may be exceeded within different boundaries in a mixing zone. ADEQ wants to clarify statements in the current rule at R18-11-114(F) which states that “the Director shall deny the request to establish a mixing zone...if concentrations of pollutants within the proposed mixing zone will cause acute toxicity to aquatic life.” This statement incorrectly suggests that acute toxicity criteria to protect aquatic life always must be met at the “end-of-the-pipe” and that ADEQ cannot establish a mixing zone for an acute toxicity criterion. ADEQ wants to amend the statement in R18-11-114(F) to clarify that ADEQ may establish a zone of initial dilution (ZID) in a mixing zone where it is permissible to exceed an acute toxicity criterion provided certain conditions are met. In a ZID immediately surrounding an outfall, neither acute or chronic toxicity criteria are met. The acute criterion must be met at the boundary of the ZID. In the outer mixing zone, the acute criterion, but not the chronic criterion must be met. The chronic criterion must be met at the boundary of the outer mixing zone. This amendment is consistent with current EPA guidance on mixing zones [See *Water Quality Standards Handbook, Second Edition*, Figure 5-1, p. 5-4, and *Technical Support Document for Water Quality-based Toxics Control*, §2.2.2, p. 33]. Current EPA guidance does not completely prohibit mixing zones for acute toxicity criteria. Rather, EPA guidance prohibits concentrations of pollutants in a mixing zone that are acutely lethal to aquatic organisms passing through a mixing zone. The zone of initial dilution in the mixing zone is sized to prevent lethality to passing organisms.

Lethality is a function of the magnitude of pollutant concentrations and the duration an organism is exposed to those concentrations. An acute toxicity criterion describes the condition under which lethality will not occur if the duration of exposure at the acute toxicity concentration is less than 1 hour. Thus, the areal extent and concentration isopleths of a mixing zone must be such that the 1-hour average exposure of organisms passing through the mixing zone is less than the acute toxicity criterion. An organism must be able to pass through a zone of initial dilution or escape the high concentration area. Lethality to passing organisms can be prevented in a mixing zone in several ways. First, ADEQ can continue the approach articulated in the current rule, prohibit ZIDs, and require that acute toxicity criteria be met at the “end-of-the-pipe.” This conservative approach ensures the prevention of acute toxicity in a receiving water. The second approach is to require that an acute toxicity criterion be met at the boundary of an appropriately-sized ZID that is designed to prevent lethality to passing organisms. In the second approach, an acute toxicity criterion may be exceeded within a ZID. Hydraulic investigations and calculations would have to be provided to ADEQ to demonstrate that the acute toxicity criterion will be met at the boundary of the ZID during critical design flow conditions. *The Water Quality Standards Handbook, Second Edition*, §5.1.2, provides specific guidance on methods that can be used to prevent lethality.

Mixing zones should be denied for persistent, bioaccumulative pollutants of concern (BCCs). The potential for a pollutant to bioaccumulate in living organisms is a function of the bioaccumulation factor (BAF) or bioconcentration factor (BCF) for the pollutant, the duration of exposure, and the concentration of the pollutant. While any BCF greater than 1 indicates that bioaccumulation potential exists, bioaccumulation potential is generally not considered to be of concern unless the BAF or BCF exceeds 1000 or more. The proposed mixing zone prohibition is limited to the following persistent BCCs: chlordane, DDD, DDE, DDT, dieldrin, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, lindane, mercury, PCBs, dioxin, and toxaphene. ADEQ also proposes to prohibit mixing zones for cadmium.

Mixing zones for persistent BCCs should be prohibited to the greatest extent technically and economically possible. This is because BCCs, due to their persistent and bioaccumulative nature, are incompatible with mixing zones. By definition, BCCs are chemicals that do not degrade over time. These chemicals accumulate in organisms living in surface waters and they become more concentrated as they move up the food chain - from biota to fish and wildlife to humans. Because the effects of these chemicals are not mitigated by dilution, using a mixing zone to dilute the discharge of a BCC is inappropriate. Dilution and dispersion are not appropriate control strategies for BCCs and a mixing zone is an inadequate substitute to the removal and treatment of a BCC at the source before it is discharged to a surface water.

Finally, ADEQ proposes to make procedural changes to R18-11-114 on how mixing zones are established. R18-11-114(A) states that the Director may establish a mixing zone by order. ADEQ proposes to amend R18-11-114(A) to clarify that a mixing zone is established as part of the NPDES permit issuance process and not by administrative order.

Nutrient Waivers [R18-11-115]

R18-11-115 authorizes a waiver from water quality standards for total phosphorus and total nitrogen that apply to ephemeral waters by operation of the tributary rule. Nutrient waivers are available on a discharger-specific basis. Typically, they are issued to the operators of wastewater treatment plants that discharge to ephemeral tributaries to surface waters to which numeric nutrient standards apply. Under R18-11-115, a discharger must apply for a nutrient waiver. A discharger may obtain a nutrient waiver by demonstrating that the discharge of wastewater to an ephemeral tributary will not cause a violation of the nutrient standards that apply to the downstream surface water.

Currently, both the nutrient waiver rule at R18-11-115 and the variance rule at R18-11-122 provide mechanisms for a point source discharger to discharge wastewater containing concentrations of nitrogen or phosphorus that exceed surface water quality standards. In effect, a nutrient waiver is a type of variance from water quality standards. While different information requirements and conditions apply to nutrient waivers and variances, they are similar in many respects. Nutrient waivers and variances have the following similarities:

- Both authorize a temporary exceedance of a water quality standard.
- Both are discharger-specific.
- Both are pollutant-specific (e.g., total nitrogen and total phosphorus)
- Both have 5-year terms.
- Both are re-evaluated upon the issuance, reissuance, or modification of the NPDES permit for the discharge.
- The same public participation processes apply to variances and nutrient waivers.
- The same administrative appeal processes apply to both.
- Variances and nutrient waivers are both subject to EPA review and approval.

There are 3 major differences between a variance and a nutrient waiver. First, the grounds for obtaining a variance are different from the grounds for obtaining a nutrient waiver. To obtain a variance, a discharger must demonstrate that treatment more advanced than applicable technology-based requirements of the Clean Water Act are necessary to comply with a water quality standard and either: 1) it is not technically feasible to achieve compliance within 5 years, or 2) the cost of treatment to achieve compliance would result in "substantial and widespread economic and social impact." For example, a wastewater treatment plant operator who wants to obtain a variance from a nutrient standard would have to demonstrate: 1) that treatment beyond secondary treatment requirements is necessary to achieve compliance with the nutrient standard, and 2) that it is either not technically feasible to install nutrient control treatment technology at the wastewater treatment plant within 5 years or the cost of installing the treatment technology would have a substantial and widespread economic and social impact in the community. These technology requirements do not apply to nutrient waivers. To obtain a nutrient waiver, the operator of the wastewater treatment plant must demonstrate that the receiving water is an ephemeral water and that the discharge of wastewater to the ephemeral water will not cause a violation of applicable nutrient standards in the nearest downstream surface water. There are no requirements to demonstrate that it is technically or economically infeasible to install nutrient control technology at the wastewater treatment plant to obtain a nutrient waiver.

Second, to renew a variance a discharger must demonstrate that a discharging facility is making “reasonable progress” towards achieving compliance with the applicable standard over the term of the variance [See R18-11-122(D)]. In effect, R18-11-122(D) is a technology-forcing provision that requires a periodic review to see if it is feasible to achieve compliance with water quality standards. In the example provided in the previous paragraph, R18-11-122(D) would require that the wastewater treatment plant operator control the discharge of nutrients to the maximum extent practicable with existing treatment technology. Eventually, the rule would require a wastewater treatment plant operator to install a treatment upgrade to control the excessive concentration of nutrients in a discharge. The “reasonable progress” requirement is not found in the current nutrient waiver provision. There is nothing in the current nutrient waiver rule that requires a discharger to take any steps at all to control the discharge of nutrients once a nutrient waiver is obtained. Wastewater treatment plant operators who have obtained nutrient waivers for their facilities typically reapply and renew them every 5 years. There is nothing in the rule that requires a review to determine whether it is feasible to install nutrient control technologies. Consequently, the rule permits wastewater treatment plants to continue operation over consecutive 5-year nutrient waiver cycles without ever having to address the excessive discharge of nutrients to the receiving water.

Finally, the current variance provision requires the proposal of interim discharge limitations that represent the highest level of treatment that is achievable by a point source discharge during the term of the variance. A nutrient waiver does not require the proposal of interim discharge limitations to control the discharge of nutrients. Instead, the nutrient waiver provision waives the applicable surface water quality standards for total nitrogen or total phosphorus. In doing so, a nutrient waiver removes the legal basis for the establishment of any water quality-based discharge limitations in an NPDES permit to control the discharge of nutrients to the receiving water. There are no regulatory requirements to improve the performance of the wastewater treatment plant.

ADEQ proposes to repeal the nutrient waiver provision at R18-11-115 for two reasons. First, the variance provision serves the same function as the nutrient waiver provision. A variance can be obtained from water quality standards for total phosphorus or total nitrogen. Second, ADEQ believes that the surface water quality standards rules should require a discharger to take steps to upgrade treatment to control the discharge of nutrients if it is technically and economically feasible to do so. At a minimum, the rule should require the implementation of measures to control the discharge of nutrients to the maximum extent practicable (i.e., through imposition of interim discharge limitations). Unlike the variance rule, the nutrient waiver rule has no requirements to take corrective action to control the discharge of nutrients even if treatment upgrades are technically and economically feasible. The nutrient waiver rule authorizes the continued discharge of wastewater that exceeds applicable nutrient standards without any consideration of available treatment alternatives to control nutrients in that discharge.

The proposed repeal of the nutrient waiver provision is opposed by some members of the regulated community who are concerned that the current variance provision is so restricted that it is effectively unavailable to dischargers. The regulated community has argued that the nutrient waiver provision should be retained because it is limited in its scope. They argue that the nutrient waiver rule is limited in scope because: 1) it applies only to two pollutants, nitrogen and phosphorus, neither of which are toxic pollutants, and 2) it applies only to discharges to ephemeral waters that are tributary to surface waters for which nutrient standards have been established. Finally, it is argued that the nutrient waiver provision should be retained because it provides a significant benefit to small wastewater treatment plants that may not have the financial capability to upgrade treatment processes without resulting in documented nutrient problems in downstream surface waters. ADEQ disagrees that a variance will be effectively unavailable to dischargers. A variance for nutrients could be obtained on grounds that it is economically infeasible to install nutrient control technologies at the wastewater treatment plant. Second, ADEQ disagrees that wastewater treatment plants should not be required to control nutrients in discharges to ephemeral tributaries of surface waters for which nutrient standards have been established. The discharge of treated wastewater to an ephemeral water creates an effluent dependent water. The effective control of nutrients in the treated wastewater that creates the EDW will improve water quality in the EDW and help to prevent accelerated eutrophication and the nuisance growth of algae. Finally, less than 10 wastewater treatment plants in the state currently operate under nutrient waivers. Small wastewater treatment plants that are financially incapable of upgrading treatment processes to control the discharge of nutrients should be able to obtain a variance.

Dams and flood control structures [R18-11-118]

ADEQ proposes to repeal R18-11-118(B). R18-11-118(B) states that nothing in the surface water quality standards rules shall be construed to require a person who operates a dam or flood control structure to operate the structure to cure or mitigate an exceedance of a water quality standard caused by another person. This provision is confusing. The original intent of R18-11-118(B) is not clear, especially since R18-11-118(C) already states that nothing in the surface water quality standards rules shall require the release of water from a dam. It is not clear how a person could operate a dam or flood control structure to cure or mitigate an exceedance of a water quality standard caused by another person except by releasing of water. R18-11-118(B) is unnecessary.

Enforcement [R18-11-120]

ADEQ proposes to amend R18-11-120(C). R18-11-120 (C) states that ADEQ shall determine compliance with chronic aquatic and wildlife (A&W) criteria from the arithmetic mean of the analytical results of samples collected over a period of 4 consecutive days at a minimum rate of 1 grab sample per day. The current rule effectively makes the state's chronic A&W criteria unenforceable.

ADEQ staff in the Surface Water Quality Monitoring and Standards Unit are responsible for conducting ongoing monitoring of the surface waters in the state. Each water year, ADEQ staff conduct water quality monitoring at Fixed Station Network sites statewide to determine long-term water quality trends and compliance with surface water quality standards. Also, ADEQ staff also have implemented a targeted watershed approach to surface water quality monitoring and assessment. Arizona is divided into 10 watersheds for monitoring purposes. ADEQ staff conduct monitoring at sites located in 2 watersheds each year. A 5-year rotating schedule has been established so all 10 watersheds will be monitored over a 5-year period. ADEQ staff conduct monitoring at each sampling site 4 times a year. Because of budget, time, and other resource constraints, ADEQ staff cannot stay at a single sampling site for 4 consecutive days to take water quality samples at the rate of 1 grab sample per day. Consequently, ADEQ does not meet the minimum data requirements to determine compliance with chronic A&W water quality standards.

ADEQ proposes to amend R18-11-120(C) to make it possible to assess compliance with chronic A&W water quality standards. ADEQ proposes to amend the rule as follows:

- C. The Department shall determine compliance with acute aquatic and wildlife criteria from the analytical result of a grab sample. Compliance with chronic aquatic and wildlife criteria shall be determined from the arithmetic geometric mean of the analytical results of ~~grab samples collected over a period of 4 consecutive days at a minimum rate of 1 grab sample per day~~ the last 4 samples taken at least 24 hours apart.

Schedules of compliance [R18-11-121]

ADEQ proposes to amend the schedule of compliance provision at R18-11-121 to allow compliance schedules for new and recommencing sources, similar to EPA's schedule of compliance provision for NPDES permits at 40 CFR §122.47.

R18-11-121(B) states that a schedule of compliance shall not be established in a NPDES permit for a new point source. The rule defines a new point source as follows:

[A] new point source means a point source, the construction of which commences after the effective date of a water quality standard. 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. On-site physical construction program 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% of the total cost incurred for physical construction.

The federal NPDES permit rules include a schedule of compliance provision for new sources at 40 CFR §122.47(a)(2). The federal NPDES permit regulations do not prohibit schedules of compliance for new sources or new dischargers. The federal rule permits a schedule of compliance for a new source, but only when necessary to allow a reasonable opportunity to attain compliance with requirements that are issued or revised after commencement of construction but less than three years before commencement of the relevant discharge. The federal rule also permits schedules of compliance for recommencing dischargers to allow a reasonable opportunity to attain compliance with requirements issued or revised less than 3 years before recommencement of a discharge. ADEQ proposes to amend R18-11-121(B) to make it consistent with the federal regulation that addresses schedules of compliance for new and recommencing dischargers.

Variances [R18-11-122]

In the last triennial review, ADEQ adopted R18-11-122 which establishes a procedure for granting a variance from a water quality standard. The adoption of R18-11-122 is consistent with EPA guidance which states that variances from state-adopted water quality standards are allowed [*See Water Quality Standards Handbook, 2nd Edition*, §5.3 (August, 1994)].

According to EPA guidance, a variance from water quality standards involves the same substantive and procedural requirements that apply to the removal of a designated use through the use attainability process, except that variances are discharger-specific, pollutant-specific, limited in duration, and do not result in a change to a designated use. A variance is viewed as an alternative to a permanent downgrade of a water quality standard. A variance is typically used where a state believes that a water quality standard can ultimately be attained. By maintaining the water quality standard and granting a variance, the state can assure that reasonable progress is made in improving water quality. With a variance, a NPDES permit may be written to ensure that reasonable progress is made toward attaining the water quality standard without violating §402(a)(1) of the Clean Water Act which requires that NPDES permits ensure compliance with water quality standards.

R18-11-122 authorizes a variance where a point source discharger demonstrates that it is not technologically feasible to immediately comply with an applicable water quality standard or where compliance with a water quality standard will cause substantial and widespread economic and social impact. The variance procedure allows temporary non-compliance with a water quality standard while maintaining that standard as a water quality goal for a surface water.

In the 1992 triennial review, Arizona adopted a comprehensive set of numeric water quality standards for toxic pollutants. The numeric water quality criteria were derived using methodologies that did not take the economic or technical feasibility of achieving compliance into consideration. The water quality criteria were established at concentrations deemed necessary to protect the various designated uses. In the last triennial review, ADEQ acknowledged that a variance procedure should be included in the water quality standards rules to provide regulatory flexibility when it is not technically or economically feasible for a point source discharger to achieve compliance with a water quality standard. Situations can and do arise where a point source discharger cannot comply with a water quality standard because the treatment technology is unavailable or the cost of treatment is too high. In such cases, a variance procedure provides a mechanism for maintaining the water quality standard as the ultimate water quality goal for a surface water while providing short-term relief from the water quality standard for a specific discharge. The grant of a variance does not modify a water quality standard, but does provide the legal basis for the establishment of alternative discharge limitations in an NPDES permit. The allowance of a variance on a discharger-specific, pollutant-specific, short-term basis is preferable to a permanent downgrade of the water quality standards for a surface water through the use attainability process.

Under R18-11-122, a variance may be granted on a discharger-specific basis for a period of up to five years. A variance is implemented through an NPDES permit for a specific point source discharge. A point source discharger must document that treatment more advanced than that required by technology-based effluent limitations prescribed by the Clean Water Act is necessary to achieve compliance with the water quality standard and that alternative discharge control strategies to achieve compliance with the water quality standard have been evaluated. The point source discharger must document 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 or that the installation and operation of the treatment technology would cause substantial and widespread social and economic impact. An applicant for a variance also must demonstrate that the discharge of the pollutant for which a variance is sought is reduced to the maximum extent practicable through implementation of a local pretreatment program, source reduction, or waste minimization. Finally, an applicant for a variance must propose interim discharge limitations which represent the highest level of treatment achievable by the point source discharge during the term of the variance.

A variance may be renewed, but a point source discharger who seeks renewal must demonstrate that reasonable progress towards achieving compliance with the water quality has been made during the term of the variance. R18-11-122 includes public participation procedures and provides a right of appeal to any person who may be adversely affected by a decision to grant or deny a variance from a water quality standard. The rule also clarifies that all variances are subject to EPA review and approval.

ADEQ has received a request that ADEQ reconsider a number of issues related to variances that were raised in the last triennial review. These variance issues include: 1) the suggestion to modify the variance procedure to permit temporary suspensions of a water quality standard while one or more dischargers work under ADEQ supervision to correct a water quality problem, 2) a request to amend the variance procedure to include all 6 factors identified by EPA in 40 CFR §131.10(g), 3) a request to extend the variance provision to cover nonpoint source discharges, and 4) a request to allow variances for specific surface waters or segments of surface waters. ADEQ specifically responded to several of these issues in the last triennial review and the comment responses reflect ADEQ current thinking on these issues.

ADEQ disagrees that R18-11-122 should be amended to authorize variances for nonpoint source discharges. While EPA has approved variance procedures for nonpoint source discharges in a few states like Colorado, such states are in the minority. In the National Assessment of State Variance Procedures published in November, 1990, EPA reported that 32 of the 57 states and territories have authority to grant variances from water quality standards. Of these states, 22 allowed variances from water quality standards for individual dischargers and only 7 states specifically authorized variances for nonpoint source runoff. A significant concern with authorizing variances from water quality standards for nonpoint sources is that the grant of a variance may undermine the implementation of best management practices [BMPs] through nonpoint source management control programs. A nonpoint source discharger may seek a variance rather than identifying and implementing BMPs which could be used to achieve compliance with water quality standards.

ADEQ also is concerned about how to administer and implement a variance for a nonpoint source discharge. As proposed, a variance from a water quality standard may be issued only on a discharger-specific basis. Under the proposed rule, the granting of the variance does not modify a water quality standard in a surface water. Other point source discharges to the surface water are required to comply with applicable water quality standards, including the water quality standard for which a variance has been granted to a specific discharger. A variance for a nonpoint source discharge would be fundamentally different. It would not be possible to grant a variance for a nonpoint source discharge on a discharger-specific basis. The only way to grant a variance for a nonpoint source discharge would be to temporarily modify the water quality standard for the surface water. A temporary modification of a water quality standard would affect all point source and nonpoint source discharges to the surface water. Moreover, under Arizona law, rulemaking would be required to modify a water quality standard in this way.

As proposed by ADEQ, a variance is clearly tied to the NPDES permitting program. Variances are for terms of up to five years and they are reevaluated when the NPDES permit for a point source discharge is reissued. There is no similar regulatory program through which a variance for a nonpoint source discharge could be administered.

Finally, the intent of the proposed variance provision is to ensure the highest level of water quality achievable while a variance is in effect. The proposed rule achieves this by requiring a demonstration by a point source discharger that the discharger has reduced, to the maximum extent practicable, the discharge of the pollutant for which a variance is sought. The discharger also is required to propose interim discharge limitations which represent the highest level of treatment achievable during the term of the variance. It is not clear how to ensure the highest level of water quality achievable when a variance is requested for a nonpoint source discharge.

ADEQ also disagrees that the variances should be permitted for all of the grounds that support a use attainability analysis. While EPA guidance on variances indicates that a variance from a water quality standard may be based upon any of the grounds for removing a designated use prescribed in 40 CFR §131.10(g), ADEQ does not believe that most of the grounds cited in 40 CFR §131.10(g) are appropriate for a discharger-specific variance. The five grounds are:

1. Naturally occurring pollutant concentrations prevent the attainment of the water quality standard;
2. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the water quality standard, unless these conditions may be compensated by the discharge of a sufficient volume of effluent to enable the water quality standard to be met without violating state water conservation requirements;
3. Human-caused conditions or sources of pollution prevent the attainment of the water quality standard and cannot be remedied, or would cause more environmental damage to correct than leave in place;

4. Dams, diversions or other types of hydrologic modifications preclude the attainment of the water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the water quality standard; and
5. Physical conditions related to the natural features of the waterbody such as the lack of a proper substrate, cover, flow, depth, pools, riffles and the like, unrelated to chemical water quality, preclude the attainment of the water quality standard.

While the five grounds may support the removal or downgrade of a designated use of a surface water, 4 of the 5 grounds do not support a variance for a specific point source discharger. For example, it is not clear how “naturally occurring pollutant concentrations which prevent attainment of the water quality standard” may be applied to support a variance for an individual point source discharger. While there may be situations where it is not possible to comply with a water quality standard because of naturally occurring pollutant concentrations in a surface water, it is difficult to see why a point source discharger should be granted a variance from a water quality standard on this ground. If it is impossible to attain compliance with a water quality standard because of naturally occurring pollutant concentrations, then the appropriate response is to conduct a use attainability analysis to modify the water quality standard for the surface water. A variance is premised on the belief that the conditions which prevent attainment of a water quality standard are temporary in nature and that compliance with the water quality standard ultimately can be achieved. When a naturally occurring concentration of a pollutant prevents attainment of a water quality standard, it is unlikely that compliance with the water quality standard will ever be achieved. Naturally-occurring pollutant concentrations in a surface water are permanent in nature. Similarly, when natural, ephemeral, intermittent or low flow conditions prevent attainment, or dams, diversion, or other types of hydrologic modifications prevent attainment; or physical conditions related to the natural features of a surface water prevent attainment of a water quality standard, then the appropriate regulatory response is a UAA, not a variance. When such conditions exist, they are permanent in nature and it is unlikely that such conditions will change in the future.

When ADEQ adopted the variance provision in 1996, ADEQ stated its position that only one element in 40 CFR §131.10(g) may be applied on a discharger-specific basis because it was related to a discharger's capability to install and operate discharge control technology to attain designated uses. 40 CFR §131.10(g)(6) allows the removal of a designated use if it can be demonstrated that attaining the designated use is not feasible because “controls more stringent than those required by §301(b) and §306 of the Act would result in substantial and widespread economic and social impact.”

When EPA first indicated the allowability of state water quality variance provisions in the federal Water Quality Standards Regulations at 40 CFR §131.13, EPA stated in the preamble that state-adopted variances could be approved if they were based upon a demonstration that meeting a water quality standard would cause “substantial and widespread economic and social impact” [See 48 Federal Register 51403]. This conclusion was based upon Decision of the General Counsel No. 58 [44 FR 39508 (March 29, 1977)]. In that decision, EPA stated:

[V]ariances can be granted by States only when achieving the standard is unattainable. In demonstrating that meeting the standard is unattainable, the State must demonstrate that treatment in excess of that required by §301(b)(2)(A) and (B) of the CWA is necessary to meet the standard and also must demonstrate that requiring such treatment will result in substantial and widespread economic and social impact....

Subsequent EPA guidance has elaborated federal variance policy. On March 15, 1985, EPA issued a memorandum reinterpreting the factors that could be considered when granting variances. The memorandum explained that variances could be based on any of the grounds outlined in 40 CFR §131.10(g) for removing a designated use. This interpretation was based on EPA's reading of §510 of the Clean Water Act which states have the right to establish more stringent standards than those suggested by EPA. EPA concluded that as long as any temporary water quality standards variance conformed to the requirements established in 40 CR §131.10(g) for removal of a designated use, it would be more stringent than the federal requirements since it would be a temporary rather than a permanent downgrade in use.

EPA has stated in guidance that although the March 15, 1985 memorandum broadened the factors that could be considered for granting a variance, *it continued to interpret variances as being limited to individual dischargers*. EPA has acknowledged that while the legal rationale for broadening the factors may seem reasonable, the practical impact of limiting variances to individual dischargers is that the only factor that can be actually used is the “substantial and widespread economic and social impact” factor.

The variance provision at R18-11-122 is intended to apply on a discharger-specific basis. ADEQ recognizes that situations can and do arise where technological limitations or substantial economic hardship for a specific discharger make short-term compliance with standards impossible. In such cases, a variance from the water quality standard may be justified. In ADEQ's view in 1996, the only ground that could be practically applied to support a request for a variance in such situations was the "widespread and substantial economic and social impact" factor.

In comments on preliminary draft surface water quality standards rules, the Arizona Mining Association has renewed a request to expand the grounds for variances and to allow variances for specific surface waters or segments of surface waters. ADEQ continues to disagree that variances should be allowed for specific surface waters. Variances should be allowed on a discharger-specific basis only. This is consistent with current EPA policy that variances are discharger and pollutant-specific and limited in duration. A "waterbody variance" is essentially a modification of a water quality standard that can only be done in Arizona through the rulemaking process.

The suggestion by the Arizona Mining Association to allow for "waterbody variance" is consistent with an approach to variances that EPA is solicited comment on in the Advanced Notice of Proposed Rulemaking (ANPR) on the water quality standards regulation. EPA stated in the ANPR that it was considering the approach of dividing variances into two categories: waterbody variances [to which the first five designated use removal elements in 40 CFR §131.10(g) would apply] and discharger-specific variances [to which the "substantial and widespread economic and social impact" factor would apply]. While ADEQ recognition of a "waterbody variance" would be consistent with EPA's approach, ADEQ does not believe that the grounds which support a "waterbody variance" are distinguishable from the factors that support the downgrade or removal of a designated use through the use attainability process. For example, if naturally occurring pollutant concentrations in a surface water prevent the attainment of a designated use, then the appropriate regulatory response is the removal of the designated use, not the issuance of a variance that is limited in duration. In general, variances should be used only where the state believes that a water quality standard can ultimately be attained. ADEQ believes that four of the five grounds in 40 CFR §131.10(g) [other than "widespread and substantial economic and social impact" and "human-caused sources of pollution"] that are cited by EPA as supporting a "waterbody variance" are essentially permanent in character. It is unlikely that where such conditions exist in a surface water, that the conditions will change so that the water quality standard ultimately may be attained. Where a water quality standard cannot be attained because of naturally occurring pollutant concentrations; low flow conditions; the existence of dams, diversions or other hydrological modifications; or physical conditions related to the natural features of a surface water, it is unlikely that the water quality will ever be attained, even in the long term. Where such conditions exist, a UAA should be conducted to remove or permanently downgrade the designated use. Finally, it should be noted that while EPA stated that it was considering waterbody variances in the ANPR, EPA has not proposed this type of variance in any revisions to the federal water quality regulations.

ADEQ has reconsidered one of the grounds for a UAA that ADEQ believes may be used to support a variance. One of the grounds for a UAA is "...human-caused conditions or sources of pollution prevent the attainment of the water quality standard and cannot be remedied, or would cause more environmental damage to correct than leave in place." ADEQ acknowledges that there may be situations where human-caused conditions or sources of pollution prevent the attainment of a water quality standard and cannot be remedied in the short-term (i.e. within 5 years), but the water quality standard may be ultimately attainable. For example, a TMDL strategy may be implemented that is designed to achieve compliance with a water quality standard. However, the time line for achieving compliance with the water quality standard may be more than 5 years out. Under such circumstances, it may be appropriate to grant a variance to a point source discharger.

Prohibitions against discharge [R18-11-123]

§312(f)(1)(B)(3) of the Clean Water Act addresses the regulation of marine sanitation devices. It states, in relevant part:

[I]f any State determines that the protection and enhancement of the quality of some or all of the waters within such State require greater environmental protection, such State may completely prohibit the discharge from all vessels of any sewage, whether treated or not, into such waters, except that no such prohibition shall apply until the Administrator determines that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available for such water to which such prohibition would apply.

The States of Utah and Arizona are applying to EPA to prohibit the discharge of sewage to Lake Powell. Arizona has determined that the protection and enhancement of Lake Powell water quality requires greater environmental protection by prohibiting discharges of sewage from vessels. Moreover, Arizona believes that adequate facilities for the safe and sanitary removal and treatment of sewage from all vessels are reasonably available at Lake Powell. Consequently, ADEQ proposes to include such a prohibition against the discharge of sewage from vessels to Lake Powell in R18-11-123.

Appendix A. Numeric Water Quality Criteria

A water quality standard is defined as a provision of state law that consists of designated uses *and water quality criteria based upon such uses* [See §303(c)(2)(A) of the Clean Water Act]. Water quality criteria are specifically defined as “elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When the criteria are met, water quality will generally protect the designated use” [See 40 CFR §131.3].

40 CFR §131.11(a)(1) requires that states adopt water quality criteria to maintain and protect water quality for designated uses. State-adopted water quality criteria must be based on a sound scientific rationale and they must contain sufficient parameters or constituents to protect the designated uses. In establishing numeric water quality criteria for designated uses, states may establish numeric values based upon the following: 1) EPA recommendations contained in national criteria guidance documents published under §304(a) of the Clean Water Act, 2) §304(a) guidance modified to reflect site-specific conditions, or 3) other scientifically defensible methods. §304(a) of the Clean Water Act requires EPA to develop and publish, and from time to time revise, criteria for water quality accurately reflecting the latest scientific knowledge. Water quality criteria developed under §304(a) are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. EPA’s §304(a) criteria do not reflect consideration of economic impacts or technological feasibility of meeting the chemical concentrations in ambient water. EPA’s §304(a) criteria recommendations provide guidance to the states in adopting numeric water quality standards. While EPA’s national criteria recommendations are not regulations and they do not impose legally binding requirements on states, once EPA publishes new or revised §304(a) criteria guidance, EPA expects the state to adopt new or revised criteria into their water quality standards. On December 10, 1998, EPA published a compilation of recommended water quality criteria in the Federal Register [See 63 Federal Register 68354 (December 10, 1998)]. ADEQ reviewed the EPA’s national criteria recommendations to determine whether current state-adopted criteria are consistent.

Arizona law also provides guidelines for the state adoption of numeric water quality criteria for designated uses. A.R.S. § 49-22(C)(5) states that ADEQ shall consider the guidelines, action levels or numerical criteria adopted or recommended by EPA or any other federal agency when setting water quality standards. As noted earlier, there is a preference in Arizona law for numeric water quality criteria if adequate information exists to support the establishment of numeric standards [See § 49-221(D)]. Finally, § 49-222(C) sets forth legislative guidelines for setting numeric standards for surface waters:

In setting numeric standards for the quality of navigable waters, the director 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 such pollutants, and the extent to which the natural flow of the stream is intermittent or ephemeral, as a result of which the instream flow consists mostly of treated wastewater effluent, except that such standards shall not, in any event, be inconsistent with the Clean Water Act.

ADEQ proposes to amend the water quality criteria for many pollutants and designated uses in this triennial review. For some designated uses, ADEQ proposes to revise the methodology that was used to derive the numeric criteria. For example, ADEQ proposes to revise the methodology that is used to derive water quality criteria for the partial body contact recreation designated use. For other designated uses, ADEQ proposes to use the same methodologies but update the criteria using health effects and toxicity data that has become available since the last triennial review of water quality standards.

Revising the numeric water quality criteria in Appendix A for the protection of human health

Appendix A contains numeric water quality criteria for 4 designated uses that are established at concentrations which are intended to protect human health. The 4 designated uses are: domestic water supply (DWS), fish consumption (FC), full body contact recreation (FBC), and partial body contact recreation (PBC). Water quality criteria for these designated uses are established at concentrations that are intended to protect against long-term, or chronic, human health effects.

ADEQ uses EPA-recommended methodologies to derive water quality criteria for the DWS, FBC, and FC designated uses. Separate criteria derivation methodologies were used to calculate criteria for pollutants depending on whether a pollutant is a carcinogen or non-carcinogen. The carcinogen procedure was used to derive criteria for pollutants that EPA identifies as known, probable, or possible human carcinogens. The carcinogen procedure employs the use of cancer potency slopes ($q1^*$) in the calculation to derive a criterion. The non-carcinogen procedure uses reference doses (RFDs) to calculate a criterion.

Revising criteria for the domestic water source designated use

ADEQ derived criteria to maintain and protect water quality for use as a raw water source for drinking water (i.e., the domestic water source or DWS) in two ways. First, ADEQ uses maximum contaminant levels (MCLs) that have been promulgated for drinking water under the Safe Drinking Water Act as numeric criteria for the DWS designated use where MCLs were available. ADEQ revised the DWS criteria to include the following MCLs:

Dalapon	200 ug / L
Di (2-ethylhexyl) adipate	400 ug / L
Dinoseb	7 ug / L
Diquat	20 ug / L
Endothall	100 ug / L
Endrin	2 ug / L
Glyphosate	700 ug / L
Oxamyl	200 ug / L
Picloram	500 ug / L
Simazine	4 ug / L

Second, ADEQ proposes to establish a criterion of 100 $\mu\text{g} / \text{L}$ for individual trihalomethanes, including bromodichloromethane, bromoform, chloroform, and dibromochloromethane. This criterion is the same as the MCL for total trihalomethanes. The MCL for total trihalomethanes represents the maximum allowable limit for any individual trihalomethane. ADEQ revised the numeric criteria for the individual trihalomethanes by adding 100 $\mu\text{g} / \text{L}$ after "TTHM" in Appendix A, Table 1.

Third, ADEQ derived numeric criteria for the DWS designated use using the following methodologies when MCLs were not available:

For carcinogens:
$$\frac{70 \times 10^{-6}}{q1^* \times 2}$$

In this equation, 70 represents the average weight of a human male in kilograms (kg); 10^{-6} (1 in 1,000,000) is the excess cancer risk level, $q1^*$ is the cancer potency slope, and 2 is the national average water consumption rate in liters / day.

For non-carcinogens:
$$\frac{\text{Rfd} \times 70 \times 0.2}{2}$$

In this equation, Rfd is the oral reference dose in milligrams / kilogram / day; 70 is the average weight of a human male in kilograms (kg); 0.2 is the allowable water source contribution factor; and 2 is the national average water consumption rate in liters / day. The use of an allowable water source contribution factor is a way of recognizing that a person's exposure to a pollutant may come from other sources, such as dietary intake, and from other exposure pathways such as inhalation and dermal contact. There is little information available to assess the amount of exposure to a chemical that may be attributed to various exposure pathways. EPA uses an allowable water source contribution factor of 0.2 in the Safe Drinking Water Act program to calculate MCLs. This means that EPA estimates that 20% of a person's exposure to a pollutant is estimated to be through ingestion of drinking water. EPA considers this value to be reasonably conservative and protective when developing standards for drinking water. ADEQ used the same allowable water source contribution value of 20% to derive criteria for non-carcinogens for the DWS designated use when there are no MCLs.

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ADEQ proposes to update the DWS criteria for parameters using current q1*s and Rfds from the Integrated Risk Information System database. ADEQ has new human health effects data to derive DWS criteria for the following pollutants that currently do not have numeric criteria:

Chlorine (total residual)	NNS to 700 µg / L
Chromium III	NNS to 10,500 µg / L
Chromium VI	NNS to 21 µg / L
2,6 - Dinitrotoluene	NNS to 0.051 µg / L
Di-n-octyl phthalate	NNS to 2800 µg / L
Napthalene	NNS to 140 µg / L
Silver	NNS to 35 µg / L

ADEQ updated the DWS criteria for the following parameters using new or revised q1*s, Rfds, or Minimum Risk Levels (MRLs). In some cases, criteria were changed to NNS because Rfds or q1*s have been withdrawn and are now unavailable. Finally, some criteria were found to be incorrect because of decimal misplacement or were revised because a different rounding convention was used.

Acrolein	110 µg / L to 3.50 µg / L
Acrylonitrile	0.06 µg / L to 0.065 µg / L
Benz (a) anthracene	0.003 µg / L to NNS
Benzo (k) fluoranthene	0.003 µg / L to NNS
3, 4 - Benzofluoranthene	0.003 µg / L to NNS
Bis (2-chloroethyl) ether	0.03 µg / L to 0.032 µg / L
Chrysene	0.003 µg / L to NNS
Copper	1000 µg / L to 1300 µg / L
Dibenz (ah) anthracene	0.003 µg / L to NNS
1,3-Dichlorobenzene	94 µg / L to NNS
3, 3'-Dichlorobenzidine	0.08 µg / L to 0.078 µg / L
p,p'Dichlorodiphenyldichloroethane (DDD)	0.15 µg / L to 0.146 µg / L
p,p'Dichlorodiphenyldichloroethylene (DDE)	0.1 µg / L to 0.103 µg / L
p,p'Dichlorodiphenyltrichloroethane (DDT)	0.1 µg / L to 0.103
1, 3-Dichloropropene	0.2 µg / L to 2.1 µg / L
Dimethyl phthalate	70,000 µg / L to NNS
4, 6 -Dinitro-o-cresol	2.7 µg / L to 28 µg / L
Endosulfan sulfate	0.35 µg / L to NNS
Endrin aldehyde	2.1 µg / L to NNS
Indeno (1,2,3 - cd) pyrene	0.003 µg / L to NNS
Lead	50 µg / L to 15 µg / L
Manganese	4900 µg / L to 980 µg / L
Nickel	100 µg / L to 140 µg / L
N-nitrosodimethylamine	0.0007 µg / L to 0.001 µg / L
N-nitrosodiphenylamine	7.1 µg / L to 7.14 µg / L
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.0000003 µg / L to 0.00003 µg / L

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1,1,2,2-Tetrachloroethane	0.17 µg / L to 0.175 µg / L
2,4,6-Trichlorophenol	3.2 µg / L to 3.18 µg / L

Update fish consumption criteria in Appendix A.

In the last triennial review, ADEQ derived water quality criteria for the fish consumption designated use using the following equation for carcinogens:

$$q_1^* \times \frac{70 \times 10^{-6}}{0.0065 \times \text{BCF}}$$

ADEQ derived water quality criteria for the FC designated use for non-carcinogens using the following equation:

$$\frac{\text{RfD} \times 70}{0.0065 \times \text{BCF}}$$

In these equations, 70 is the average weight of the human male in kilograms, 10^{-6} is the excess cancer risk level, 0.0065 is the national average fish consumption rate in kilograms per day, BCF is the bioconcentration factor in L / kg, q_1^* is the cancer potency slope in mg / kg / day, and Rfd is the reference dose in mg / kg / day.

The fish consumption value of 6.5 grams per day used in the above equations is based upon the national average fish consumption value that EPA used to calculate its §304(a) national criteria recommendations in 1980. Since the state's adoption of fish consumption criteria based on a 6.5 grams / day fish consumption rate, EPA has issued new guidance on how to derive fish consumption criteria entitled Ambient Water Quality Criteria Derivation Methodology Human Health, Technical Support Document, Final Draft (U.S. Environmental Protection Agency, Office of Water, EPA-822-B-98-005 (July 1998)). EPA now recommends a hierarchy of preferences for developing fish consumption rates that states can use to derive appropriate water quality criteria. First, EPA recommends that states look to site-specific information on fish consumption rates to develop appropriate fish consumption criteria, with priority given to identifying fish consumption rates of highly exposed populations within a state, particularly sport and subsistence fishermen. Unfortunately, ADEQ does not have reliable data regarding fish consumption rates by sport or subsistence fishermen in Arizona that can be used to develop a revised and more site-specific fish consumption rate for Arizona. Second, EPA recommends that states use data from fish consumption surveys conducted in similar geographic areas and population groups. The EPA technical support document includes descriptions of a number of such surveys, but none of the cited studies were conducted in geographic areas similar to Arizona. Third, EPA recommends that states use information on the intake of fish from national food consumption surveys. EPA recommends that states use national data from the combined 1989, 1990, 1991 Continuing Survey of Food Intake by Individuals survey conducted by the U.S. Department of Agriculture (CSFII). EPA presents a detailed set of fish consumption tables from the CSFII in its technical guidance document. The tables indicate various fish consumption rates for adults, children under 14, and women of child-bearing age (considered to be ages 15 - 44). Based on the national CSFII data, EPA now recommends revised default fish consumption rates of 17.80 grams / day for the general adult population and sport fishermen and 86.30 grams /day for subsistence fishermen. These default consumption rates include consumption of both store-bought and sport-caught fish.

ADEQ considered whether the current methodology to derive the fish consumption criteria should be revised to incorporate a higher fish consumption rate of 17.80 grams / day as recommended by EPA for the general adult population and for sport fishermen. ADEQ decided not to revise the state's current fish consumption criteria using the national fish consumption rate derived from the CSFII because of uncertainty regarding whether the national fish consumption rate, which includes consumption of both sport-caught and store-bought fish, was appropriate for the protection of the health of persons who consume fish taken from Arizona surface waters. Uncertainty over the applicability of the national fish consumption rate exists for two reasons. First, the EPA technical guidance document states that data on national distributions of fish intake by sport fishers and subsistence fishers are unavailable. EPA states in the technical guidance that because of a lack of information on national estimates for fish consumption by sport fishermen, the 17.80 grams / day rate, which approximates the 90th percentile fish intake rate from the CSFII, was *assumed* to represent the average non-marine fish consumption rate of the sport fishermen population. Second, EPA's presentation of information on regional break-outs of the national data set for the CSFII in its technical guidance document calls the national 17.80 grams / day rate into question. The following table is taken from EPA's technical guidance document and it presents regional fish consumption data for the Mountain West states, including Arizona:

Distribution of Finfish and Shellfish Consumption: Mountain

Fresh / Estuarine Fish

Statistic	Estimate (g/day)
Mean	3.23
50th Percentile	0.00
90th Percentile	0.48
95th Percentile	20.90
99th Percentile	78.60

All Fish (including marine fish)

Mean	11.20
50th Percentile	0.00
90th Percentile	39.32
95th Percentile	58.55
99th Percentile	95.84

Source: Ambient Water Quality Criteria Derivation Methodology Human Health, Technical Support Document, Final Draft, U.S. Environmental Protection Agency, Office of Water, EPA-822-B-98-005, July 1998, p. 116.

The mean estimated fish consumption rate in grams / day for fresh water fish in the Mountain West region is 3.23 grams / day and the estimated 90th percentile fish consumption rate is only 0.48 gram / day. These Mountain West fish consumption rates are considerably below the 17.80 grams / day that EPA assumes to be representative of fish consumption rates by sport fishermen and the general adult population nationally. Because of the lack of reliable fish consumption data for Arizona and uncertainty regarding the appropriateness of using the national fish consumption rate of 17.80 grams / day, ADEQ chose to maintain the current methodology for deriving water quality criteria for the fish consumption designated use. The water quality criteria for the fish consumption designated use in the proposed rules is calculated using the 6.5 grams / day fish consumption rate. This fish consumption rate is twice the mean fish consumption rate and more than 13 times the estimated 90th percentile fresh water fish consumption rate for the Mountain West Region. ADEQ decided not to change its current methodology for deriving fish consumption criteria in this triennial review because of the lack of reliable fish consumption data for Arizona.

Bioaccumulation and bioconcentration factors

Some pollutants have the capacity to bioconcentrate in the tissues of aquatic organisms. When this occurs there is a net increase in the amount of the pollutant within the organism. Thus, the concentration of a pollutant in an organism can exceed the concentration of the pollutant in the water column. The ratio of the pollutant concentration in the organism to the pollutant concentration in the water is called the bioconcentration factor, or BCF. In addition to bioconcentration, some pollutants accumulate in aquatic organisms by being passed up the food chain. Examples of pollutants that bioaccumulate include PCBs, DDT, and methyl mercury.

Bioconcentration and bioaccumulation are important factors to consider when developing water quality criteria for the fish consumption (FC) designated use. Humans are at the top of the food chain and they can ingest pollutants that have accumulated in the tissues of the aquatic organisms they harvest and consume. To protect human health, the water quality criteria for the FC designated use must be established at concentrations that are not harmful to human consumers. The criteria must take the bioaccumulation of pollutants in aquatic organisms into account. ADEQ used BCFs that are both chemical-specific and Arizona-specific to derive FC criteria in previous triennial reviews. A complete discussion of the derivation of the BCFs that were used to derive FC water quality criteria is contained in the 1992 and 1996 human health rationale documents. ADEQ does not propose to change the use of BCFs to derive water quality criteria for the FC designated use in this triennial review.

EPA recently proposed to use bioaccumulation factors (BAFs) to derive water quality criteria to protect human health [*See Ambient Water Quality Criteria Derivation Methodology - Human Health, Technical Support Document, Final Draft*, §2.4.1, pp. 165-166]. A BAF is the ratio of a pollutant concentration in tissue to the concentration in water and it takes into account the uptake of pollutants through contaminated food, sediment, and water. Chemicals with larger BAFs reflect greater bioaccumulation in fish tissues compared to chemicals with lower BAFs. EPA now recommends that states use BAFs instead of BCFs to derive water quality criteria. This contrasts with EPA's 1980 AWQC National Guidelines for deriving human health criteria. EPA previously relied on BCFs to derive human health criteria. In contrast to the BAF, the BCF measures the uptake of chemicals into fish that have been exposed only through water, not food or sediment. EPA recommends the use of BAFs as being superior to BCFs for deriving water quality criteria to protect human health because BAFs account for uptake from all sources of waterborne exposure of a pollutant to an organism.

ADEQ reviewed EPA's technical recommendations and is considering revisions to the methodology for deriving the water quality criteria for the FC designated use. ADEQ invites public comment on whether ADEQ should revise the current methodology for deriving fish consumption criteria to include BAFs instead of BCFs. For purposes of the proposed rules, ADEQ did not change methodologies and used the same BCFs to calculate the FC criteria.

ADEQ proposes to adopt new criteria for the following pollutants for the FC designated use.

Dalapon	161,538 µg / L
Dinoseb	158 µg / L
Diquat	23, 692 µg / L
Endothall	215,385 µg / L
Glyphosate	1,076,923 µg / L
Picloram	24,318 µg / L
Simazine	10,769 µg / L

ADEQ proposes to revise the criteria for the following pollutants for the FC designated use based upon revised q1*s or RfDs, the withdrawal or unavailability of q1*s or RfDs, or changes in rounding conventions:

Acenaphthene	2600 µg / L to 2568 µg / L
Acrolein	750 µg / L to 23.9 µg / L
Anthracene	6300 µg / L to 6343 µg / L
Antimony (T)	140 µg / L to 154 µg / L
Benzene	120 µg / L to 239 µg / L
Benz(a)anthracene	0.00008 µg / L to NNS
Benzo(k)fluoranthene	0.00001 µg / L to NNS
3,4 - Benzo(k)fluoranthene	0.00004 µg / L to NNS
Beryllium (T)	0.21 µg / L to 1,795 µg / L
Bis (2-chloroisopropyl) ether	15,000 µg / L to 35,897 µg / L
Bromodichloromethane	22 µg / L to 11.6 µg / L
Bromoform	80 µg / L to 341 µg / L
Bromomethane	7500 µg / L to 5026 µg / L
Butyl benzyl phthalate	5000 µg / L to 5008 µg / L
Cadmium (T)	41 µg / L to 41.4 µg / L
Carbon tetrachloride	5.5 µg / L to 5.52 µg / L
Chlordane	0.001 µg / L to 0.005 µg / L
Chlorobenzene	500 µg / L to 514 µg / L

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Chloroform	590 µg / L to 588 µg / L
Chloronapthalene beta	13,000 µg / L to 13,295 µg / L
2-Chlorophenol	2100 µg / L to 2154 µg / L
Chromium III	67,000 µg / L to 1,009,615 µg / L
Chromium VI	3,400 µg / L to 2,019 µg / L
Chrysene	.0001 µg / L to NNS
Cyanide	210,000 µg / L to 215,385 µg / L
Dibenz (ah) anthracene	0.00003 µg / L to NNS
Dibromochloromethane	12 µg / L to 8.55 µg / L
Dibutyl phthalate	2300 µg / L to 159 µg / L
1,2 - Dichlorobenzene	2800 µg / L to 2761 µg / L
1,3 - Dichlorobenzene	2000 µg / L to NNS
1,4 - Dichlorobenzene	1200 µg / L to 35,601 µg / L
3,3'-Dichlorobenzidine	0.09 µg / L to 0.091 µg / L
p,p'-Dichlorodiphenyldichloroethane (DDD)	0.0009 µg / L to 0.001 µg / L
p,p'-Dichlorodiphenyldichloroethylene (DDE)	0.0006 µg / L to 0.012 µg / L
p,p'-Dichlorodiphenyltrichloroethane (DDT)	0.0005 µg / L to 0.0004 µg / L
1,2 - Dichloroethane	120 µg / L to 118 µg / L
1,2 - trans- Dichloroethylene	13,000 µg / L to 13,462 µg / L
1,1- Dichloroethylene	4.5 µg / L to 321 µg / L
Dichloromethane	480 µg / L to 479 µg / L
2,4 - Dichlorophenol	810 µg / L to 808 µg / L
1,2 - Dichloropropane	NNS to 161,538 µg / L
1,3 - Dichloropropene	6.6 µg / L to 646 µg / L
Diethyl phthalate	110,000 µg / L to 113,360 µg / L
2,4 - Dimethylphenol	2200 µg / L to 2198 µg / L
Dimethyl phthalate	2,800,000 µg / L to NNS
4,6 - Dinitro -o-cresol	120 µg / L to 3077 µg / L
2,4 - Dinitrophenol	5400 µg / L to 3590 µg / L
2,6 - Dinitrotoluene	NNS to 1.98 µg / L
Di -n-octyl phthalate	NNS to 3084 µg / L
Endosulfan sulfate	0.78 µg / L to NNS
Endrin	1.1 µg / L to 1.15 µg / L
Endrin aldehyde	0.81 µg / L to NNS
Ethylbenzene	110,000 µg / L to 107,692 µg / L
Fluoranthene	130 µg / L to 15,569 µg / L
Fluorene	580 µg / L to 33,946 µg / L
Heptachlor	0.0002 µg / L to 0.0004 µg / L

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Hexachlorocyclohexane gamma	0.02 µg / L to 6.37 µg / L
Indeno (1,2,3-cd) pyrene	0.000003 µg / L to NNS
Isophorone	2300 µg / L to 2267 µg / L
Mercury	0.6 µg / L to 1.66 µg / L
Napthalene	NNS to 71,795 µg / L
Nickel	730 µg / L to 733 µg / L
Nitrobenzene	600 µg / L to 598 µg / L
N-nitrosodimethylamine	2.1 µg / L to 0.88 µg / L
N-nitrosodi-n-propylamine	0.51 µg / L to 0.385 µg / L
Pentachlorophenol	8.2 µg / L to 1.13 µg / L
Phenol	6,500,000 µg / L to 6,461,538 µg / L
PCBs	0.00009 µg / L to 0.013 µg / L
Pyrene	1100 µg / L to 1090 µg / L
Selenium	9000 µg / L to 8964 µg / L
Silver	NNS to 5983 µg / L
2,3,7,8-TCDD (Dioxin)	0.000000004 µg / L to 0.002 µg / L
Tetrachloroethylene	11 µg / L to 4487 µg / L
Thallium	41 µg / L to 39.2 µg / L
Toluene	90,000 µg / L to 89,744 µg / L
Toxaphene	0.0008 µg / L to 0.001 µg / L
1,2,4-Trichlorobenzene	155 µg / L to 156 µg / L
Trichloroethylene	NNS to 195,804 µg / L
2,4,6 - Trichlorophenol	4.9 µg / L to 4.89 µg / L
Vinyl chloride	620 µg / L to 15 µg / L
Zinc	22,000 µg / L to 21,830 µg / L

Update full body contact recreation criteria in Appendix A

The criteria for the full body contact recreation (FBC) designated use are intended to protect people from exposure to pollutants when they are swimming. To develop FBC criteria, ADEQ made assumptions regarding possible human exposure to pollutants while swimming. Ingestion and dermal contact are two common exposure pathways to pollutants while swimming. However, there is little reliable data to support the derivation of FBC criteria based on dermal contact exposures to pollutants. Consequently, ADEQ developed the current FBC criteria based on assumptions regarding oral ingestion of water while swimming.

An individual may incidentally ingest some water when he or she swims in a surface water. ADEQ derived the current water quality criteria for FBC assuming an incidental water ingestion rate of 50 ml / day. This value is based upon EPA Superfund risk assessment guidelines which suggest that an average mouthful of water may be 50 ml. ADEQ derived the current FBC criteria assuming an exposure from ingesting 50 ml of water during an estimated average of 1 hour of swimming per day. The following equation was used to derive criteria for carcinogens:

$$q_1^* = \frac{70 \times 10^{-6}}{0.05 \text{ L / day}}$$

ADEQ derived water quality for noncarcinogens using the following equation:

$$\frac{\text{RfD} \times 70}{0.05 \text{ L / day}}$$

In these equations, 70 is the average weight of a human male in kilograms, 10^{-6} is the excess cancer risk level, 0.05 is the estimated water consumption rate due to swimming in liters / day, q_1^* is cancer potency slope in mg / kg / day, and Rfd is the reference dose in mg / kg / day.

The available literature on recreational exposures to pollutants combined with assumptions about the average mouthful of water ingested for every hour of total body contact recreation can be used to determine an alternative incidental ingestion rate. EPA now recommends an incidental water ingestion rate of 10 ml / day in the Ambient Water Quality Criteria Derivation Methodology Human Health, Technical Support Document, Final Draft, §2.3.2.4, p. 123. This estimate is based on an assumption that an individual may be in total contact with surface water for 123 hours a year (i.e., an hour of swimming per day throughout 4 summer months) and may ingest 30 ml of water per hour of total contact. EPA's recommended ingestion rate of 10 ml / day may be appropriate for situations where exposure to pollutants while swimming occurs for one hour daily for about 4 months. However, EPA recognizes that states in warmer climates may wish to use higher incidental water ingestion rates to protect individuals who may swim in lakes or rivers for a greater portion of the year. ADEQ considered revising the current incidental ingestion rate of 50 ml / day to EPA's recommended incidental ingestion rate of 10 ml / day for the FBC designated use. However, ADEQ decided to retain the higher incidental water ingestion rate of 50 ml / day because of Arizona's warmer climate and the potential for greater exposure to pollutants by swimming.

ADEQ proposes to revise some FBC criteria that are artificially low because of a policy decision that was made in a previous triennial review that relates to the derivation of criteria for the partial body contact recreation (PBC) designated use. After ADEQ derived numeric criteria for the FBC and PBC designated uses in the 1992 triennial review, ADEQ found that for some pollutants, the numeric criterion for the FBC designated use was less stringent than the numeric criterion calculated to protect the PBC designated use. For other pollutants the FBC criterion was more stringent than the water quality criterion for the DWS designated use. Based on assumptions regarding relative exposures to pollutants in surface water, one would expect that the FBC criteria would be more stringent than the criteria for the PBC designated use and less stringent than the DWS criteria. However, the numeric criteria for the DWS, FBC, and PBC designated uses did not always reflect this logic because different methodologies were used to derive the criteria for each designated use. Consequently, ADEQ made two policy decisions regarding the FBC criteria in the 1992 triennial review. First, whenever a calculated numeric criterion for the FBC designated use was less stringent than the numeric criterion to protect the PBC designated use, ADEQ "defaulted" to the more stringent criterion PBC criterion. Second, whenever a FBC criterion was calculated to be more stringent than a DWS criterion, the DWS criterion was used to maintain and protect water quality for the FBC designated use. In the latter case, this occurred for 4 pollutants that had a less stringent DWS criterion based on MCLs with an excess cancer risk level higher than 10^{-6} . ADEQ believes that the use of Safe Drinking Water Act MCLs to protect the FBC designated use is reasonable, even when the MCL is less stringent than a criterion calculated using the FBC methodology.

ADEQ proposes to abandon the EBASCO methodology that was used to calculate the PBC criteria in previous triennial reviews and does not believe it makes sense to "default" to more stringent criteria for the PBC designated use that were calculated using that methodology. ADEQ proposes to revise the criteria derivation methodology for the PBC designated use [See discussion below]. The PBC criteria calculated using the EBASCO methodology assume an incidental water ingestion rate that is 10 times higher than the exposure assumption used to derive the FBC criteria. ADEQ used a PBC criteria derivation methodology suggested by the regulated community during the 1992 triennial review and published in Proposed Human Health Ambient Water Quality Standards for Arizona, (EBASCO Environmental, 1990). ADEQ has reconsidered the exposure assumptions used in the EBASCO methodology for calculating the PBC criteria. An incidental water ingestion rate for the PBC designated use that is 10 times higher than that used for the FBC designated use is unreasonable. Given the lack of data on incidental ingestion or dermal exposure to pollutants through PBC recreation, ADEQ continues to rely on an assumed incidental water ingestion rate as a surrogate measure to derive criteria for the PBC designated use. However, ADEQ rejects the use of an incidental water ingestion rate for PBC that is 10 times higher than the one used for the FBC designated use. ADEQ proposes to use essentially the same methodology to derive water quality criteria for both the FBC and PBC designated uses. The result of this proposed approach is that ADEQ will no longer "default" to more stringent PBC criteria. The practical result of this approach is that many FBC criteria become less stringent by a factor of 10. Also, ADEQ proposes to update the criteria for FBC and PBC designated uses using current q_1^* s and RfDs from IRIS. ADEQ proposes to revise the following numeric criteria for the FBC designated use:

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Acenaphthene	8400 µg / L to 84,000 µg / L
Acrolein	2200 µg / L to 700 µg / L
Acrylonitrile	2.6 µg / L to 2.59 µg / L
Alachlor	1400 µg / L to 14,000 µg / L
Anthracene	42,000 µg / L to 420,000 µg / L
Antimony	56 µg / L to 560 µg / L
Atrazine	4900 µg / L to 49,000 µg / L
Barium	9800 µg / L to 98,000 µg / L
Benzene	48 µg / L to 93.3 µg / L
Benzidine	0.006 µg / L to 0.01 µg / L
Benz(ah)anthracene	0.12 µg / L to NNS
Benzo(a)pyrene	0.2 µg / L to 0.19 µg / L
Benzo(k)fluoranthene	0.12 µg / L to NNS
3,4-Benzofluoranthene	0.12 µg / L to NNS
Beryllium	4 µg / L to 2800 µg / L
Bis (2-chloroethyl) ether	1.3 µg / L to 1.27 µg / L
Bis (2-chloroisopropyl) ether	5600 µg / L to 56,000 µg / L
Boron	12,600 µg / L to 126,000 µg / L
Bromoform	180 µg / L to 177 µg / L
Bromomethane	200 µg / L to 1,960 µg / L
Butyl benzyl phthalate	28,000 µg / L to 280,000 µg / L
Cadmium	70 µg / L to 700 µg / L
Carbofuran	700 µg / L to 7,000 µg / L
Carbon tetrachloride	11 µg / L to 10.8 µg / L
Chlordane	2 µg / L to 4 µg / L
Chlorine (total residual)	14,000 µg / L to 140,000 µg / L
Chlorobenzene	2800 µg / L to 28,000 µg / L
Chloronaphthalene beta	11,000 µg / L to 112,000 µg / L
2-Chlorophenol	700 µg / L to 7,000 µg / L
Chromium III	140,000 µg / L to 2,100,000 µg / L
Chromium VI	700 µg / L to 4,200 µg / L
Chromium (total)	NNS to 100 µg / L
Chrysene	0.12 µg / L to NNS
Copper	5200 µg / L to 1,300 µg / L
Cyanide	2800 µg / L to 28,000 µg / L
Dalapon	NNS to 42,000 µg / L
Di (2-ethylhexyl) adipate	NNS to 1,167 µg / L
Di (2-ethylhexyl) phthalate	NNS to 100 µg / L

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Dibenz (ah) anthracene	0.12 µg / L to NNS
Dibromochloromethane	17 µg / L to 100 µg / L (TTHM)
1,2-Dibromo-3-chloropropane (DBCP)	NNS to 2,800 µg / L
1,2-Dibromoethane (EDB)	1.6 µg / L to 0.05 µg / L
Dibutyl phthalate	14,000 µg / L to 140,000 µg / L
1,2-Dichlorobenzene	13,000 µg / L to 126,000 µg / L
1,3-Dichlorobenzene	1880 µg / L to NNS
1,4-Dichlorobenzene	1880 µg / L to 560,000 µg / L
3,3'-Dichlorobenzidine	3.1 µg / L to 3.11 µg / L
p,p'-Dichlorodiphenyldichloroethane (DDD)	5.8 µg / L to 5.83 µg / L
p,p'-Dichlorodiphenyldichloroethylene (DDE)	4.1 µg / L to 4.12 µg / L
p,p'-Dichlorodiphenyltrichloroethane (DDT)	4.1 µg / L to 4.12 µg / L
1,2-Dichloroethane	15 µg / L to 15.4 µg / L
1,1-Dichloroethylene	7 µg / L to 233 µg / L
1,2-cis-Dichloroethylene	NNS to 70 µg / L
1,2-trans-Dichloroethylene	2800 µg / L to 28,000 µg / L
Dichloromethane	190 µg / L to 187 µg / L
2,4-Dichlorophenol	420 µg / L to 4,200 µg / L
2,4-Dichlorophenoxyacetic acid (2,4-D)	1400 µg / L to 14,000 µg / L
1,2-Dichloropropane	NNS to 126,000 µg / L
1,3-Dichloropropene	7.8 µg / L to 420 µg / L
Diethyl phthalate	110,000 µg / L to 1,120,000 µg / L
2,4-Dimethylphenol	2800 µg / L to 28,000 µg / L
Dimethyl phthalate	1,400,000 µg / L to NNS
4,6-Dinitro-o-cresol	55 µg / L to 5,600 µg / L
2,4-Dinitrophenol	280 µg / L to 2,800 µg / L
2,4-Dinitrotoluene	280 µg / L to 2,800 µg / L
2,6-Dinitrotoluene	NNS to 2.06 µg / L
Di-n-octyl-phthalate	NNS to 560,000 µg / L
Dinoseb	NNS to 1,400 µg / L
1,2-Diphenylhydrazine	1.8 µg / L to 1.75 µg / L
Diquat	NNS to 3,080 µg / L
Endosulfan sulfate	7 µg / L to NNS
Endosulfan (total)	840 µg / L to 8,400 µg / L
Endothall	NNS to 28,000 µg / L
Endrin	40 µg / L to 420 µg / L
Endrin aldehyde	420 µg / L to NNS
Ethylbenzene	14,000 µg / L to 140,000 µg / L

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Fluoranthene	5600 µg / L to 56,000 µg / L
Fluorene	5600 µg / L to 56,000 µg / L
Fluoride	8400 µg / L to 84,000 µg / L
Glyphosate	NNS to 140,000 µg / L
Hexachlorocyclohexane gamma (lindane)	1 µg / L to 420 µg / L
Hexachlorocyclopentadiene	1000 µg / L to 9,800 µg / L
Indeno (1,2,3-cd) pyrene	0.12 µg / L to NNS
Isophorone	1500 µg / L to 1,474 µg / L
Lead	NNS to 15 µg / L
Manganese	19,600 µg / L to 196,000 µg / L
Mercury	42 µg / L to 420 µg / L
Methoxychlor	700 µg / L to 7,000 µg / L
Napthalene	NNS to 28,000 µg / L
Nickel	2,800 µg / L to 28,000 µg / L
Nitrate	224,000 µg / L to 2,240,000 µg / L
Nitrite	14,000 µg / L to 140,000 µg / L
Nitrobenzene	70 µg / L to 700 µg / L
N-Nitrosodiphenylamine	290 µg / L to 286 µg / L
Oxamyl	NNS to 35,000 µg / L
Phenol	84,400 µg / L to 840,000 µg / L
Picloram	NNS to 98,000 µg / L
Polychlorinated biphenyls (PCBs)	0.5 µg / L to 28 µg / L
Pyrene	4,200 µg / L to 42,000 µg / L
Radium 226, 228	NNS to 5 pCi / L
Selenium	700 µg / L to 7,000 µg / L
Silver	NNS to 7,000 µg / L
Simazine	NNS to 7,000 µg / L
Styrene	28,000 µg / L to 280,000 µg / L
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.00009 µg / L to 1.40 µg / L
Tetrachloroethylene	35 µg / L to 14,000 µg / L
Thallium	12 µg / L to 112 µg / L
Toluene	28,000 µg / L to 280,000 µg / L
Toxaphene	3 µg / L to 1.27 µg / L
1,2,4-Trichlorobenzene	1400 µg / L to 14,000 µg / L
1,1,1-Trichloroethane	NNS to 200 µg / L
1,1,2-Trichloroethane	25 µg / L to 24.6 µg / L
Trichloroethylene	NNS to 280,000 µg / L
2,4,6-Trichlorophenol	130 µg / L to 127.3 µg / L

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2-(2,4,5-Trichlorophenoxy) propionic acid	1120 µg / L to 11,200 µg / L
2,4,5-Trichlorophenoxyacetic acid	NNS to 14,000 µg / L
Vinyl chloride	80 µg / L to 2 µg / L
Xylenes	280,000 µg / L to 2,800,000 µg / L
Zinc	42,000 µg / L to 420,000 µg / L

Recalculation of the partial body contact recreation (PBC) water quality criteria

In the 1992 triennial review of surface water quality standards, ADEQ originally proposed that no water quality criteria be adopted for the PBC designated use because of the lack of an accepted methodology to derive the criteria and a lack of data regarding incidental ingestion of water or dermal exposures to pollutants. During the 1992 triennial review, a methodology to derive water quality criteria for the PBC designated use was recommended by members of the regulated community. The recommendations were published in Proposed Human Health Ambient Water Quality Standards for Arizona (EBASCO Environmental, et. al., 1990). The EBASCO recommendations for deriving criteria for the PBC designated use included the following:

1. The PBC designated use would be applied to ephemeral waters and effluent dominated waters whose primary use is aesthetic and whose flow characteristics limit the likelihood of exposure. It is proposed that the definition of PBC relate to the frequency and duration of incidental exposure based on the expected use of these waters. PBC should be defined in a toxicologically relevant manner that permits a dose estimate to be made. Because exposure through ingestion or exposure to sensitive body organs is unlikely to occur, then those instances of exposure can be assumed to be infrequent and to occur at sporadic intervals.
2. The relevant human health concern for purposes of establishing water quality standards for PBC is from acutely toxic effects and not from effects that cause chronic toxicity.
3. If acutely toxic health effects are possible, then consideration of a “maximally exposed individual” is appropriate instead of the most likely exposed individual.
4. The maximally exposed individual could be postulated to be one who may have consumed as much as 0.5 liter (about 1 pint) of water during a single day or who incidentally consumed an equal amount as a result of several exposures. The most likely exposure would be a person who immersed part of his or her body (e.g., waded) in the water.
5. It is recommended that the short term health advisory value be used to establish the permissible water limits for chemical contaminants and that this should be corrected for the consumption of 0.5 liter instead of 2 liters.
6. If health advisory levels are unavailable, then it is proposed that reference dose (Rfd) based on chronic oral administration be used and, if appropriate, adjusted upward to reflect the need to protect against acute toxicity. It is proposed that the dose for a 70 kg adult be calculated and an allowable water concentration based on a 0.5 liter consumption.
7. If health advisory levels are unavailable, it is proposed that a non-carcinogenic risk assessment be used based on No Observed Effects Levels (NOAEL) determined from short term toxicity data and the numbers be adjusted with safety factors based on EPA protocols used to produce health advisory levels. If insufficient toxicological data are available for a particular compound, then data for analagous compounds should be used. This may be appropriate for certain polynuclear aromatic hydrocarbons, phenols, and phthalate esters.

ADEQ followed the EBASCO recommendations to derive water quality criteria for the PBC designated use. The EBASCO approach was admittedly conservative and probably more stringent than what was necessary to protect human health from the types of exposures to pollutants normally expected during partial body contact recreation. The exposure assumption of 0.5 liter of water ingested incidentally or accidentally during a single day of partial body contact recreation was used to derive the PBC criteria. ADEQ used the following decision hierarchy to derive criteria for PBC:

1. Use one-day children’s health advisories to protect the PBC designated use where available,
2. Use the EBASCO method to derive PBC criteria and assume that the “maximally exposed individual” will ingest 0.5 liters of water during partial body contact recreation.
3. If an MCL is less stringent than the PBC criterion that results from using either the one-day children’s health advisory or the EBASCO method, then use the MCL.

As noted earlier, a common sense approach based on expected exposures to pollutants in surface water should result in water quality criteria for PBC that are less stringent than FBC criteria and FBC criteria that are less stringent than the DWS criteria. However, as noted earlier, the human health criteria in Table 1 of Appendix A did not always reflect this logic because of differences in the methodologies that were used to derive the criteria for each designated use. Sometimes, a PBC criterion was calculated using the EBASCO methodology that was more stringent than the FBC criterion for the same pollutant. Whenever this happened, ADEQ “defaulted” to the more stringent PBC criterion and the more stringent PBC criterion was adopted for both the FBC and PBC designated uses.

ADEQ has reconsidered the use of the EBASCO methodology to derive water quality for the PBC designated use. ADEQ believes that the use of the EBASCO methodology drives FBC and PBC human health criteria to overly stringent levels. ADEQ proposes to abandon the EBASCO methodology for deriving criteria for the PBC designated use because the methodology uses an unreasonable incidental water ingestion exposure assumption. The EBASCO incidental ingestion rate for PBC (i.e., 0.5 liter or 500 ug/L) is 10 times the incidental ingestion rate used to derive the FBC criteria (0.05 mg / L or 50 ug/L). Common sense tells us that the incidental water ingestion rates for the two designated uses should be reversed. That is, the incidental water ingestion rate assumed for FBC should be higher than the assumed incidental water ingestion rate for PBC. ADEQ believes that the incidental ingestion rate of 0.05 mg/L for the FBC designated use is a more reasonable exposure assumption for the PBC designated use. In the absence of reliable data to derive PBC criteria based on dermal exposures or another incidental water ingestion rate, ADEQ proposes to rely on the exposure assumptions in the FBC methodology to derive criteria for *both* the FBC and PBC designated uses. A FBC criterion should be adequately protective of water quality for the PBC designated use. If one can safely swim in a surface water, it should be adequately protected for partial body contact recreation.

Finally, ADEQ proposes to employ only noncarcinogenic endpoints to derive criteria for PBC. This approach is consistent with the EBASCO methodology recommendation to use a reference dose (Rfd) based on oral ingestion. Carcinogenic endpoints are not appropriate for the derivation of PBC criteria because they are based upon chronic exposures to pollutants. ADEQ proposes to use the following methodology to derive PBC criteria:

$$\frac{\text{Rfd} \times 70}{0.05}$$

Where Rfd is the reference dose, 70 is the average weight of the human male in kilograms, and 0.05 is estimated incidental water ingestion rate in liters per day. This is the same methodology used to derive FBC criteria for noncarcinogens. ADEQ revised the current numeric water quality criteria for the PBC designated use using this criteria derivation methodology.

Where an Rfd for a pollutant is unavailable, ADEQ proposes to use Minimum Risk Levels (MRLs) for hazardous substances developed by the Agency for Toxic Substances and Disease Registry (ATSDR) to derive PBC criteria. ATSDR’s development of MRLs is a response to a mandate found in the Comprehensive Environmental Response, Compensation, and Liability Act as amended by the Superfund Amendments and Reauthorization Act. Federal Superfund law requires ATSDR, in cooperation with EPA, to develop a list of hazardous substances commonly found at Superfund sites, prepare toxicological profiles for each substance included on the list of hazardous substances, and ascertain significant human exposure levels for hazardous substances in the environment and the associated acute, subacute, and chronic human health effects.

An ATSDR minimum risk level (MRL) is similar to an EPA reference dose (Rfd). An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of an adverse noncancer health effect over a specified duration of exposure. MRLs are derived for acute (1 to 14 days), intermediate (15 to 364 days), and chronic exposures (365 days or longer) and for oral and inhalation routes of exposure. Currently, MRLs for the dermal route of exposure are not derived because ATSDR has not yet identified a method suitable for this route of exposure. ADEQ proposes to use oral MRLs to derive PBC criteria when an Rfd is not available. ADEQ proposes to use chronic oral exposure MRLs first, intermediate exposure MRLs if chronic exposure MRLs are unavailable, and acute oral exposure MRLs if both chronic and intermediate oral exposure MRLs are unavailable. The MRL will be substituted in the above equation for the Rfd.

MRLs are intended to serve as screening levels to identify contaminants with potential health effects of concern. MRLs are derived only when ATSDR determines that reliable and sufficient data exist to identify target organs or the most sensitive health effect for a specific duration for a given route of exposure to a hazardous substance. Like RfDs, MRLs are based on noncancer health effects only. Oral MRLs are expressed as daily human doses in units of milligrams per kilogram per day (mg / kg / day).

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ATSDR uses the no observed adverse effect level / uncertainty factor approach to derive MRLs for hazardous substances. The MRLs are set below levels that, based on current information, might cause adverse health effects in people who are most sensitive to a substance-induced health effect. The MRLs are generally based on the most sensitive substance-induced end point that ATSDR considers to be of relevance to humans. MRLs contain uncertainty because of the lack of precise toxicological information on vulnerable populations who may be most sensitive to the effects of hazardous substances (e.g., infants, elderly, and immunologically compromised people). For this reason, ATSDR uses a conservative approach to address these uncertainties consistent with the public health principle of prevention. Although human health effects data are preferred, MRLs often are based on animal studies because relevant human health effects studies are lacking. In the absence of evidence to the contrary, ATSDR assumes that humans are more sensitive than animals to the effects of hazardous substances and that certain persons may be particularly sensitive to exposure to hazardous substances [e.g. immunologically compromised persons]. Thus, an MRL may be set at a level below that which is shown to be nontoxic in animals.

MRLs undergo a rigorous review process. They are reviewed by the Health Effects / MRL Workgroup within the ATSDR Division of Toxicology; an expert panel of external peer reviewers, an agency-wide MRL Workgroup with participation from other federal agencies, including EPA. MRLs also are submitted for public comment through the toxicological profile public comment period. Each MRL is subject to change as new information becomes available and the toxicological profile for a hazardous substance is updated. ADEQ derived PBC criteria using MRLs for 17 pollutants. They are: acrolein, acrylonitrile, hexachlorocyclohexane-alpha, hexachlorocyclohexane-beta, 1,4-Dichlorobenzene, 1,2-Dibromo-3-chloropropane, 1,2-Dichloroethane, 1,2-Dichloropropane, 4,6-Dinitro-o-cresol, 2,6-Dinitrotoluene, Di-n-octyl phthalate, Hexachlorobutadiene, N-Nitrosodi-n-propylamine, 2,3,7,8-Tetrachlorodibenzo-p-dioxin, 1,1,2,2-Tetrachloroethane, Toxaphene, and Trichloroethylene.

For pollutants identified as carcinogens with q1*s, but that do not have a Rfd or MRL available, ADEQ proposes to use the full body contact criterion to protect the partial body contact designated use. This situation occurs for 8 pollutants, including benzene, benzo(a)pyrene, bis (chloroethyl) ether, 1,2-diphenylhydrazine, n-nitrosodimethylamine, n-nitrosodiphenylamine, 1,1,1-trichloroethane, and 2,4,6-trichlorophenol. For pollutants for which there is no q1*, Rfd, or MRL but there is an MCL or an action level [e.g. lead and copper], ADEQ proposes to use the MCL or action level to protect the partial body contact designated use. This situation occurs for 7 pollutants, including total chromium, copper, 1,2-dibromoethane, 1,2-cis-dichloroethylene, lead, and radium- 226, and radium-228.

ADEQ proposes to revise the numeric criteria for the PBC designated use as follows:

Acenaphthene	8400 µg / L to 84,000 µg / L
Acrolein	2200 µg / L to 700 µg / L
Acrylonitrile	NNS to 56,000 µg / L
Alachlor	1400 µg / L to 14,000 µg / L
Aldrin	4.2 µg / L to 42 µg / L
Anthracene	42,000 µg / L to 420,000 µg / L
Antimony	56 µg / L to 560 µg / L
Arsenic	50 µg / L to 420 µg / L
Atrazine	4900 µg / L to 49,000 µg / L
Barium	9800 µg / L to 98,000 µg / L
Benzene	NNS to 93.3 µg / L
Benzidine	420 µg / L to 4,200 µg / L
Benzo(a)pyrene	NNS to 0.19 µg / L
Beryllium	700 µg / L to 2,800 µg / L
Bis (2-chloroethyl) ether	NNS to 1.27 µg / L
Bis (2-chloroisopropyl) ether	5600 µg / L to 56,000 µg / L
Boron	12,600 µg / L to 126,000 µg / L
Bromodichloromethane	2,800 µg / L to 28,000 µg / L

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Bromoform	2,800 µg / L to 28,000 µg / L
Bromomethane	200 µg / L to 1,960 µg / L
Butyl benzyl phthalate	28,000 µg / L to 280,000 µg / L
Cadmium	70 µg / L to 700 µg / L
Carbofuran	700 µg / L to 7,000 µg / L
Carbon tetrachloride	98 µg / L to 980 µg / L
Chlordane	8.4 µg / L to 700 µg / L
Chlorine (total residual)	14,000 µg / L to 140,000 µg / L
Chlorobenzene	2800 µg / L to 28,000 µg / L
Chloroform	1400 µg / L to 14,000 µg / L
Chloronaphthalene beta	11,000 µg / L to 112,000 µg / L
2-Chlorophenol	700 µg / L to 7000 µg / L
Chromium III	140,000 µg / L to 2,100,000 µg / L
Chromium VI	700 µg / L to 4,200 µg / L
Chromium (total)	NNS to 100 µg / L
Copper	5200 µg / L to 1,300 µg / L
Cyanide	2800 µg / L to 28,000 µg / L
Dalapon	NNS to 42,000 µg / L
Di (2-ethylhexyl) adipate	NNS to 1,167 µg / L
Di (2-ethylhexyl) phthalate	NNS to 100 µg / L
Dibromochloromethane	2800 µg / L to 28,000 µg / L
1,2-Dibromo-3-chloropropane (DBCP)	NNS to 2,800 µg / L
1,2-Dibromoethane (EDB)	NNS to 0.05 µg / L
Dibutyl phthalate	14,000 µg / L to 140,000 µg / L
1,2-Dichlorobenzene	13,000 µg / L to 126,000 µg / L
1,3-Dichlorobenzene	1880 µg / L to NNS
1,4-Dichlorobenzene	1880 µg / L to 560,000 µg / L
3,3'-Dichlorobenzidine	NNS to 3.11 µg / L
p,p'-Dichlorodipenyldichloroethane (DDD)	NNS to 5.83 µg / L
p,p'-Dichlorodipenyldichloroethylene (DDE)	NNS to 4.12 µg / L
p,p'-Dichlorodiphenyltrichloroethane (DDT)	70 µg / L to 700 µg / L
1,2-Dichloroethane	NNS to 280,000 µg / L
1,1-Dichloroethylene	1300 µg / L to 12,600 µg / L
1,2-cis-Dichloroethylene	NNS to 70 µg / L
1,2-trans-Dichloroethylene	2800 µg / L to 28,000 µg / L
Dichloromethane	8400 µg / L to 84,000 µg / L
2,4-Dichlorophenol	420 µg / L to 4,200 µg / L
2,4-Dichlorophenoxyacetic acid (2,4-D)	1400 µg / L to 14,000 µg / L

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1,2-Dichloropropane	NNS to 126,000 µg / L
1,3-Dichloropropene	42 µg / L to 420 µg / L
Dieldrin	70 µg / L to 700 µg / L
Diethyl phthalate	110,000 µg / L to 1,120,000 µg / L
Di (2-ethylhexyl) adipate	NNS to 840,000 µg / L
Di (2-ethylhexyl) phthalate	2800 µg / L to 28,000 µg / L
2,4-Dimethylphenol	2800 µg / L to 28,000 µg / L
Dimethyl phthalate	1,400,000 µg / L to NNS
4,6-Dinitro-o-cresol	55 µg / L to 5,600 µg / L
2,4-Dinitrophenol	280 µg / L to 2,800 µg / L
2,4-Dinitrotoluene	280 µg / L to 2,800 µg / L
2,6-Dinitrotoluene	NNS to 5,600 µg / L
Di-n-octyl-phthalate	NNS to 560,000 µg / L
Dinoseb	NNS to 1,400 µg / L
1,2-Diphenylhydrazine	NNS to 1.75 µg / L
Diquat	NNS to 3,080 µg / L
Endosulfan sulfate	7 µg / L to NNS
Endosulfan (total)	840 µg / L to 8,400 µg / L
Endothall	NNS to 28,000 µg / L
Endrin	40 µg / L to 420 µg / L
Endrin aldehyde	420 µg / L to NNS
Ethylbenzene	14,000 µg / L to 140,000 µg / L
Fluoranthene	5600 µg / L to 56,000 µg / L
Fluorene	5600 µg / L to 56,000 µg / L
Fluoride	8400 µg / L to 84,000 µg / L
Glyphosate	NNS to 140,000 µg / L
Heptachlor	70 µg / L to 700 µg / L
Heptachlor epoxide	2 µg / L to 18.2 µg / L
Hexachlorobenzene	280 µg / L to 1,120 µg / L
Hexachlorobutadiene	NNS to 280 µg / L
Hexachlorocyclohexane alpha	NNS to 11,200 µg / L
Hexachlorocyclohexane beta	NNS to 840 µg / L
Hexachlorocyclohexane gamma (lindane)	42 µg / L to 420 µg / L
Hexachlorocyclopentadiene	1000 µg / L to 9,800 µg / L
Hexachloroethane	140 µg / L to 1,400 µg / L
Isophorone	28,000 µg / L to 280,000 µg / L
Lead	NNS to 15 µg / L
Manganese	19,600 µg / L to 196,000 µg / L

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Mercury	42 µg / L to 420 µg / L
Methoxychlor	700 µg / L to 7,000 µg / L
Napthalene	NNS to 28,000 µg / L
Nickel	2,800 µg / L to 28,000 µg / L
Nitrate	224,000 µg / L to 2,240,000 µg / L
Nitrite	14,000 µg / L to 140,000 µg / L
Nitrobenzene	70 µg / L to 700 µg / L
N-Nitrosomethylamine	NNS to 0.03 µg / L
N-Nitrosodiphenylamine	NNS to 286 µg / L
N-Nitrosodi-n-propylamine	NNS to 133,000 µg / L
Oxamyl	NNS to 35,000 µg / L
Pentachlorophenol	2000 µg / L to 42,000 µg / L
Phenol	84,000 µg / L to 840,000 µg / L
Picloram	NNS to 98,000 µg / L
Polychlorinated biphenyls (PCBs)	NNS to 28 µg / L
Pyrene	4,200 µg / L to 42,000 µg / L
Radium 226, 228	NNS to 5 pCi / L
Selenium	700 µg / L to 7,000 µg / L
Silver	NNS to 7,000 µg / L
Simazine	NNS to 7,000 µg / L
Styrene	28,000 µg / L to 280,000 µg / L
2,3,7,8-Tetrachlorodibenzo-p-dioxin	NNS to 1.40 µg / L
1,1,2,2-Tetrachloroethane	NNS to 56,000 µg / L
Tetrachloroethylene	1400 µg / L to 14,000 µg / L
Thallium	12 µg / L to 112 µg / L
Toluene	28,000 µg / L to 280,000 µg / L
Toxaphene	NNS to 1,400 µg / L
1,2,4-Trichlorobenzene	1400 µg / L to 14,000 µg / L
1,1,1-Trichloroethane	NNS to 200 µg / L
1,1,2-Trichloroethane	560 µg / L to 5,600 µg / L
Trichloroethylene	NNS to 280,000 µg / L
2,4,6-Trichlorophenol	NNS to 127.3 µg / L
2-(2,4,5-Trichlorophenoxy) propionic acid	1120 µg / L to 11,200 µg / L
2,4,5-Trichlorophenoxyacetic acid	NNS to 14,000 µg / L
Vinyl chloride	NNS to 4,200 µg / L
Xylenes	280,000 µg / L to 2,800,000 µg / L
Zinc	42,000 µg / L to 420,000 µg / L

Add Hardness / pH tables to Appendix A

Currently, there are 4 categories of aquatic life designated uses: aquatic and wildlife (cold water fishery), aquatic and wildlife (warm water fishery), aquatic and wildlife (effluent dependent water) and aquatic and wildlife (ephemeral water). Each aquatic life subcategory has water quality criteria to protect organisms from acute and chronic toxicity. The toxicity of several pollutants is dependent upon either the hardness or the pH of the surface water. For example, the toxicity of cadmium, chromium III, copper, lead, nickel, silver, and zinc is a function of the hardness of a surface water. The toxicity of pentachlorophenol is dependent on the pH of a surface water. The current water quality criteria for these pollutants are expressed as mathematical equations with hardness or pH variables. These mathematical equations are “user-unfriendly.” It is difficult for the average person to understand what the water quality standards are for hardness and pH-dependent pollutants when the standards are expressed as mathematical equations. ADEQ proposes to add tables to Appendix A for these parameters and calculate the acute and chronic criteria for a range of hardness and pH values. ADEQ does not propose to revise the acute and chronic toxicity criteria for hardness and pH-dependent pollutants. Rather, ADEQ proposes to revise how the water quality criteria for those parameters are presented in the surface water quality standards rules. ADEQ hopes that tables with a range of hardness and pH values and corresponding acute and chronic aquatic life criteria will be more understandable than the mathematical equations that are in the current rules.

Update A&W criteria using recent toxicity data

ADEQ has adopted numeric water quality criteria to protect 4 aquatic life designated uses. They are: aquatic and wildlife-cold water (A&Wc), aquatic and wildlife-warm water (A&Ww), aquatic and wildlife - effluent dependent water (A&Wedw), and aquatic and wildlife - ephemeral water (A&We). Two methods were used to calculate acute and chronic criteria for the A&W designated uses where toxicity data was available. Both methods are described in detail in “Rationale for the Development of Toxic Pollutant Criteria to Protect Aquatic and Wildlife Designated Uses,” Arizona Department of Environmental Quality, Water Quality Assessment Unit, March 13, 1996.

The first method is the method that EPA uses to derive national water quality criteria for freshwater under §304(a) of the Clean Water Act (the “Guidelines procedure”). The Guidelines procedure is a statistically-based methodology designed to protect 95% of all species nationwide. The Guidelines procedure requires a minimum dataset of eight toxicity tests representing a variety of aquatic vertebrates and invertebrates. Species mean and genus mean values are calculated from the results of the toxicity tests and final acute or chronic values are calculated from the 4 lowest genus mean values.

The second method that ADEQ used to derive A&W criteria is called the LC₅₀ method. The LC₅₀ method was used to calculate criteria when insufficient data existed to apply the Guidelines procedure. Even with this methodology, ADEQ could not develop criteria for all of the priority pollutants because of a lack of toxicity data. Two primary factors distinguish the LC₅₀ method from the Guidelines procedure: 1) there are no minimum data set requirements for the LC₅₀ method, and 2) the LC₅₀ method is not a statistically-based method designed to provide aquatic life protection at a specific confidence level.

Toxicity data and bioconcentration factors used to calculate the criteria were obtained from EPA criteria documents. Toxicity data to derive criteria are intended to be representative of the respective aquatic life designated use. For example, the dataset used to calculate criteria for the A&Wc designated use includes cold water species (e.g. trout). The dataset used to calculate criteria for the A&Ww designated use excludes cold water species. For the A&Wedw designated use, only toxicity data corresponding to species that have been found in EDWs were used to calculate criteria. Best professional judgment was used to compile a species list for ephemeral waters because of the lack of toxicity data on organisms inhabiting ephemeral waters in Arizona.

The use of different methodologies and modified datasets to derive criteria for the A&W designated uses sometimes resulted in the calculation of anomalous criteria. For example, ADEQ expected that water quality criteria derived using the Guidelines method would be the most stringent because they were designed to protect 95% of all species nationally. However, in some cases, criteria derived for other aquatic life designated uses were more stringent. Consequently, ADEQ developed the following 5-step decision guideline for the A&W criteria to address anomalies:

- A&W criteria are developed for each A&W designated use using the best available science and data.
- A&W criteria will not be designed to protect more than 95% of species nationally (except where site-specific criteria are proposed).
- If an A&Ww criterion is more stringent than an A&Wc criterion, the proposed A&Ww criterion will default to the proposed A&Wc criterion.

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- If an A&Wedw criterion is more stringent than an A&Ww criterion, the proposed A&Wedw criterion will default to the A&Ww criterion
- If an A&We criterion is more stringent than an A&Ww criterion, the proposed A&We criterion shall default to the A&Ww criterion.

The application of these decision guidelines results in A&Wc criteria that are always more stringent or equal to A&Ww criteria and A&Ww criteria that are always more stringent or equal to A&Wedw or A&We criteria.

ADEQ updated the aquatic and wildlife criteria for the pollutants listed in Appendix B using toxicity data from ECOTOX, an ecotoxicology database maintained by the U. S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory. ADEQ proposes to adopt new aquatic life criteria for the following pollutants:

Alachlor:	A&Wc (acute), A&Ww (acute), and A&Wedw (acute): 2,500 µg / L A&Wc (chronic), A&Ww (chronic) and A&W (edw)(chronic): 170 µg / L
Carbofuran:	A&Wc (acute), A&Ww (acute), and A&Wedw (acute): 650 µg / L A&Wc (chronic), A&Ww (chronic) and A&W (edw)(chronic): 50 µg / L
Chlorobenzene:	A&Wedw (acute): NNS to 3,800 µg / L A&Wedw (chronic): NNS to 260 µg / L
Styrene:	A&Wc (acute), A&Ww (acute) and A&Wedw (acute): 5600 µg / L A&Wc (chronic), A&Ww (chronic) and A&Wedw (chronic): 370 µg / L

ADEQ proposes to revise the current aquatic life criteria and adopt more stringent criteria for the following pollutants and subcategories of aquatic life use:

Benzene:	A&Wedw (acute): 11,000 µg / L to 8,800 µg / L A&Wedw (chronic) 700 µg / L to 560 µg / L
Chlorobenzene:	A&Wc (acute), A&Ww (acute): 9,800 µg / L to 3,800 µg / L A&Wc (chronic), A&Ww (chronic): 620 µg / L to 260 µg / L
2,4-Dinitrotoluene:	A&Wc (acute), A&Ww (acute), and A&Wedw (acute): 15,000 µg / L to 14,000 µg / L A&Wc (chronic), A&Ww (chronic) and A&W (edw)(chronic): 970 µg / L to 860 µg / L
Napthalene:	A&Ww (acute), A&Wedw (acute): 3,300 µg / L to 3,200 µg / L A&Ww (chronic), A&Wedw (chronic): 600 µg / L to 580 µg / L

Numeric ammonia criteria for aquatic life protection

Ammonia is a pollutant that is routinely found in wastewater treatment plant effluents, landfill leachates, and agricultural runoff from fields where commercial fertilizers and animal manure are applied. The control of the discharge of ammonia is necessary to protect aquatic life in Arizona's surface waters because ammonia has known toxic effects to aquatic life [See 1999 Update of Ambient Water Quality Criteria for Ammonia, U.S. Environmental Protection Agency, Office of Water, EPA-822-R-99-014, December, 1999].

In 1985, EPA published the first Ambient Water Quality Criteria for Ammonia document. This national criteria document contained ammonia criteria concentrations for the protection of freshwater aquatic life. The Criterion Maximum Concentration (CMC) applied to acute exposures, and the Criterion Continuous Concentration (CCC) applied to chronic or long-term exposures. The CMC and CCC varied according to pH and the type of fishery involved. EPA amended this criteria document in 1992.

In 1998, EPA published another update to the national criteria document for ammonia. The updated criteria document assessed the aquatic toxicity data for ammonia in freshwater and presented revised criteria to protect aquatic life. The revised ammonia criteria superseded EPA's previous criteria guidance for ammonia published in d 1992. The 1998 criteria guidance for ammonia revised the acute and chronic ammonia criteria and the chronic averaging period. The acute and chronic criteria were expressed in terms of milligrams of ammonia nitrogen per liter and they varied with pH. The ammonia criteria for acute toxicity differed depending on whether salmonid species were present or not. For the chronic ammonia criteria, no substantial differences between salmonid and non-salmonid sensitivity were apparent and the chronic criteria did not vary according to the species of fish present (i.e., presence or absence of salmonids).

In 1999, EPA updated the national water quality criteria for ammonia again. EPA's 1999 Update reflects recent research and data on ammonia toxicity collected since 1984. The 1999 Update includes several revisions of elements of the previous criteria documents, including revisions to take into account newer data, better models, and improved statistical methods to address the temperature and pH-dependence of ammonia toxicity in freshwater. EPA's recommended criteria are expressed as concentrations of total ammonia nitrogen (in mg / L). The recommended acute criteria for ammonia are dependent on pH and the presence or absence of salmonids. The acute criteria values vary as a continuous function of pH and they are not dependent on temperature. EPA's recommended chronic criteria are dependent on pH and temperature. However, the recommended chronic criteria are not species-sensitive. The chronic criteria do not vary depending on the presence or absence of salmonids. However, at lower temperatures, the chronic criteria are dependent on the presence or absence of early life stages of fish. EPA's recommended chronic criteria gradually increase as temperature decreases. The chronic criteria are more stringent at temperatures below 15° C when early life stages of fish are expected to be present. EPA's 1999 Update differs from the 1998 Update primarily in the handling of the temperature-dependency of the chronic toxicity criteria for ammonia.

EPA recommends that states adopt numeric ammonia criteria applicable at all times of the year for all surface waters designated for the protection of aquatic life. Numeric ammonia criteria may be adopted based on EPA's national criteria recommendations for ammonia, national criteria modified to reflect site-specific conditions, or other scientifically defensible methods. EPA takes the position that numeric ammonia criteria can be adopted by states because EPA has published §304(a) criteria for ammonia. There is a voluminous amount of data on ammonia toxicity to support the development of numeric criteria. EPA has stated in the Federal Register that the adoption of numeric criteria for ammonia is a high priority for triennial reviews of water quality standards that will occur in FY 2001 through FY 2003. EPA has stated its intention to federally promulgate numeric ammonia criteria where a state does not amend its water quality standards to include water quality criteria for ammonia that ensure protection of aquatic life designated uses.

Arizona currently has acute criteria for ammonia for the A&Wc and A&W designated uses in the surface water quality standards rules, but these acute criteria are based upon earlier versions of EPA's national criteria guidance. As noted above, EPA's previous ammonia criteria recommendations have been superseded by the 1999 Update. Therefore, in the proposed rule, ADEQ proposes to revise the numeric criteria for total ammonia to be consistent with EPA's recommendations in the 1999 Update.

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ADEQ proposes the following acute criteria for total ammonia (in mg N / L):

Acute Criteria for Total Ammonia (in mg N / L)		
pH	A&Wc	A&Ww
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
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
	0.885	1.32

ADEQ currently does not have numeric criteria for chronic ammonia toxicity in the surface water quality standard rules. ADEQ proposes to adopt the temperature and pH-dependent chronic values recommended by EPA for waters with early life stages of fish present as the state's criteria to prevent chronic ammonia toxicity. ADEQ proposes that the numeric criteria be applied to surface waters in Arizona with the A&Wc, and A&Ww designated uses.

Chronic Criteria for Total Ammonia in mg N / L for A&Wc and A&Ww Designated Uses										
pH	Temperature, °C									
	0	14	16	18	20	22	24	26	28	30

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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

Proposed repeal of the chronic A&We criteria

Water quality criteria to protect aquatic life contain two expressions of allowable magnitude. Acute criteria are established to protect against short-term effects and chronic criteria are established to protect against long-term effects of pollutants. In general, EPA derives chronic criteria from longer term toxicity tests (often greater than 28-days) that measure survival, growth, and reproduction of test organisms. The term of these toxicity tests is often greater than the length of time that ephemeral waters typically flow in Arizona.

The surface water quality standard rules currently include an aquatic and wildlife designated use that applies to ephemeral waters (A&We). The A&We designated use has both acute and chronic criteria to protect aquatic life and wildlife. However, ADEQ has determined that chronic A&We criteria are unnecessary to protect the designated use. ADEQ defines an ephemeral water as a surface water that flows only in direct response to precipitation and that is at all times above the water table. Surface waters that flow continuously for 30 days or more are considered to be intermittent waters that are protected by A&Wc or A&Ww designated uses. The A&Wc and A&Ww designated uses have both acute and chronic criteria. ADEQ has determined that chronic criteria are unnecessary for ephemeral waters because they flow for less than 30 days at a time and the duration of exposure of organisms to pollutants is short-term. ADEQ therefore proposes to repeal the current chronic criteria for the A&We designated use.

Revised sulfide standard for lakes.

Arizona's lakes, reservoirs, and ponds are surface waters that are commonly referred to as lentic (still or slow water). They are the opposite of a lotic system, such as a stream or river, where water is continually moving and circulating. In most surface waters, the addition of oxygen occurs at the water's surface. In a stream or river, oxygen is circulated throughout the water column because the water is continually moving. In lakes and reservoirs, differences in chemical, physical, and biological characteristics can cause layers of water to form on top of one another. This process is called stratification. The layers of water can become fixed for long periods of time, preventing the circulation of oxygen into the deeper layers. This can cause the deeper areas of a lake or reservoir to become oxygen deficient or anaerobic. In anaerobic conditions, sulfide levels can sometimes be quite high. At times, the sulfide concentrations in the hypolimnion, or deepest layer of a lake or reservoir, can violate the current standards established to protect aquatic life designated uses. ADEQ proposes to clarify that the current sulfide standards apply only to water samples taken from the epilimnion, or the upper layer of a lake or reservoir.

The triennial review process

§303(c)(1) of the Clean Water Act requires that a state shall, from time to time, but at least once every 3 years, hold public hearings to review state-adopted water quality standards and, as appropriate, modify and adopt standards. The beginning of each triennial review cycle is measured from the date of the transmittal letter that ADEQ sends to EPA informing EPA that revised or new standards have been adopted and are being submitted to EPA for their review. Arizona's water quality standards rules were last revised on April 26, 1996.

ADEQ identifies new water quality standards or revisions that need to be made to existing water quality standards rules in each triennial review. Recommendations for changes to existing water quality standards or suggestions for adoption of new standards come from many sources, including ADEQ and EPA Region IX staff, water quality advisory groups, persons in the regulated community, and citizens who are interested in surface water quality issues.

Public participation

A required element of the triennial review process is public participation. The active and meaningful involvement of persons who are or may be affected by water quality standards decisions is critical to the successful implementation of ADEQ's water quality standards program. At a minimum, §303(c) of the Clean Water Act requires that states hold one public hearing to review and discuss revisions to the water quality standards. In recent triennial reviews, ADEQ has gone far beyond the minimum public participation requirements prescribed in the Clean Water Act. ADEQ has sponsored a variety of public participation activities. ADEQ has held public meetings, roundtable discussions, and met with advisory groups to discuss water quality standards issues and proposed revisions to the water quality standards rules.

Prior to the publication of the Notice of Proposed Rulemaking, ADEQ conducted a number of informal public participation activities to identify water quality standards issues, solicit comments and suggestions for additions or revisions to the current water quality standards rules, and to discuss proposed unique waters nominations. ADEQ has discussed water quality standards issues at several monthly meetings of the Water Quality Policy Coordinating Committee, a water quality advisory group. In late January and early February, 1999, ADEQ held a series of 3 public meetings in Flagstaff, Phoenix, and Tucson to take informal public comments on water quality standards issues that should be considered in this triennial review. In 1999 and in 2000, ADEQ staff held a series of informal public meetings in Cascabel, Flagstaff, Alpine, Phoenix, and Globe to solicit comments on nominations of surface waters for classification as unique waters.

ADEQ published a preliminary draft set of revisions to the surface water quality standards rules and conducted a series of public meetings to take public comments on surface water quality issues raised in the preliminary draft. ADEQ considered the comments that were made on the preliminary draft rules. The general framework for public participation in Arizona's triennial review process is notice and comment rulemaking. The process includes both informal and formal rulemaking activities. The publication of this Notice of Proposed Rulemaking initiates the formal rulemaking process. ADEQ will hold oral proceedings to take formal public comments on the proposed rules. Persons can submit oral and written comments at the oral proceedings or submit written comments to ADEQ. After the close of the public comment period, ADEQ will consider all of the public comments received, make appropriate revisions to the proposed rules, and develop a formal responsiveness summary. Within 120 days of the close of the public comment period, ADEQ must either adopt the revisions to the surface water quality standards rules or terminate the rulemaking. ADEQ must prepare a Notice of Final Rulemaking which includes the revised rules, explanation of the changes to the rules, agency responses to comments, and an economic impact statement. The Notice of Final Rulemaking is then submitted to the Governor's Regulatory Review Council [GRRRC]. The GRRRC reviews the agency's Notice of Final Rulemaking at a public meeting and either approves or disapproves the rules. If the rules are approved, they are filed with the Office of the Secretary of State and they become effective. The GRRRC may disapprove the rules and return them to the agency for supplemental rulemaking activities.

EPA Review of State-Adopted Water Quality Standards

After final administrative action at the state level, ADEQ will submit the water quality standards revisions and an Attorney General certification that the revisions were duly adopted according to state law to EPA Region IX for review and approval or disapproval. 40 CFR §131.20(c) of the federal water quality standards regulation requires ADEQ to submit the standards package to EPA within 30 days of final state action (i.e., the date of filing with the Office of the Secretary of State). EPA reviews and either approves or disapproves the standards based on whether they meet the requirements of the Clean Water Act and the federal water quality standards regulations.

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In general, three outcomes are possible: 1) EPA approval, in whole or in part, of the state's water quality standards, 2) EPA disapproval, in whole or in part, of the submitted standards, or 3) EPA conditional approval. EPA must, within 60 days of submittal by the state, notify ADEQ by letter of any approvals of the state's water quality standards. If EPA determines that the state-adopted water quality standards do not meet the requirements of the Clean Water Act, EPA Region IX must disapprove the standards within 90 days. A letter of disapproval must state why the standards do not meet the requirements of the Act and specify the revisions that must be made to obtain full EPA approval. State-adopted water quality standards do not become effective for Clean Water Act purposes until they are approved by EPA [*See Alaska Clean Water Alliance v. Clark*, No. C96-1762R (W.D. Wash. July 8, 1997)]

6. A reference to any study that the agency proposes to rely on in its evaluation of or justification for the proposed rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:

None

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:

ADEQ must prepare a preliminary summary of the economic, small business, and consumer impact because it is a required element of a Notice of Proposed Rulemaking [*See* R1-1-502]. Later in the formal rulemaking process, ADEQ will have to prepare a final economic impact statement to accompany the final rules that ADEQ submits to the Governor's Regulatory Review Council.

ADEQ solicits comments on the economic impact of the rules from persons who will be directly affected by, bear the costs of, or directly benefit from proposed surface water quality standards rules. ADEQ is interested in receiving comments that relate to the following:

- a. The probable costs and benefits to ADEQ and other agencies that will be directly affected by the implementation and enforcement of the surface water quality standards rules.
- b. The probable costs and benefits to a political subdivision of Arizona that will be directly affected by the implementation and enforcement of the surface water quality standards rules.
- c. The probable costs and benefits to businesses directly affected by the proposed rulemaking, including any anticipated effects on revenues or payroll expenditures of employers who may be affected by the rules.
- d. The probable impacts on private and public employment.
- e. The probable impacts on small businesses, including probable compliance costs and whether there are any methods that ADEQ may use to reduce the impact on small businesses (e.g., less costly compliance requirements, schedules of compliance, and exemptions).
- f. The probable effects on state revenues.
- g. The probable costs and benefits to private persons and consumers who are directly affected by the rulemaking.
- h. Descriptions of any less intrusive or less costly alternative methods of achieving the purpose of the proposed rulemaking.

ADEQ is particularly interested in obtaining public comments on the economic impact of the proposed adoption of numeric criteria to protect aquatic life from chronic toxicity of ammonia, the proposed repeal of the nutrient waiver provision, and the proposal of 10 surface waters for unique waters classification.

In general, ADEQ does not believe that the proposed revisions to the surface water quality standards rules will have a significant economic, small business, or consumer impact. Many of the proposed revisions to the water quality standards are editorial in nature or clarifications of the current rules that will have no economic impact.

The proposed revisions to the rules may affect political subdivisions of Arizona that operate wastewater treatment plants that discharge to surface waters regulated by surface water quality standards. In particular, the adoption of stringent water quality criteria to control chronic ammonia toxicity in surface waters with the A&Wc and A&Ww designated uses may result in new water quality-based discharge limitations in NPDES permits for wastewater treatment plants that discharge to perennial streams with these designated uses. Wastewater treatment plants and other point source dischargers may be required to upgrade treatment to control ammonia toxicity in discharges to surface waters. ADEQ received no comments on preliminary draft ammonia standards and cannot predict the extent of the economic impact to political subdivisions from the proposed rule change (if any).

Similarly, the repeal of the nutrient waiver rule may affect approximately 10 operators who currently operate wastewater treatment plants under nutrient waivers. Again, the proposed revision may require these wastewater treatment plants to upgrade wastewater treatment processes to control the discharge of nutrients to surface waters. If the nutrient waiver rule is repealed, ADEQ may establish schedules of compliance to provide time for the wastewater treatment plants to come into compliance with applicable nutrient standards. In the alternative, operators of the affected wastewater treatment plants may apply for a variance.

The proposed revisions to the surface water quality standards are expected to have no impact on private and public employment.

The proposal to classify 10 surface waters as unique waters may affect some persons (e.g., ranchers who have grazing allotments in the watersheds where the proposed unique waters are located). In general, the proposed unique waters are located in remote areas of the state, in National Forests, or in wilderness areas. A unique waters classification may result in changes in forest management plans for the Apache Sitgreaves National Forest and new requirements for best management practices. Unique waters classifications may affect the uses of public lands within the proposed unique waters watersheds such as grazing, timber harvesting, and mining activity. ADEQ is interested in receiving comments from persons who have economic interests who may be affected by the proposed unique waters classifications.

The proposed revisions to the surface water quality standards rules are anticipated to have little or no economic impact on other state agencies, other than ADEQ. The revisions to the rules are expected to have no effect on state revenues.

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

Name: Mr. Steven Pawlowski
Address: Arizona Department of Environmental Quality
3033 North Central Avenue
Phoenix, Arizona 85012-2809
Telephone: (602) 207-4219
Fax: (602) 207-4528
E-mail: sep@ev.state.az.us

10. The date, time and place of public meetings to discuss the proposed rules:

Date: June 6, 2001
Time: 7:00 p.m.
Location: Arizona Department of Environmental Quality
Room 1709
3033 North Central Avenue
Phoenix, Arizona
Date: June 12, 2001
Time: 7:00 p.m. to 10:00 p.m.
Location: Arizona Corporation Commission
Hearing Room 222
Arizona State Office Complex
400 West Congress Street
Tucson, Arizona

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Date: **June 14, 2001**

Time: 7:00 p.m. to 10:00 p.m.

Location: City of Flagstaff City Council Chambers
211 West Aspen Avenue
Flagstaff, Arizona

Date: **June 26, 2001**

Time: 7:00 p.m. to 10:00 p.m.

Location: Gila County Board of Supervisors Meeting Room
1400 East Ash Street
Globe, Arizona

Date: **June 27, 2001**

Time: 7:00 p.m. to 10:00 p.m.

Location: Town of Springerville City Hall
418 Main Street
Springerville, Arizona

The public comment period on the proposed rules will close on July 20, 2001. Written comments may be submitted by letter or e-mail to Mr. Steve Pawlowski at the address stated in paragraphs #4 and #9 of this preamble. Written comment letters must be postmarked by July 20, 2001.

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

Not applicable

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

In R18-11-110(B) ADEQ incorporates by reference the "1999 Review, Water Quality Standards for Salinity, Colorado River System," Colorado River Basin Salinity Control Forum (June, 1999).

13. The full text of the rules can be found in Part 2 of 2 (page 1916):