NOTICES OF FINAL RULEMAKING

The Administrative Procedure Act requires the publication of the final rules of the state's agencies. Final rules are those which have appeared in the *Register* 1st as proposed rules and have been through the formal rulemaking process including approval by the Governor's Regulatory Review Council. The Secretary of State shall publish the notice along with the Preamble and the full text in the next available issue of the *Arizona Administrative Register* after the final rules have been submitted for filing and publication.

NOTICE OF FINAL RULEMAKING

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

CHAPTER 2. CORPORATION COMMISSION FIXED UTILITIES

PREAMBLE

1. **Sections Affected** / **Rulemaking Action**

Sections Affected	Rulemaking Action
Article 12	New Article
R14-2-1201	New Section
R14-2-1202	New Section
R14-2-1203	New Section
R14-2-1204	New Section
R14-2-1205	New Section
R14-2-1206	New Section
R14-2-1207	New Section
R14-2-1208	New Section
R14-2-1209	New Section
R14-2-1210	New Section
R14-2-1211	New Section
R14-2-1212	New Section
R14-2-1213	New Section
R14-2-1214	New Section
R14-2-1215	New Section
R14-2-1216	New Section
R14-2-1217	New Section

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

   Authorizing statutes: A.R.S. §§ 40-202, 40-203, 40-204, 40-250, 40-321, 40-322, 40-361, 40-365, 40-367, 40-424, 40-425, and the Arizona Constitution, Article 15 §§ 1, 2, 3, 4, 6, 16, and 19.

   Implementing statutes: A.R.S. §§ 40-202, 40-203, 40-204, 40-250, 40-321, 40-322, 40-361, 40-365, 40-367, 40-424, 40-425, and the Arizona Constitution, Article 15 §§ 1, 2, 3, 4, 6, 16, and 19.

3. **The effective date of the rules:**

   April 26, 1996

4. **A list of all previous notices appearing in the Register addressing the final rule:**

   Notice of Proposed Rulemaking:
   2 A.A.R. 672, January 12,1996

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

   Name: Paul Bullis, Chief Counsel, Legal Division

   Address: Corporation Commission
   1200 West Washington
   Phoenix, Arizona 85007

   Telephone: (602)542-3402

   Fax (602)542-4870

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

   The proposed rules establish the Arizona Universal Service Fund (AUSF) in compliance with applicable rules for competitive telecommunications services set forth in R14-2-1101 through R14-2-1115, in particular R14-2-1113. The AUSF in the funding mech-

anism through which surcharges are collected from consumers of telecommunications services and support is paid to eligible providers of basic local telephone exchange service in areas where the cost of providing the service exceeds the rate authorized to be charged for the service.

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 summary of the economic, small business, and consumer impact:**
   Rules for competitive telecommunications services require the establishment of a Universal Service Fund to assure the continued availability of basic telephone service at reasonable rates. In compliance, the proposed rules establish the Arizona Universal Service Fund (AUSF) to collect and disburse money to maintain universal telephone service. The proposed rule will affect providers and users of telecommunications services in Arizona.

9. **A description of the changes between the proposed rules, including supplemental notices, and final rules (if applicable):**

R14-2-1201. Definitions

The term "Conversion Factor" in R14-2-1201(9) was modified by the addition of the words "for both wireless and wireline customers" after the word "trunks"; and, the definition of the term "Interconnecting Trunk" in Rule 1201(10) modified by the addition of the words "or to a wireline customer of such local switched access provider" after the word "services" in the 4th line and by the similar addition of the words "or wireline customer" after the word "services" in line 5.

R14-2-1202. Calculation of AUSF Support

The following language was added to the end of R14-2-1202(B): "For any request for AUSF support by a small local exchange carrier filed more than 3 years after the effective date of this Article, the AUSF support area shall be the geographic areas as determined by the Commission.:

R14-2-1204. Funding of the AUSF

The language "Category 1 or Category 2" in the 1st sentence of R14-2-1204(B)(3))(b) was deleted and replaced with the following language: "Category 1, Category 2, or both Category 1 and Category 2,".

R14-2-1205. Calculation of Surcharges

The following new subsection (E) was added: "Recipients of lifeline or other low-income support shall be exempt from paying a Category 1 surcharge".

R14-2-1206. Implementation

The following new subsection (G) was added: "Defined area, study area, geographic area, and support area mean that same area during the 1st 3 years of the effective date of this Article. After the 1st 3 years, they will still have the same meaning unless otherwise ordered by the Commission."

R14-2-1209(B). Procedures for Handling AUSF Rate Charges

The following language was inserted after the word "costs" in R14-2-1209(B): "as well as any corrections and true-ups".

R14-2-1210. Statement of Participation of All Telecommunication Service Providers in the AUSF.

The following language was inserted after the word "termination" in subsection (A): "after written notice from the Administrator".

R14-2-1212. Interim Administrator

The following language was inserted between the words "party" and "shall" in the last sentence of R14-2-1212: "selected through the competitive bid process".

10. **A summary of the principal comments and the agency response to them:**

R14-2-1201 through R14-2-1217

Issue: MCI Telecommunications Corporation ("MCI") supported the rules. However, MCI requested the Commission open a rulemaking proceeding to address the resale of telecommunications services.

In response, staff indicated a new docket to address the resale of telecommunications would be initiated.

Evaluation: MCI's concerns can and should be addressed in a new docket.

Resolution: No change is necessary.

R14-2-1201. Definitions

Issue: Southwest Wireless, L.P., dba Cellular One ("Cellular One") argued that the proposed rules creates a disparity between wireline telephone customers utilizing interconnecting trunks and cellular customers of the local exchange carrier ("LEC") utilizing precisely the same mode of interconnection. As a result, Cellular One recommended the definition of the term "Conversion Factor" in Rule 1201(9) be modified by the addition of the words "for both wireless and wireline" before the word "interconnecting" and the substitution of the word "the" for "a" in that same line of the definition; and, the definition of the term "Interconnect-

ing Trunk" in R12-4-1201(10) be modified by the addition of the words "or to a wireline customer of such local switched access provider" after the word "services" in the 4th line and by the similar addition of the words "or wireline customer" after the word "services" in line 5.

Similarly, GST Tucson Lightwave, Inc. ("GST") was concerned that the surcharge be equitable on both Private Branch Exchange ("PBX") and Centrex customers. According to GST, there was no mention of PBX-type trunk connections in the definition of "Interconnecting Trunk". GST proposed that the Commission assess trunk charges for both Centrex and PBX customers on a "trunk equivalent" basis.

In response, staff agreed with Cellular One's comments and proposed solution. staff further opined that the Cellular One solution would resolve GST's concerns.

Resolution: Adoption of Cellular One's proposed language in R12-4-1201(9) and R12-4-1201(10) will clarify the intent of those Rules.

Issue: GST requested clarification of the proposed Rule's underlying methodology relating to Total Service Long Run Incremental Cost ("TSLRIC") of the incumbent provider.

Staff disagreed with GST's proposal. According to staff, the definition of TSLRIC is essentially identical to the definition utilized in the existing Competitive Telecommunications rules, R14-2-1101 et seq.

Evaluation: The definition of TSLRIC is identical to the existing definition contained in R14-2-1102(17). Consistent with the Competitive Telecommunications rules, no additional language is necessary.

Resolution: No change is needed.

Issue: MFS Communications Company, Inc. ("MFS") complained that the proposed rules would provide LECs with excessive, windfall subsidies. According to MFS, the proposed rules ignore the contributions generated by related services that are not included under the definition of "basic local exchange telephone service" as defined in R14-2-1201(6).

In response, U S West Communications, Inc. ("U.S. West") indicated that an LEC must demonstrate to the Commission its need for support from the AUSF. Further, US West indicated that the Commission would not allow an LEC to reap a windfall.

In response, staff indicated that contributions generated by related services could be considered in a rate case.

Evaluation: The concerns of MFS can be taken into consideration as part of the rate case of the respective LEC.

Resolution: No changes are necessary.

R14-2-1202. Calculation of AUSF Support

Issue: GST requested clarification on the differences between "support areas" and "geographic areas" as set forth in R14-2-1202.

In response, staff indicated these areas were the same for small local exchange carriers during the 1st 3 years of these rules. After that time period, the Commission may adopt a "support area" that is different from the "geographic area".

Evaluation: New language should be added to R14-2-1202 in order to clarify the intent.

Resolution: The following language should be added to the end of R14-2-1202(B): "For any request for AUSF support by a small local exchange carrier filed more than 3 years after the effective date of this Article, the AUSF support area shall be the geographic areas as determined by the Commission."

R14-2-1203. Request for AUSF Support

Issue: According to the Association of Arizona Exchange Carriers ("AAEC"), the Federal Communications Commission ("FCC") established the Federal Universal Service Fund ("FUSF") with the objective of providing quality telephone service at reasonable rates to every geographic region of the country. AAEC indicated that applicants for support from the FUSF must submit data to the National Exchange Carrier Association ("NECA") to demonstrate that the average loop costs of the applicant's distribution plant exceed by 115% the national "benchmark" set by NECA. AAEC recommended that similar procedures be set up to administer the AUSF. According to AAEC, it appears the only way to qualify for support in Arizona is through a full-blown rate case. AAEC asserted that the time and expense to qualify for AUSF support could easily outweigh the support received from the fund. Further, AAEC asserted that to receive support from the AUSF does not constitute a rate increase.

In response, AT&T Communications of the Mountain States, Inc. ("AT&T") recommended the AAEC arguments be rejected. AT&T indicated that the AUSF funds come from ratepayers who should not have their rates raised without a clear demonstration by AAEC members of their need for a subsidy.

US West and staff both disagreed with AAEC's statement that the purpose of the AUSF was to replace revenues lost to competition. According to U.S. West and staff, the purpose of the AUSF is to assure the continued availability of basic telephone service at reasonable rates by providing support to eligible providers.

Evaluation: While the support payments may not constitute a rate increase for those receiving the funds, ratepayers for other telephone service providers will have to pay a subsidy. We concur with AT&T that there needs to be a clear demonstration for the need of any subsidy.

Resolution: No change is necessary.

R14-2-1204. Funding of the AUSF

Issue: MFS criticized the proposal set forth in R14-2-1204(B) whereby the AUSF will be funded 50% by "Category 1" service (local service) and 50% by "Category 2" service (toll service). According to MFS, the 50/50 allocation between local and toll services is arbitrary and may unbalance the competitive market place. MFS urged the Commission to adopt a competitively-neutral funding mechanism.

In response, AT&T indicated that the 50/50 funding has been in place in Arizona for 6 years and has worked well. According to AT&T, a proven approach should not be abandoned for a vague and untested scheme proposed by party.

According to staff, the 3-year review period set forth in R14-2-1216 will allow the Commission to identify and address any inequities. staff did agree that R14-2-1204(B)(3) should be amended to clarify that telecommunications service providers can choose to be both a Category 1 and Category 2 service provider.

Evaluation: At this time there is insufficient information to know if the 50/50 approach is the best funding allocation. However, absent evidence to support another approach as being better, the 50/50 allocation method is a reasonable approach that has worked successfully in the past. staff should continue to monitor the allocation method for possible future amendments. R14-2-1204(B)(3) should be amended to clarify that a provider may choose to provide both Category 1 and Category 2 services.

Resolution: The 1st sentence of R14-2-1204(B)(3)(b) should be amended to include language that a provider may choose to provide both Category 1 and Category 2 services.

R14-2-1205. Calculation of Surcharges

Issue: GST recommended the rules be amended to exempt lifeline end users from the requirement to pay AUSF surcharges.

Staff concurred with this proposal.

Resolution: In order to clarify the intent of R14-2-1205, the following new subsection (E) should be added: "E. Recipients of lifeline or other low-income support shall be exempt from paying a Category 1 surcharge."

R14-2-1206. Implementation

Issue: GST proposed that R14-2-1206(B) and (C) be changed to allow Category 1 providers to report de minimis surcharge revenues on a quarterly basis instead of the proposed monthly basis.

In response, staff indicated it did not oppose the GST proposal. However, staff opined that it would not be able to identify an appropriate threshold level for streamlined reporting until it has some experience with the process.

Evaluation: The GST proposal may be a good idea, however, there is insufficient information at this time to know what, if any, changes should be made to the reporting process. This matter should continue to be monitored by staff for a possible amendment in the future.

Resolution: No change is necessary at this time.

R14-2-1206(E) and (F)

Issue: GST recommended the term "defined area" in R14-2-1206(E) be clarified so that it will not be misconstrued as a "study area" which is synonymous with the incumbent's entire service area.

In response, staff indicated that there was no need for additional clarification. At a public comment hearing, staff indicated that "defined area", "study area", "geographic area", and "support area" meant the same area during the 1st 3 years of the effective date of this Article. After the 1st 3 years, they will still have the same meaning unless otherwise ordered by the Commission.

According to AAEC, R14-2-1206(F) does not permit competitive providers of basic local exchange service to qualify for AUSF support until the Commission staff has completed the review required by R14-2-1216(A). AAEC requested R14-2-1206(F) to be amended so that even after the review process, no competitive local access provider should be authorized to receive support from the AUSF unless: (i) the incumbent LEC is receiving support from the AUSF; and (ii) the competitive provider agrees to provide local service to any customer requesting service who is located within any of the incumbent LEC's certificated territories in Arizona (i.e., the incumbent LEC's AUSF support area).

According to staff, a modification is not necessary since R14-2-1206(F) permits small and intermediate LECs to receive AUSF support today, while competitors would not be eligible for such support until after a 3-year review period. Further, staff believes R14-2-1206(F) properly limits eligibility for AUSF support to competitors that are willing to provide basic local exchange service to all customers in the geographic study area as defined in the rules. staff indicated the AAEC proposal would create a mismatch between the support area and service area.

Resolution: Adoption of the following new subsection (G) will clarify the intent of the rules:

G. Defined area, study area, geographic area, and support area mean the same area during the 1st 3 years of the effective date of this Article. After the 1st 3 years, they will still have the same meaning unless otherwise ordered by the Commission.

R14-2-1209. Procedures for Handling AUSF Rate Changes

Issue: GST expressed concerns that R14-2-1213 does not provide for annual corrections or true-ups.

Staff responded that R14-2-1209 contemplates corrections and true-ups, although not mentioned explicitly. Accordingly, staff did not believe a modification to the rules was necessary but had no objection to such a modification.

Evaluation: Although corrections and true-ups are implicitly included in R14-2-1209, additional clarifying language to R14-2-1209 will help minimize future disagreements.

Resolution: The following clarifying language should be added to R14-2-1209(B) after the word "costs": "as well as any corrections and true-ups".

R14-2-1210. Statement of Participation of All Telecommunications Service Providers in the AUSF

Issue: R14-2-1210(A) requires every existing telecommunications service provider to file a letter with the AUSF Administrator within 30 days of the effective date of the rules, acknowledging the providers obligation to pay AUSF surcharges. The penalty for failure to provide the letter is disconnection from the public switched network. MFS recommends that the R14-2-1210 be amended to require the Administrator to provide written notice to all telecommunications service providers of the adoption of the rules and the requirement to file a letter of acknowledgment.

Staff disagreed with the MFS recommendation. According to staff, the rulemaking procedures provide adequate notice to the telecommunications providers.

Evaluation: We concur with staff. While we believe it is implicit that a provider would not be disconnected without reasonable notice, we will add that requirement to R14-2-1210 for clarification purposes.

Resolution: For clarification purposes, we will add the words "after written notice from the Administrator" after the word "termination" in R14-2-1210(A).

R14-2-1212. Interim Administrator

Issue: GST was concerned that U.S. West was designated as the AUSF interim administrator. GST urged the Commission appoint an independent, 3rd party such as the NECA to serve as interim administrator.

AAEC proposed that the Commission utilize a competitive bidding process to select an independent administrator for the AUSF.

In response, U.S. West also urged the Commission to move quickly in the selection of a 3rd party administrator.

Although not spelled out in the rules, staff indicated the intent was to select an independent administrator of the AUSF through the competitive bid process. Further, staff responded that it could see no reason to replace U.S. West on an interim basis.

Evaluation: Additional language should be added to R14-2-1212 to clarify the selection process for a neutral Administrator. In the meantime, U S West should remain as the interim Administrator. US West is currently serving as the Administrator of the existing universal service fund and should continue to do so until a neutral party can be selected by the Commission through the bid process.

Resolution: The following language should be inserted between the works "party" and "shall" in the last sentence of R14-2-1212: "selected through the competitive bid process". This language will help clarify the intent of the rule.

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:
Not applicable.

13. Was this rule previously adopted as an emergency rule?
No.

14. The full text of the rules follows:

TITLE 14: PUBLIC SERVICE CORPORATIONS, CORPORATIONS AND ASSOCIATIONS, SECURITIES REGULATION

CHAPTER 2. CORPORATION COMMISSION
FIXED UTILITIES

ARTICLE 12. ARIZONA UNIVERSAL SERVICE FUND

Section
R14-2-1201. Definitions
R14-2-1202. Calculation of AUSF Support
R14-2-1203. Request for AUSF Support
R14-2-1204. Funding of the AUSF
R14-2-1205. Calculation of Surcharges
R14-2-1206. Implementation
R14-2-1207. Calculation of Monthly Payments and the Associated Collections
R14-2-1208. Monthly AUSF Disbursements
R14-2-1209. Procedures for Handling AUSF Rate Changes

R14-2-1210. Statement of Participation of all Telecommunications Service Providers in the AUSF
R14-2-1211. Duties and Responsibilities of the AUSF Administrator
R14-2-1212. Interim Administrator
R14-2-1213. Guidelines for Auditing the AUSF
R14-2-1214. Enforcement of Collection of Delinquent AUSF Amounts
R14-2-1215. AUSF Annual Report
R14-2-1216. Review Process
R14-2-1217. Supersession of Existing USF Mechanism

ARTICLE 12. ARIZONA UNIVERSAL SERVICE FUND

R14-2-1201. Definitions

In this Article, unless the context otherwise requires, the following definitions shall apply:

1. "Administrator" is the person designated pursuant to R14-2-1212 to administer the AUSF and perform the functions required by this Article.
2. "Arizona Corporation Commission" or "Commission." The regulatory agency of the state of Arizona having jurisdiction over public service corporations operating in Arizona.
3. "Arizona Universal Service Fund" or "AUSF" is the funding mechanism established by this Article through which surcharges are collected and support paid in accordance with this Article.
4. "AUSF Support" is the amount of money, calculated pursuant to this Article, which a provider of basic local telephone exchange service is eligible to receive from the AUSF pursuant to this Article.
5. "AUSF Support Area" is the geographic area for which a local exchange carrier's eligibility to receive AUSF support is calculated.
6. "Basic local exchange telephone service" is telephone service that provides the following features:
   a. Access to 1-party residential service with a voice grade line;
   b. Access to touchtone capabilities;
   c. Access to an interexchange carrier;
   d. Access to emergency services, including but not limited to emergency 911;
   e. Access to directory assistance service;
   f. Access to operator service;
   g. Access to a white page or similar directory listing; and
   h. Access to telephone relay systems for the hearing and speech impaired.
7. "Benchmark rates" for a telecommunications services provider are those rates approved by the Commission for that provider for basic local exchange telephone service, plus the Customer Access Line Charge approved by the Federal Communications Commission.
8. "Commercial Mobile Radio Service" is any radio communication service carried on between mobile stations or receivers and land stations, or by mobile stations communicating among themselves, that is provided for profit and that makes available to the public service that is connected to the public switched network.
9. "Conversion Factor" is a multiplier that is used to convert a quantity of interconnecting trunks for both wireless and wireline customers into equivalent access lines, for the sole purpose of developing Category 1 surcharges. The value of the Conversion Factor shall be 10 until completion of the review provided for in R14-2-1216.
10. "Interconnecting Trunk" is a 1-way or 2-way voice grade or equivalent voice grade switched message transmission channel furnished by a local switched access provider to a provider of wireless services or to a wireline customer of such local switched access provider to interconnect the provider of wireless services or wireline customer to the public switched network.
11. "Intermediate Local Exchange Carriers" are incumbent providers of basic local exchange telephone service with more than 20,000 access lines but fewer than 200,000 access lines in Arizona.
12. "Large Local Exchange Carriers" are incumbent providers of basic local exchange telephone service serving 200,000 or more access lines in Arizona.
13. "Small Local Exchange Carriers" are incumbent providers of basic local exchange telephone service with 20,000 or fewer access lines in Arizona.
14. "Total Service Long Run Incremental Cost" is the total additional cost incurred by a telecommunications company to produce the entire quantity of a service, given that the telecommunications company already provides all of its other services. Total Service Long Run Incremental Cost is based on the least cost, most efficient technology that is capable of being implemented at the time the decision to provide the service is made.
15. "U.S. Census Blocks" are geographic areas defined by the U.S. Department of Commerce. The areas, which define the way in which census data is aggregated, generally contain between 250 and 550 housing units

R14-2-1202. Calculation of AUSF Support

A. The amount of AUSF support to which a provider of basic local exchange telephone service is eligible for a given AUSF support area shall be based upon the difference between the benchmark rates for basic local exchange telephone service provided by the carrier, and the appropriate cost to provide basic local exchange telephone service as determined by the Commission, net of any universal service support from federal sources.

B. For a small local exchange carrier, the AUSF support area shall include all exchanges served by the local exchange carrier in Arizona. The appropriate cost of providing basic local exchange telephone service for purposes of determining AUSF support for a small local exchange carrier shall be the embedded cost of the incumbent provider. For any request for AUSF support by a small local exchange carrier filed more than 3 years after the effective date of this Article, the AUSF support area shall be the geographic areas as determined by the Commission.

C. For an intermediate local exchange carrier, the AUSF support area shall be either all exchanges in Arizona served by that carrier, or such other support area as may be approved by the Commission. The appropriate cost of providing basic local exchange telephone service for purposes of determining AUSF support for an intermediate local exchange carrier shall be the embedded cost of the incumbent provider. For any request for AUSF support by an intermediate local exchange carrier filed more than 3 years after the effective date of this Article, the AUSF support area shall be geographic areas as determined by the Commission, and the appropriate cost of providing basic local exchange telephone service for purposes of determining AUSF support shall be the Total Service Long Run Incremental Cost of the incumbent provider. In the event that the FCC adopts a somewhat different forward-looking costing methodology and/or a different geographic study/support area for the Federal universal service fund program, a local exchange carrier may request a waiver from this rule in order to utilize the same cost study methodology and/or geographic study areas in

both jurisdictions.

D. For a large local exchange carrier, the AUSF support area shall be U.S. census block groups, and the appropriate cost of providing basic local exchange telephone service for purposes of determining AUSF support shall be the Total Service Long Run Incremental Cost. In the event that the FCC adopts a somewhat different forward-looking costing methodology and/or a different geographic study/support area for the Federal universal service fund program, a local exchange carrier may request a waiver from this rule in order to utilize the same cost study methodology and/or geographic study areas in both jurisdictions. Any request for AUSF support by a large local exchange carrier shall include a Total Service Long Run Incremental Cost study, or cost study based on FCC adopted methodology, of basic local exchange service. The cost study shall be developed and presented in a manner that identifies the cost for the individual support areas for which AUSF funding is being requested.

R14-2-1203. Request for AUSF Support

A provider of basic local exchange telephone service may request that the Commission authorize AUSF support with a filing under R14-2-103 or other method as the Commission may prescribe, and upon compliance with all applicable rules set forth in R14-2-1101 through R14-2-1115. A request for AUSF support shall include a statement describing the need for such funding. The Commission shall determine the appropriate cost of providing basic local exchange service for each AUSF support area for which AUSF support is requested and shall calculate in accordance with R14-2-1202 the amount of AUSF support, if any, to which the applicant is entitled.

R14-2-1204. Funding of the AUSF

A. The AUSF shall be funded in accordance with this Article by all telecommunications service providers that interconnect to the public switched network. Within 30 days of the effective date of this Article, and thereafter on or before October 1 of each year, each telecommunications provider shall provide to the Administrator a list of all other telecommunications providers that interconnect to its facilities or network.

B. The AUSF shall be funded equally by toll and local customers of the providers of telecommunications services, and shall be assessed in the following manner:

1. Category 1 - Providers of basic local exchange service, as discussed in R14-2-1204(B)(1)(a), and other service providers as required under R14-2-1204(B)(1)(a)(i) or permitted under R14-2-1204(B)(3)(b), shall be considered providers of Category 1 service.
   a. One-half of the AUSF funding requirement will be collected through Category 1 service providers. Category 1 AUSF assessment will be based upon access lines and interconnecting trunks, and assessed by providers of local switched access as either an access line or interconnecting trunk surcharge. The "per access line" surcharge to be in place during a given year will be calculated by the Administrator using the total number of access lines and equivalent access lines deriving from interconnecting trunks that were in service for all Category 1 service providers on October 1 of the previous year. Access lines shall include business and residence lines, public access lines, and other identifiable access lines. All wireless providers including but not limited to paging and other Commercial Mobile Radio Service providers, that interconnect to the public switched network will contribute to the AUSF under the requirements of Category 1. The number of interconnecting trunks obtained from the local access provider by the wireless provider shall be utilized in conjunction with a Conversion Factor to determine AUSF support from such wireless provider by means of a surcharge on such interconnecting trunks. A wireless provider that fails to contribute to the AUSF as required by this Article shall be subject to termination of its interconnection arrangements pursuant to R14-2-1214(C).
   b. On or before November 1 of each year, each Category 1 local switched access service provider shall provide to the Administrator the number of access lines and number of interconnecting trunks that were in service on October 1 of that year. The Administrator will use these numbers together with the Conversion Factor in calculating the per access line surcharge and per interconnecting trunk surcharge for the following year. The Administrator will multiply the total number of interconnecting trunks by the Conversion Factor to obtain an equivalent number of access lines for the purpose of calculating the surcharges.
2. Category 2 - Providers of intrastate toll service, or other service providers as permitted under R14-2-1204(B)(3), shall be considered providers of Category 2 service and shall be assessed AUSF charges as follows:
   a. One-half of the AUSF funding requirement will be collected through Category 2 service providers. The Category 2 AUSF assessment will be based on total Arizona intrastate toll revenue, and assessed as a percent of revenue. The percent of revenue assessment to be in place during a given year will be calculated by the Administrator using the annual Arizona intrastate revenue for all Category 2 service providers for the previous year.
   b. On or before November 1 of each year, each Category 2 service provider shall report to the Administrator the total Arizona intrastate revenue collected between August 1 of the current year and August 1 of the previous year. The Administrator will use this revenue so reported to calculate the AUSF assessment rate for the following year.
3. New telecommunications service providers.
   a. Telecommunications providers that begin providing basic local exchange service after the effective date of this Article shall be assessed AUSF charges pursuant to R14-2-1204(B)(1). Telecommunications providers that begin providing toll service after the effective date of this Article shall be assessed AUSF charges pursuant to R14-2-1204(B)(2).
   b. All other telecommunications service providers that interconnect to the public switched network and begin providing telecommunications service after the effective date of this Article, shall choose to be considered either a Category 1, Category 2, or both Category 1 and Category 2 service provider. Such election shall be made in writing to the Administrator within 30 days of beginning to provide telecommunications service in Arizona, with a copy to the Director of Utilities. Written concurrence of the Director of Utilities must be received by the Administrator for such selection to be effective. Such selection will be irrevocable for a period of at least 3 years.
4. A telecommunications provider that provides both Category 1 and Category 2 services shall be assessed AUSF

charges pursuant to both R14-2-1204(B)(1) and R14-2-1204(B)(2).

R14-2-1205. Calculation of Surcharges

A. The Administrator will calculate the total AUSF support due all local exchange carriers who have been granted AUSF support by the Commission. Administrative costs and audit fees will be added to this amount. The amount of any excess funds in the AUSF will then be subtracted to determine the total funding requirement. The funding requirements from Category 1 and Category 2 service providers will then be calculated. One half of the funding will be obtained from Category 1 providers through surcharges applied to access lines and interconnecting trunks in service. The other half will be obtained from Category 2 providers through surcharges on intrastate toll revenues.

B. For the purpose of determining the surcharges, the Administrator will develop growth factors to apply to the total reported access lines and toll revenues. Such growth factors will be calculated at 1/2 of the estimated annual percentage growth in access lines and in toll revenues.

C. Category 1 Surcharge. One-half of the total annual AUSF support approved by the Commission for all eligible recipients will be obtained from Category 1 service providers. A monthly per access line surcharge and a monthly per interconnecting trunk surcharge required to obtain this funding will be calculated as follows:
   1. Adding together the number of access lines and equivalent access lines for all Category 1 service providers, adjusted by the growth factor;
   2. Dividing the total annual AUSF support approved by the Commission for all eligible recipients by 2 to obtain the portion of AUSF support required from Category 1 service providers;
   3. Dividing the amount of Category 1 AUSF support calculated in subsection (C)(2) by the sum of access lines calculated in subsection 1 to yield the per access line surcharge;
   4. Dividing the per access line surcharge calculated in subsection (C)(3) by 12 to determine the monthly access line assessment;
   5. Multiplying the surcharge obtained in subsection (C)(4) by the Conversion Factor to determine the monthly interconnecting trunk surcharge.

D. Category 2 Surcharge. One-half of the total annual AUSF support approved by the Commission for all eligible recipients will be obtained from Category 2 service providers. A percent of revenue surcharge required to obtain this funding will be calculated as follows:
   1. Totaling the annual intrastate toll revenues of all Category 2 service providers, adjusted by the growth factor;
   2. Dividing the total AUSF support approved by the Commission for all eligible recipients by 2 to obtain the portion of AUSF support required from Category 2 service providers;
   3. Dividing the amount of Category 2 AUSF support requirement calculated in subsection (D)(2) by the total annual intrastate toll revenues calculated in subsection (D)(1) to arrive at a percentage of revenue surcharge.

E. Recipients of lifeline or other low-income support shall be exempt from paying a Category 1 surcharge.

R14-2-1206. Implementation

A. Any provider of telecommunications service may file either an AUSF tariff or price list, if appropriate, establishing a flow-through mechanism to collect the surcharge approved by the Commission and calculated by the Administrator.

B. On or before the 20th day of each month, each Category 1 service provider responsible for collecting AUSF surcharges shall remit to the Administrator the AUSF surcharge, including any surcharge on wireless providers, collected by that provider during the preceding month. The Category 1 provider shall submit such documentation of AUSF revenues from the AUSF surcharge as may be required by the Administrator.

C. On or before the 20th day of each month, each Category 2 service provider responsible for collecting AUSF surcharges shall remit to the Administrator the AUSF surcharge collected by that provider during the 3rd preceding month. The Category 2 provider shall submit such documentation of AUSF revenues from the AUSF surcharge as may be required by the Administrator.

D. Eligible recipients of AUSF support are:
   1. Providers of telecommunications service engaged in providing basic local exchange telephone service in Arizona which have obtained a Commission order authorizing payments from the AUSF; and
   2. Providers that become entitled to AUSF support based upon the provisions of R14-2-1206(E).

E. If the Commission approves AUSF support to a provider of telecommunications service for a defined area, such AUSF support shall also be available to competitive providers of basic local exchange service in the same defined area that are contributing to the AUSF, and that are willing to provide service to all customers in the specific AUSF support area as defined by the Commission. The AUSF support to which the competitive provider is eligible shall be calculated on a per-customer basis, at the same level at which the incumbent provider of telecommunications service receives AUSF support, and shall not result in an increase in the total AUSF support available for the specific census block groups or study area. If basic exchange service is provided through the resale of another carrier's local loop facilities, AUSF support will only be available to the retail service provider if AUSF support is not included in the wholesale price for the resold local service. This Section shall not apply to small local exchange carriers nor to the universal service support being received by any telecommunications service provider as of the effective date of this Article.

F. For small local exchange carriers and for any basic local exchange telephone service provider receiving universal service support as of the effective date of this Article, the AUSF support shall not be available to competitive providers of basic local exchange service prior to completion of the review provided for in R14-2-1216. Following completion of the review, AUSF support provided to small and intermediate local exchange carriers shall be available to all competitive providers of basic local exchange service in the same defined area that are contributing to AUSF, and that are willing to provide service to all customers in the specific geographic study area as defined by the Commission, unless otherwise ordered by the Commission.

G. Defined area, study area, geographic area, and support area mean the same area during the 1st 3 years of the effective date of this Article. After the 1st 3 years, they will still have the same meaning unless otherwise ordered by the Commission.

R14-2-1207. Calculation of Monthly Payments and the Associated Collections

A. For the monthly Category 1 AUSF payment, each provider of local switched access shall remit to the Administrator an amount equal to the number of access lines in service on the 1st day of the month, times the monthly surcharge per access line plus the number of interconnecting trunks in service on the 1st day of the month, times the monthly interconnecting

trunk surcharge.

B. The monthly AUSF payment that each Category 2 provider shall remit to the Administrator is an amount equal to its monthly intrastate toll revenue times the monthly surcharge percentage.

C. Payments must be received by the Administrator by the 20th day of each month. If the payment amount is greater than $10,000, then it shall be wire transferred to the Administrator.

D. The Administrator shall enter into an appropriate non-disclosure agreement with each telecommunications service provider to assure that information necessary to allocate AUSF funding obligations and to calculate surcharges is reported, maintained, and used in a manner that will protect the confidentiality of company specific data. The Administrator shall not use confidential data for any purpose other than administering the AUSF.

R14-2-1208. Monthly AUSF Disbursements

A. AUSF disbursement shall be made 30 days following the date of AUSF collections.

B. The Administrator shall not make AUSF support payments to a provider of telecommunications service until the Administrator has received a copy of a Commission decision authorizing the provider to receive such support.

R14-2-1209. Procedures for Handling AUSF Rate Changes

A. Category 1 and Category 2 AUSF surcharges shall be revised when the Commission authorizes new or revised AUSF payments to any provider of telecommunications service. The Administrator shall calculate the new AUSF flow-through surcharges in accordance with this Article, which surcharges shall become effective upon the Commission's approval of the new or revised AUSF payments.

B. An annual calculation to revise AUSF flow-through surcharges shall be made by the Administrator on December 1 of each year with an effective date the following January 1. The flow-through surcharges shall be calculated so that the total AUSF funding will equal the AUSF revenue requirements, plus administrative costs as well as any corrections and true-ups. No later than December 1 of each year, the Administrator shall provide notice to the Commission and all telecommunication service providers who pay into the AUSF of the flow-through surcharge rates for the following calendar year.

R14-2-1210. Statement of Participation of All Telecommunications Service Providers in the AUSF

A. Within 30 days of the effective date of this Article, each telecommunications service provider shall provide a letter to the Administrator acknowledging that provider's obligation under this Article to pay AUSF surcharges. Failure to provide such a letter shall be grounds for termination after written notice from the Administrator of the provider's interconnection with the public switched network.

B. Any telecommunications service provider which begins providing telecommunications service after the effective date of this Article shall, within 30 days of beginning to provide intrastate service in Arizona, provide a letter to the Administrator acknowledging that provider's obligation under this Article to make monthly payments for the local and/or toll portion, as appropriate, of the AUSF contribution in accordance with this Article. Failure to provide such a letter shall be grounds for denying to the provider interconnection with the public switched network.

R14-2-1211. Duties and Responsibilities of the AUSF Administrator

The Administrator shall:

1. Develop, obtain, and, on or before December 15 of each year, file with the Commission such information and documentation as the Administrator deems necessary for the establishment and calculation of the Category 1 and Category 2 surcharges for the succeeding year. Such a filing shall also be made each time the Commission authorizes a change in the AUSF funding requirement.
2. Monitor the AUSF payments of all telecommunications providers.
3. Oversee the billing of AUSF surcharges.
4. Prepare the necessary forms to be used in reporting the AUSF collections and disbursements and maintain monthly records.
5. Coordinate the collection and disbursement of AUSF monies in accordance with this Article.
6. Prepare an annual report that provides a detailed accounting of the AUSF collections and disbursements and that identifies the annual cost of administration. The report shall be filed with the Commission on or before April 15 of each year.
7. Monitor procedures for auditing the AUSF collections and disbursements. The audit function shall be performed by an independent outside auditor.

R14-2-1212. Interim Administrator

US WEST Communications, Inc., will serve as interim Administrator of the AUSF and will perform the functions detailed herein that are required of the Administrator for a transition period until a private, neutral 3rd party is appointed by the Commission to serve as Administrator of the AUSF. A neutral 3rd party selected through the competitive bid process shall be appointed no later than July 1, 1997.

R14-2-1213. Guidelines for Auditing the AUSF.

A. The AUSF records covering both collections and disbursements shall be audited at the end of the 1st year following the designation of a 3rd party administrator. The AUSF records will then be audited at least once every other year in the subsequent years of operations.

B. The records shall be examined for accuracy and the existence of effective internal controls to ensure that the AUSF is being administered appropriately and properly.

C. An independent external auditor selected by the Commission shall be utilized to provide an unbiased audit opinion concerning the AUSF administration procedures and controls.

D. Any costs for conducting audits will be deducted from the revenues of the AUSF prior to disbursement of funds.

R14-2-1214. Enforcement of Collection of Delinquent AUSF Amounts

A. The Administrator shall issue past due notices to each provider of telecommunications service that is 15 days or more delinquent in submitting its AUSF payments to the Administrator. A copy of this notice shall be provided to the Commission.

B. AUSF support payments shall be withheld from any provider of telecommunications service that is delinquent in submitting its AUSF payments to the Administrator. Each provider of telecommunications service will be fully liable for any accrued interest owing on its AUSF contributions that remain unpaid for 30 days. Such delinquent AUSF payments will begin accruing interest at the rate of and 1/2% per month beginning with the 31st day until such amount is paid in full along with all accrued interest.

C. The local switched access service provider shall promptly notify the Commission and the Administrator of the identity of any wireless provider which fails or refuses to pay its AUSF surcharge. Such notice shall also be directed to the wireless provider. If the wireless provider has not paid the amount due

within 30 days of such notice, the interconnection provider shall terminate the wireless provider's interconnection until the full amount together with all accrued interest, is paid in full (unless the payment is in bonafide dispute and the wireless carrier has paid the undisputed amount).

D. Failure by a telecommunications service provider to comply with the provisions of this Article may result in sanctions as determined by the Commission.

R14-2-1215. AUSF Annual Report

A. On or before April 1 of each year, the Administrator shall file with the Commission an annual report which shall summarize the preceding year activity and contain the following:
   1. A statement of AUSF collections and disbursements.
   2. A record of the total cost of administration of the AUSF.
   3. Audit reports from the audits conducted during the year.

B. A copy of the annual report shall be provided to each provider of telecommunications service who contributes to the AUSF.

R14-2-1216. Review process

A. Not later than 3 years from the effective date of this Article, the Commission staff shall initiate a comprehensive review of this Article and shall provide the Commission with recommendations regarding any necessary changes to the Article. Any interested party may also make such recommendations. The Commission shall consider these recommendations in such proceeding as the Commission deems appropriate.

B. The costs used to calculate AUSF funding levels for a given provider or AUSF support area shall be reviewed by the Commission at least every 3 years following the effective date for any authorized AUSF support for the provider or study area. The Commission may reduce the authorized funding level and require that the AUSF surcharge be recalculated on the basis of this review.

R14-2-1217. Supersession of Existing USF Mechanism

The universal service funding mechanism initially approved by the Commission in Decision No. 56639 (September 22, 1989) is superseded by this Article, except that any calculation, contribution or collection of, or entitlement to, universal service fund support approved by the Commission prior to the adoption of this Article shall remain in effect until otherwise ordered by the Commission or until the application of this Article leads to a different result.

NOTICE OF FINAL RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 11. DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY STANDARDS FOR SURFACE WATERS

PREAMBLE

1. Sections Affected	Rulemaking Action
Chapter 11	Amend
R18-11-101	Amend
R18-11-102	Amend
R18-11-103	Repeal
R18-11-104	Amend
R18-11-105	New Section
R18-11-106	New Section
R18-11-107	Amend
R18-11-108	Amend
R18-11-109	Amend
R18-11-111	Amend
R18-11-112	Amend
R18-11-113	Amend
R18-11-114	Amend
R18-11-115	Amend
R18-11-117	Amend
R18-11-118	Amend
R18-11-120	Amend
R18-11-121	Amend
R18-11-122	New Section
R18-11-123	New Section
Appendix A	Repeal
Appendix A	New Section
Appendix B	Repeal
Appendix B	New Section
Appendix C	Repeal
Article 2	Repeal
R18-11-202	Repeal
R18-11-203	Repeal
R18-11-205	Repeal

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. § 49-221

   Implementing statute: A.R.S. § 49-222

3. **The effective date of the rules:**

   April 23, 1996

4. **A list of all previous notices appearing in the Register addressing the final rule:**

   Notice of Rulemaking Docket Opening:
   1 A.A.R. 895, June 30, 1995

   Notice of Proposed Rulemaking:
   1 A.A.R. 2811, December 29, 1995

5. **The names and addresses of agency personnel with whom persons may communicate regarding the rulemaking:**

   Name: Richard Meyerhoff

   Address: Department of Environmental Quality
   3033 North Central Avenue
   Phoenix, Arizona 85012

   Telephone: (602) 207-4539

   Fax: (602) 207-4528

   Name: Steven Pawlowski

   Address: Department of Environmental Quality
   3033 North Central Avenue
   Phoenix, Arizona 85012

   Telephone: (602) 207-2227

   Fax: (602) 207-2251

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

   The adopted rules establish water quality standards for surface waters in Arizona. Water quality standards define the water quality goals for a surface water by designating the use or uses to be made of the surface water and setting water quality criteria that are adequate to protect and maintain water quality for those uses. The state establishes water quality standards to protect the public health and welfare, enhance the quality of the water, and to serve the purposes of the Clean Water Act.

   Under both federal and state law, water quality standards are established to achieve, wherever attainable, a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife and which provides for recreation in and on the water. The state is required to take into consideration, the use and value of surface waters as public water supplies and for agricultural, industrial, recreational, and other purposes, including navigation, when it establishes water quality standards [See §101(a)(2) and §303(c) of the Clean Water Act and A.R.S. § 49-222(A)].

   Under A.R.S. § 49-221(C), The Arizona Department of Environmental Quality [ADEQ] also must consider the following factors in setting water quality standards for surface waters:

   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 of the Clean Water Act, Safe Drinking Water Act, and their implementing regulations.
   4. The degree to which standards for 1 category of water may cause violations of standards for other, hydrologically connected water categories [e.g., water quality standards for surface waters and aquifer water quality standards].
   5. Guidelines, action levels, or numeric criteria adopted or recommended by the U.S. Environmental Protection Agency or any other federal agency.
   6. Any unique physical, biological, or chemical properties of surface waters.

   ADEQ initiated this rulemaking to comply with the requirements of the Clean Water Act. Section 303(c)(1) of the Clean Water Act requires that states review their surface water quality standards at least once every 3 years and revise them where it is appropriate to do so. Under A.R.S. § 49-202(A), ADEQ is the designated state agency for all purposes of the Clean Water Act. Therefore, ADEQ is responsible for conducting the triennial review of the state's water quality standards. The last triennial review of the Arizona's water quality standards was completed with the adoption of revisions to the state-adopted water quality standards rules effective February 18, 1992.

   State-adopted water quality standards are subject to approval or disapproval by the U.S. Environmental Protection Agency [EPA].

EPA is required to review the state-adopted water quality standards and make a determination whether the standards meet the requirements of the Clean Water Act and federal water quality standards regulations. EPA's review involves a determination of whether ADEQ has adopted use designations for surface waters in Arizona that are consistent with the requirements of the Clean Water Act; whether ADEQ has adopted water quality criteria that are sufficient to protect water quality for those designated uses; whether the state-adopted water quality standards include an antidegradation policy that is consistent with federal requirements; whether ADEQ complied with procedural requirements for adopting or revising water quality standards; and whether the state-adopted water quality standards are based upon appropriate technical or scientific analyses.

EPA can either approve, conditionally approve, or disapprove state-adopted water quality standards in whole or in part. If the Regional Administrator of EPA Region IX determines that revisions to state-adopted water quality standards are not consistent with the requirements of the Clean Water Act and its implementing regulations, then the Regional Administrator is required to disapprove the standards and provide written notice to the state specifying what changes must be made to the water quality standards in order for them to be approved. If a state fails to make the required changes within 90 days of notification, then EPA is required to promptly promulgate federal water quality standards for the state.

In the last triennial review of Arizona's water quality standards, the Regional Administrator of U.S. EPA Region IX reviewed the state-adopted water quality standards and subsequently issued 4 letters indicating EPA approvals and disapprovals. On March 2, 1992, EPA approved Arizona's numeric water quality standards for toxic pollutants. On May 26, 1992, EPA approved the state-adopted nutrient standards for the Lower Colorado River. On July 6, 1992, EPA approved the salinity standards for the Colorado River. On September 9, 1993, EPA disapproved certain portions of the state-adopted water quality standards. These disapprovals included the following:

1. Disapproval of the exclusion from water quality standards for mining-related impoundments;
2. Disapproval of the lack of the fish consumption designated use for certain surface waters in Arizona;
3. Disapproval of the lack of biomonitoring procedures for implementation of the narrative toxics standard at R18-11-108(A)(5);
4. Disapproval of the lack of implementation procedures for the narrative nutrient standard at R18-11-108(A)(6);
5. Disapproval of the practical quantitation levels prescribed in Appendix C.

On November 8, 1993, Arizona informed EPA by letter that the state would defer its response to the above disapprovals until after EPA completed a required consultation with the U.S Fish & Wildlife Service [USFWS] on Arizona's water quality standards under §7 of the Endangered Species Act and took final action on the remainder of the water quality standards. §7 of the Endangered Species Act requires that EPA consult with the USFWS to determine whether EPA's action on the approval or disapproval of Arizona's water quality standards would be likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitat.

On April 29, 1994, EPA completed its review, approving the remaining portions of the state-adopted water quality standards, with 1 exception. EPA disapproved Arizona's numeric water quality standards for mercury that had been established to protect aquatic life and wildlife. This additional disapproval was based upon a biological opinion issued by the USFWS. In the USFWS biological opinion, the USFWS stated that Arizona's water quality standards for mercury jeopardized endangered and threatened species because the state had failed to adequately consider the bioaccumulative effects of mercury on predatory birds and fish when the numeric water quality criteria were developed.

The Director of ADEQ responded to the EPA disapprovals by letter dated July 6, 1994. The response indicated that Arizona would propose required revisions to the state-adopted water quality standards rules in the current triennial review. ADEQ noted in the response to EPA that revisions to Arizona's water quality standards could not be accomplished within 90 days of EPA's final notice of disapproval because rulemaking was required to make the revisions. This rulemaking includes the necessary revisions in response to the EPA disapprovals. Each of the necessary revisions are discussed in the summary of the changes to the rules below.

The triennial review of the state-adopted water quality standards rules is not limited to issues related to specific EPA disapprovals. ADEQ may identify other necessary revisions to designated uses, water quality criteria, antidegradation policy, or other general policies. This rulemaking also includes revisions to the water quality standards rules that are unrelated to EPA disapprovals. All of these revisions are discussed in the following summary.

Summary of Revisions to the Water Quality Standards Rules

"Navigable Water" v. "Surface Water"

Both the Clean Water Act and state law require the state to adopt water quality standards for "navigable waters." The general authorizing statute for this rulemaking states at A.R.S. § 49-221(A) that the Director of the Department of Environmental Quality "shall adopt, by rule, water quality standards for all navigable waters...." The specific authorizing statute for this rulemaking,

A.R.S. § 49-222, also refers to water quality standards for "navigable waters."

The use of the term, "navigable waters," is consistent with the terminology used in §303(c) of the Clean Water Act. For example, §303(c)(2) of the Clean Water Act provides that a water quality standard shall consist of "the designated uses *of the navigable waters involved* and the water quality criteria for such waters based upon their uses." The term, "navigable waters," is a legal term of art. It is specifically defined in the Clean Water Act as "the waters of the United States, including the territorial seas" [See §502(7) of the Clean Water Act]. Arizona statute also defines "navigable waters" as the "waters of the United States" [See A.R.S.

§ 49-201(17)].

The phrase, "waters of the United States," also has a specific legal definition. "Waters of the United States" is defined in the federal regulations which govern the National Pollutant Discharge Elimination System permit program. 40 CFR 122.2 defines "waters of the United States" as follows:

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, 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 subsections (a) through (d) of this definition;

f. The territorial sea;

g. "Wetlands" adjacent to waters [other than waters that are themselves wetlands) identified in subsections (a) through (f) of this definition

The currently effective water quality standards rules include definitions of "navigable waters" and "waters of the United States." "Navigable waters" is defined as the "waters of the United States" [See R18-11-101(32). The text of the definition of "waters of the United States" is essentially the same as that found in the federal regulations [Compare R18-11-101(45) to 40 CFR 122.2].

In the last triennial review of the water quality standards rules, Arizona revised the rules to consistently use the term, "navigable water." This change was made to make the terminology of the rules consistent with the terminology used in the Clean Water Act and to clarify that the water quality standards rules were adopted by the state pursuant to A.R.S. §§ 49-221(A) and 49-222. Unfortunately, the use of the term, "navigable water," created confusion in the regulated community. Many people do not understand that the term, "navigable water," is a legal term of art with a specific legal definition under both the Clean Water Act and Arizona law. Many persons understandably interpret "navigable water" to mean only those water bodies that are navigable-in-fact. The use of the term, "navigable water," led to confusion over what surface waters in Arizona are governed by state-adopted water quality standards. To avoid this confusion and to make the water quality standards rules more understandable, ADEQ eliminated all references to "navigable waters" in the rules. ADEQ replaced "navigable waters" with the term, "surface waters." ADEQ believes that "surface waters" more accurately describes the water bodies that are subject to water quality standards. ADEQ also believes that the term, "surface waters," will be less subject to misinterpretation by the regulated community.

The use of the term, "surface water" should not be interpreted as a substantive change in the scope of the water quality standards rules. The terms "surface water," "navigable water," and "water of the United States" are synonymous. The definition of "surface water" at R18-11-101(41) makes clear that a "surface water" is a "water of the United States." A comparison of the definition of "surface water" in the adopted rule with the federal definition of "water of the United States" at 40 CFR 122.2 will show that the 2 definitions are essentially the same.

Scope of the Proposed Water Quality Standards Rules

ADEQ amended R18-11-102 to clarify that water quality standards apply to surface waters but do not apply to waste treatment systems or to certain man-made surface impoundments used in mining. The waste treatment system and mining impoundments exclusions from water quality standards were established by the state in the last triennial review of the water quality standards rules [See R18-11-103(1) and (2)]. In this rulemaking, ADEQ revised the language of both of the currently effective exclusions. ADEQ also consolidated the currently effective applicability and exclusion Sections into 1 Section.

The Waste Treatment System Exclusion

The state-adopted water quality standards apply to surface waters [i.e, to "navigable waters" or to "waters of the United States"]. The water quality standards do not apply to waste treatment systems. This exclusion from water quality standards is stated at R18-11-102(B)(1). Under the adopted rule, water quality standards do not apply to waste treatment systems, including the impoundments, ponds, lagoons, and constructed wetlands that are a part of such waste treatment systems.

The source of the waste treatment system exclusion is the federal definition of "waters of the United States." 40 CFR 122.2 provides, in relevant part:

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA [other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States [such as a disposal area in wetlands] nor resulted from the impoundment of waters of the United States [See Note 1 of this Section].

Under this subsection, a manmade pond or lagoon that is part of a waste treatment system and which is located outside of "a water of the United States" is not a "water of the United States" and is therefore not subject to water quality standards. Also, a manmade pond or lagoon that is part of a wastewater treatment system which is not created by impounding a "water of the United States" is not a "water of the United States" is not subject to water quality standards. Any pond or lagoon that is a part of a wastewater treatment system which complies with these location restrictions is not considered to be a "water of the United States" and water quality standards do not apply.

In 1980, the U.S. Environmental Protection Agency suspended until further notice the language in the definition of "water of the United States" which prescribes the location restrictions for ponds and lagoons that are part of wastewater treatment systems [See 45 FR 48620 (July 21, 1980)]. Note 1 to the federal definition of "waters of the United States" states that EPA suspended the 2nd sentence in the waste treatment system exclusion which provides:

> This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States [such as a disposal area in wetlands] nor resulted from the impoundment of waters of the United States."

EPA's suspension of the location restriction language quoted above has never been lifted. ADEQ interprets the suspension of this language by EPA to mean that the waste treatment system exclusion in the federal definition of "waters of the United States" is not conditioned by any location restrictions. In ADEQ's view, the suspended language which imposes location restrictions on manmade ponds and lagoons that are part of wastewater treatment systems is without legal effect. The only operative part of the waste treatment system exclusion in the federal definition of "waters of the United States" is the 1st sentence which states that: "[w]aste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA [other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States."

The waste treatment system exclusion is found in the currently effective water quality standards rules at R18-11-103(1). However, R18-11-103(1) includes the language that has been suspended by EPA. In the adopted rules, ADEQ revised the state-adopted waste treatment system exclusion to make it consistent with the currently effective federal definition of "waters of the United States."

The repeal of the 2nd sentence from the waste treatment system exclusion will broaden the exclusion and provide more regulatory flexibility. For example, the repeal of the 2nd sentence will remove an existing legal barrier to the use of constructed wetlands in the channels of dry watercourses for wastewater treatment. Under the currently effective exclusion, the construction of a wetlands for wastewater treatment in the channel of a dry watercourse is effectively precluded because water quality standards have to be met at the point of discharge into the constructed wetlands. The requirement to comply with water quality standards at the point of discharge into a constructed wetlands defeats the wetland's intended purpose of providing treatment. If the location restriction language in the wastewater treatment system exclusion is repealed, then it is possible to construct a wetlands in the channel of a dry watercourse for the purpose of wastewater treatment. Water quality standards would not have to be met at the point of discharge into such a constructed wetlands. Rather, compliance with water quality standards would be determined at the point of discharge from the constructed wetlands. The repeal of the location restriction language from the wastewater treatment system exclusion will allow ADEQ to consider in-channel constructed wetlands for wastewater treatment on a case-by-case basis.

The Mining Impoundments Exclusion

In the last triennial review, ADEQ created an exclusion from water quality standards for certain mining-related impoundments. The state adopted an exclusion which stated that water quality standards do not apply to:

> Man-made surface impoundments and associated ditches and conveyances used in the extraction, beneficiation and processing of metallic ores, including pregnant leach solution ponds, raffinate ponds, tailing impoundments, decant ponds, concentrate or tailing thickeners, blowdown water ponds, ponds and sumps in mine pits associated with dewatering activity, ponds holding water that has come in contact with process or product that is being held for recycling, spill or upset catchment ponds, or ponds used for on-site remediation provided that any discharge from any such surface impoundment to a navigable water is permitted under the National Pollutant Discharge Elimination System [See R18-11-103(2)].

On September 9, 1993, EPA disapproved the above exclusion on the grounds that the provision was unnecessary, created ambiguity regarding where water quality standards apply, and did not satisfy the requirements of 40 CFR 131.10(a) which requires the designation of uses for navigable waters. EPA stated in its disapproval letter that in order for the water quality standards rules to be approved, the state must either delete the mining impoundments exclusion or otherwise revise its regulations to ensure that mining-related impoundments which are "waters of the United States" are governed by appropriate water quality standards. In disapproving the mining impoundments exclusion, EPA acknowledged that most mining-related impoundments are not subject to water quality standards because they are located outside of "waters of the United States."

ADEQ revised the language of the mining impoundments exclusion in the adopted rule [See R18-11-102(B)(2)]. The revision of the language of the mining impoundments exclusion is intended to ensure that any manmade mining-related impoundment which is a "surface water" [i.e., a "water of the United States"] will be governed by appropriate water quality standards. ADEQ revised the language of the rule to exempt from water quality standards only those mining-related impoundments that are either: 1) not a "surface water" [e.g. a manmade mining impoundment located in an upland area outside of a "water of the United States"]; or 2) that are located in an area that may have been a surface water at 1 time but which has been legally converted to a water body that is not subject to Clean Water Act jurisdiction. The revised mining impoundment exclusion provides that water quality standards do not apply to:

> Man-made surface impoundments and associated ditches and conveyances used in the extraction, beneficiation, and processing of metallic ores, including pregnant leach solution ponds, raffinate ponds, tailing impoundments, decant ponds, concen-

trate or tailing thickeners, blowdown water ponds, ponds and sumps in mine pits associated with dewatering activity, ponds holding water that has come in contact with process or product that is being held for recycling, spill or upset catchment ponds, or ponds used for on-site remediation that are not surface waters or are located in areas that once were surface waters but no longer remain surface waters because they have been and remain legally converted.

The revised exclusion will provide more regulatory certainty by clarifying the scope of the water quality standards program as it applies to man-made mining impoundments. The state does not consider the types of manmade mining impoundments that are described in the exclusion to be "surface waters" or "waters of the United States."

ADEQ continues to believe that it is unreasonable to apply water quality standards to the types of mining-related impoundments that are intended to be covered by this exclusion. Congress did not intend that the goals and objectives of the Clean Water Act apply to such impoundments. For example, Congress could not reasonably have intended that manmade mining impoundments meet the interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and which provides for recreation in and on the water. The "fishable/swimmable" goals of the Clean Water Act are clearly unreasonable water quality objectives for pregnant leach solution ponds, tailings impoundments, and similar manmade impoundments.

The exclusion in the adopted rule includes a list of mining-related impoundments. This list provides examples of the types of man-made mining impoundments that are covered by the exclusion. The list is provided for illustrative purposes and it is not intended to be an exclusive list.

Revisions to the Tributary rule

The currently effective water quality standards rules include a provision at R18-11-104(D) which is commonly referred to as the tributary rule. The tributary rule establishes water quality standards for surface waters that are not specifically listed in Appendix B of the water quality standards rules.

The currently effective tributary rule at R18-11-104(D) provides a minimum level of water quality protection for unlisted tributaries by applying the water quality standards that have been established for the nearest downstream surface water that is listed in Appendix B. Under the currently effective rule, if the nearest listed downstream surface water is an ephemeral water, then the water quality standards that apply to that downstream ephemeral water [i.e., partial body contact (PBC) and aquatic and wildlife (ephemeral)(A&We)] apply only to those portions of the upstream tributary that also are ephemeral. For portions of an upstream tributary that are not ephemeral, the currently effective rule establishes the aquatic and wildlife (warm water fishery) and full-body contact water quality standards by default.

The operation of the currently effective tributary rule can result in the application of inappropriate water quality standards to unlisted tributaries. For example, if the nearest downstream surface water to an unlisted tributary is a perennial stream with a cold water fishery, then the tributary rule applies the water quality standards for that perennial water to all of the upstream tributaries, even if a tributary is an ephemeral water. A perennial stream with a cold water fishery typically will have the following designated uses: aquatic and wildlife [cold water fishery], fish consumption and full body contact. The operation of the currently effective tributary rule results in the application of these water quality standards to all upstream tributaries, even to dry washes that flow only in response to a storm event.

ADEQ revised the tributary rule to avoid the application of inappropriate water quality standards to unlisted tributaries. The revised tributary rule establishes water quality standards for 4 different types of tributaries: ephemeral waters, effluent dependent waters, tributaries that are neither ephemeral or effluent dependent and which have salmonids present, and tributaries that are neither ephemeral or effluent dependent which are warm water fisheries. Under the adopted rule, ephemeral tributaries are protected by water quality standards that are appropriate for ephemeral waters: aquatic and wildlife [ephemeral] and partial body contact. For tributaries that are effluent dependent waters, the aquatic and wildlife [effluent dependent water] and partial body contact water quality standards apply. Tributaries that have salmonids present are protected by aquatic and wildlife [cold water fishery] standards, fish consumption standards, and the water quality standards that apply to the nearest downstream surface water. Tributaries that are neither ephemeral or effluent dependent and which 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.

Modification of Water Quality Standards on Grounds of Net Ecological Benefit

ADEQ adopted a new Section, R18-11-106, which allows the modification of a water quality standard where it can be demonstrated that there is a net ecological benefit associated with the discharge of effluent to support or create a riparian or aquatic habitat in an area where such water resources are limited. Under the new rule, a water quality standard may be modified in an effluent dependent water if the following demonstrations are made:

1. The discharge of effluent creates or supports an ecologically valuable aquatic, wetland, or riparian ecosystem in an area where such resources are limited;
2. The ecological benefits associated with the discharge of effluent under a modified water quality standard exceed the environmental costs associated with the elimination of the discharge;
3. The cost of treatment to comply with a water quality standard is so high that it is more cost effective to eliminate the discharge of effluent rather than upgrade treatment; it is feasible to eliminate the discharge of effluent; and that a plan to do so is under active consideration;
4. The discharge of effluent will not cause or contribute to a violation of a water quality standard that has been established

for a downstream surface water;

5. All practicable point source control discharge programs, including local pretreatment, waste minimization, and source reduction programs are implemented;

6. The discharge of effluent does not produce or contribute to the concentration of a pollutant in the tissues of aquatic organisms or wildlife that is likely to be harmful to humans or wildlife through food chain concentration.

Because there is little or no dilution in ephemeral or effluent dependent waters, point source discharges often have to meet water quality criteria at the "end-of-the-pipe." Where water quality criteria cannot be met, a point source discharger may consider alternatives to discharge, including the complete removal of effluent from a surface water. High treatment costs associated with compliance with water quality-based discharge limitations may encourage point source dischargers to remove the effluent from such streams, resulting in the total loss of the effluent dependent ecosystem that is created by the discharge. In such cases, it may be appropriate to modify a water quality standard in order to allow continued discharge and maintenance of the effluent dependent ecosystem. The net ecological benefit rule may help to preserve or create in-stream flows which support desirable aquatic or riparian ecosystems. The adopted rule clarifies that a modification a water quality standard on the ground of net ecological benefit must be done through rulemaking.

Antidegradation

Each state must develop, adopt, and retain a statewide antidegradation policy and establish procedures for its implementation through the state's water quality management process. The state antidegradation policy and implementation procedures must be consistent with the federal antidegradation policy set out in 40 CFR 131.12. Arizona's antidegradation policy is found in the water quality standards rules at R18-11-107. The antidegradation rule can be summarized as providing 3 levels of water quality protection. These levels of protection are commonly referred to as Tiers 1, 2, and 3. In this rulemaking, ADEQ revised the antidegradation rule to use this terminology. The adopted rule clarifies that the determination of whether degradation is occurring in a surface water is on pollutant-by-pollutant basis [See R18-11-107(A)].

Proposed Escherichia coli [E. coli] Water Quality Standards

The currently effective water quality standards rules include microbiological water quality standards to maintain and protect water quality in surface waters that are used for full-body contact recreation. These full-body contact standards are expressed in terms of concentrations of an indicator organism, fecal coliforms [See R18-11-109(B)]. The currently effective fecal coliform criteria are based on recommendations made by the National Technical Advisory Committee to the Federal Water Pollution Control Administration [NTAC]. In 1968, the NTAC recommended the following microbiological criterion:

> Fecal coliforms should be used as the indicator organism for evaluating the microbiological suitability of recreation waters. As determined by the multiple-tube fermentation or membrane filter procedures and based on a minimum of not less than 5 samples taken over not more than a 30-day period, the fecal coliform content of primary contact recreation waters shall not exceed a log mean of 200 cfu/ 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 cfu / 100 ml.

In 1976, EPA recommended the fecal coliform criteria cited above as the microbiological water quality standards for recreational waters.

More recent studies by EPA have shown that in fresh waters, *E. coli* is 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)]. The EPA freshwater studies confirm that there is a strong correlation between densities of *E. coli* and swimming-related gastrointestinal illness and that there is no correlation between densities of fecal coliform organisms and swimming-related gastrointestinal illness. ADEQ adopted *E. coli* water quality criteria for the full-body contact designated use because *E. coli* organisms are a better indicator of the microbiological water quality in surface waters that are used for swimming.

The proposed numeric water quality criteria for *E. coli* are based upon EPA's national criteria guidance. EPA recommends that the geometric mean concentration of *E. coli* not exceed 126 cfu / 100 ml for freshwater bathing [See Ambient Water Quality Criteria for Bacteria - 1986, EPA 440/5-84-002, U.S. Environmental Protection Agency, Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C. (January 1986)]. EPA also recommends single sample maximum criteria that are calculated using different confidence limits associated with anticipated levels of use. EPA recommends a single sample maximum concentration of 576 cfu / 100 ml for surface waters that are infrequently used for bathing. Based upon this EPA criteria guidance, ADEQ proposes to adopt *E. coli* water quality criteria for surface waters with the full body contact designated use. ADEQ proposes to adopt a 30-day geometric mean criterion [5-sample minimum] of 130 cfu per 100 ml [the EPA-recommended density rounded to the nearest 10]. ADEQ proposes to adopt a single sample maximum criterion of 580 cfu / 100 ml [the EPA-recommended density rounded to the nearest 10].

Dissolved Oxygen in Effluent Dependent Waters

The currently effective water quality standard for dissolved oxygen in effluent dependent waters is 1.0 mg/L. The U.S. Environmental Protection Agency and others have criticized this dissolved oxygen standard as being inadequate to fully protect aquatic life in effluent dependent waters. ADEQ revised the currently effective standard by adopting diurnal water quality criteria for dissolved oxygen in effluent dependent waters. The adopted water quality criteria are expressed as single sample minimum concentrations. During the daylight hours, from 3 hours after sunrise to sunset, the minimum dissolved oxygen concentration for an

effluent dependent water is 3.0 mg/L. From sunset to 3 hours after sunrise, the single sample minimum concentration is 1.0 mg/L.

Dissolved oxygen is essential for all aquatic organisms that utilize aerobic respiration. There must be adequate dissolved oxygen in the water to maintain a community of aquatic organisms, even in an effluent dependent water where other conditions may limit species diversity and abundance. Tolerances to low dissolved oxygen levels vary from 1 species to the next.

EPA has surveyed a large body of literature to determine the range of tolerances of aquatic organisms to dissolved oxygen concentrations in water [See Ambient Water Quality Criteria for Dissolved Oxygen, EPA 440/5-86-003, U.S Environmental Protection Agency, Office of Water Regulations and Standards, Criteria and Standards Division, Washington D.C., 20460 (April 1986), p. 1]. The EPA national criteria recommendations for ambient dissolved oxygen concentrations for the protection of aquatic life in warm water are as follows:

	Early life stages	Other life stages
30-day mean	NA	5.5
7-day mean	6.0	NA
7-day mean minimum	NA	4.0
1-day minimum	5.0	3.0

EPA concludes that although some species need very little oxygen to survive, a dissolved oxygen minimum concentration is necessary to prevent mortality of sensitive warmwater organisms. A dissolved oxygen mean concentration may be necessary to prevent sustained low concentrations of dissolved oxygen which may adversely affect the reproduction, growth, and behavior of sensitive warmwater aquatic organisms.

ADEQ believes that the criteria document recommendations for dissolved oxygen to protect warmwater aquatic life should not be adopted for effluent dependent waters. However, the criteria document provides useful information which ADEQ considered in establishing water quality standards for dissolved oxygen to protect aquatic life in an effluent dependent water. In general, the research cited by EPA in the criteria document indicates that warmwater fish species appear to be less sensitive than salmonids to low dissolved oxygen concentrations. Since most effluent dependent waters are warm waters, ADEQ reviewed EPA's criteria document recommendations for warm water as a starting point for developing appropriate dissolved oxygen criteria.

Data in the criteria document indicate that the early life stage is the most sensitive life stage for warmwater fish species to low dissolved oxygen concentrations. Early life stages are considered to include those life stages up to 30 days post-hatch. In general, dissolved oxygen water quality criteria that are high enough to protect the early life stage of resident fish species in an effluent dependent water are probably adequate to maintain older life stage fish and invertebrate species.

There is little data on the acute effects of low dissolved oxygen concentrations on warmwater fish species. EPA criteria for early life stages of warmwater fish include a 1-day minimum [instantaneous] dissolved oxygen concentration of 5.0 mg/L. This criterion reflects EPA's conclusion that dissolved oxygen concentrations of less than 5.0 mg/L will be lethal to the early life stages of sensitive warm water fish species. Generally, adults and juveniles of all fish species can survive constant exposure to concentrations of dissolved oxygen as low as 3 mg/L. In most cases, no mortality results from acute exposures to 3 mg/L of dissolved oxygen for the 24-hour to 96-hour duration of acute tests. Some older life stage warmwater fish species appear to be able to survive a several day exposure to concentrations of dissolved oxygen below 1 mg/L. [It should be noted that EPA apparently used the highest no observed effect concentration [NOEC] to derive the 1-day minimum dissolved oxygen concentration of 3.0 mg/L for older life stage warmwater fish species, but used a value 1.0 mg/L higher than the NOEC for early life stage warmwater fish to derive the 1-day minimum concentration of 5.0 mg/L].

A number of studies of the effect of dissolved oxygen concentrations on growth are reported in the EPA criteria document. The 2nd dissolved oxygen criterion recommended by EPA to protect the early life stages of warmwater fish is a 7-day mean dissolved concentration of 6.0 mg/L. This is the minimum mean concentration that EPA believes is essential for adequate growth of sensitive warm water fish species in the early stages of life. It should be noted that the 7-day mean criterion of 6.0 mg/L incorporates a safety factor and is 0.5 mg/L above the concentration estimated to cause a slight decrease in growth for the most sensitive early life stage warmwater fish species. Other data in the national criteria document indicates that growth of warmwater fish species is reduced at lower dissolved oxygen concentrations. For example, 1 researcher who studied channel catfish found that there was a graded reduction in growth at each dissolved oxygen concentration below 6 mg/L. Several studies have provided evidence of mortality or other significant damage to young warmwater fish as a result of a few weeks exposure to continuous dissolved oxygen concentrations in the 3 to 6 mg/L range.

For the protection of older life stages of warmwater fish, EPA recommend 3 dissolved oxygen criteria. A 1-day minimum concentration of 3.0 mg/L is recommended to prevent mortality of sensitive warmwater fish. Because warmwater fish do not experience periods of rapid development and growth in their older life stages, a 30-day mean dissolved oxygen criterion is recommended by EPA. The 30-day averaging period assumes that warmwater fish in the older life stages can withstand dissolved oxygen concentrations approaching the lethal concentration for longer periods of time than can warmwater fish in the early life stage. A 7-day mean minimum value is recommended by EPA to limit periods of exposure to low dissolved oxygen to intervals that are expected not to be injurious to older life stage warmwater fish.

The application of these criteria recommendations to aquatic life in effluent dependent waters is questionable. EPA's criteria document recommendations for warmwater aquatic life were derived from laboratory data developed by researchers investigating dissolved oxygen concentrations that were lethal to, or caused reductions in growth in a relatively small number of fish species. In developing dissolved oxygen criteria for warmwater fish, EPA concluded that the data available for describing the effects of low dissolved oxygen on warmwater fish were more limited than that available for coldwater fish, yet the warmwater criteria had to provide for the protection of at least 600 warmwater fish species compared to about 38 coldwater fish species. EPA considered that the most pertinent data for developing dissolved oxygen criteria for warmwater fish had been obtained from more recent studies on the sunfish family, northern pike, channel catfish, and fathead minnow. However, these species represent only a small proportion of the resident species found in effluent dependent waters. Few data on dissolved oxygen tolerances of resident fish species in effluent dependent waters are available.

Also, the EPA criteria document recommendations are based upon the adverse effects of exposures to constant dissolved oxygen concentrations in water. None of the studies included exposures to dissolved oxygen concentrations that varied over a diurnal cycle similar to the diurnal cycle typically found in an effluent dependent water. However, EPA discusses the importance of such variations in the criteria document. For example, Carlson, et. al, report that channel catfish and yellow perch were able to tolerate lower dissolved oxygen concentrations when exposed for only a part of the diel cycle, than if they were exposed to constant dissolved oxygen concentrations [See Carlson, A.R., R.E. Seifert, and L.J Herman, "Growth and Survival of Channel Catfish and Yellow Perch Exposed to Lowered Constant and Diurnally Fluctuating Dissolved Oxygen Concentrations," Prog. Fish-Cult. 42: 73-78 (1980)].

Finally, the EPA criteria document recommendations are not supported by any data from field studies. There are no data in the EPA criteria document which demonstrate a significant relationship between minimum dissolved oxygen concentrations and the abundance and diversity of warmwater fish species. Moreover, factors other than low dissolved oxygen may be limiting in an effluent dependent water [e.g., low habitat quality, species competition, stream flow conditions, and effluent toxicity]. Given the uncertainty and all of the data gaps, the state has little basis for adopting the EPA national criteria document recommendations for dissolved oxygen to protect aquatic life in effluent dependent waters.

ADEQ adopted diurnal water quality criteria for effluent dependent waters. The standards recognize that dissolved oxygen levels in an effluent dependent water are subject to diurnal variation. During the day, the photosynthetic production of oxygen by aquatic plants in an effluent dependent water usually exceeds the uptake of dissolved oxygen by aquatic organisms and the oxygen demand associated with the decomposition of organic material in the effluent, resulting in higher concentrations of dissolved oxygen. However, at night, dissolved oxygen levels steadily decline as photosynthesis ceases and plant and animal respiration, coupled with the oxidation of carbonaceous and nitrogenous material gradually deplete the available dissolved oxygen in the water column. The proposed standard of 1.0 mg/L for the night recognizes the dissolved oxygen sag that typically occurs at night in an effluent dependent water.

The diurnal standards for dissolved oxygen represent an improvement over the currently effective water quality standard of 1.0 mg/L which applies to an effluent dependent water on a continuous basis. The daytime standard of 3.0 mg/L is more stringent and provides a higher level of protection for aquatic organisms.

The adopted dissolved oxygen criteria are similar to dissolved oxygen criteria that were recently developed on a site-specific basis for an effluent dependent water in Colorado, the South Platte River [See "Proposed Site-Specific Dissolved Oxygen Criteria, South Platte River Segment," Camp Dresser & Mckee, Inc., V. 1, June 1994]. In the site-specific study of the South Platte River, researchers investigated diurnal variations in dissolved oxygen concentrations and their effect on resident fish species. The research done on developing site-specific dissolved oxygen criteria for the South Platte River suggests that the dissolved oxygen criteria are protective of resident species in Arizona's effluent dependent waters. Nineteen species of fish have been documented to inhabit effluent dependent waters in Arizona. Ten of these are also found in the South Platte River. Four other species are represented by a member of the same genus. When the South Platte site-specific study was initiated, of the species known to inhabit the river, the 3 species that were considered most likely to be the most sensitive to low dissolved oxygen were fathead minnow, channel catfish, and largemouth bass. All of these species are found in Arizona effluent dependent waters. Of these 3 species, No-Observed-Effects Concentration (NOEC) data were generated on Older Life Stages (OLS) for fathead minnow and largemouth bass; and Earlier Life Stages (ELS) for fathead minnow (see Table 1 below).

Laboratory Test	Fathead Minnow	Largemouth Bass
OLS NOEC - 1 Day minimum NOEC survival (mg/L)	< 0.9	< 0.8
OLS NOEC - 7 Day mean minimum NOEC DO survival (mg/L)	< 1.1	< 0.9
ELS - 1 Day minimum NOEC larval survival (mg/L)	2.0	No data available

ELS - 1 Day minimum NOEC hatching success (mg/L)	< 1.0	No data available
ELS - 30 Day mean NOEC larval growth (mg/L)	5.1	No data available

The results of the South Platte River study suggest that, for largemouth bass and the fathead minnow, the state's 1.0/3.0 mg/L diurnal standard is relatively protective for the 1-day and 7-day minimums.

Also, dissolved oxygen data from Arizona effluent dependent waters show that dissolved oxygen concentrations range from > 1 mg/L to > 12 mg/L on a daily basis and that occasionally super-saturation occurs. Consequently, it is likely that daily means are at or greater than the 30-day mean NOEC larval growth value of 5.1 mg/L that was found for fathead minnow in the South Platte River.

While there are not enough data to develop a more scientifically-based EDW dissolved oxygen standard in Arizona, enough information exists to suggest that the adopted dissolved oxygen criteria are adequately protective. To determine whether or not that assumption is correct, it will be necessary to have regional or site-specific studies to determine what is the most sensitive species inhabiting Arizona effluent dependent waters. For example, the information cited from the South Platte River study pertained only to fathead minnow and largemouth bass. That study found that the Johnny darter (not resident in Arizona effluent dependent waters) was the most sensitive fish species inhabiting the South Platte River EDW. Consequently, the site-specific water quality criteria for the South Platte River were based on protecting the Johnny Darter.

In the absence of site-specific data to justify dissolved oxygen criteria for an effluent dependent water, ADEQ adopted a 1.0 mg/L as an absolute minimum. During the current triennial review, the state has proposed making the absolute minimum standard more stringent during daytime hours (daytime = 3.0 mg/L; nighttime = 1.0 mg/L).

Turbidity

Turbidity is a measure of water clarity. Changes in turbidity are caused by the presence of organic and inorganic particulate matter that is suspended in water such as clay, silt, finely divided organic material, bacteria, plankton, and other microscopic organisms. Arizona's currently effective water quality standards for turbidity are expressed as maximum concentrations in nephelometric turbidity units [NTUs]. The following turbidity standards currently apply to surface waters in Arizona:

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

The currently effective turbidity criteria were established primarily to protect aquatic life from the adverse effects of high concentrations of suspended solids in water. The negative effects of turbidity or suspended solids in surface waters are well documented. Increased turbidity in the water column limits light penetration in a surface water, resulting in decreased photosynthesis and limited growth of aquatic plants. The settling of suspended solids in a surface water can result in oxygen depletion. Siltation of surface waters may blanket the bottom of a water body, cover gravel spawning beds, reducing oxygen exchange, and physically damaging or suffocating aquatic organisms. When settled solids are resuspended in the water column of a surface water, biochemical oxygen demand can increase eightfold. The resuspension of settled solids also may result in the release of toxic chemicals that are complexed with or absorbed onto the settled sediments. Finally, suspended solids may have direct detrimental effects on aquatic organisms. Fish may be physically affected by abrasive injuries and gill clogging. The net results for fish populations are increased mortality, reduced growth rates, or decreased resistance to disease.

ADEQ recognizes that turbid water may interfere with the recreational use and aesthetic enjoyment of a surface water. For example, turbid water may be dangerous for swimming and diving because of the possibility of unseen submerged hazards and the difficulty of locating swimmers who are in danger of drowning. In general, the less turbid the water, the more desirable it becomes for swimming and other water recreation. However, the currently effective numeric water quality criteria for turbidity for the full-body contact and partial body contact designated uses were not established to protect recreational uses. The numeric water quality criteria of 50 NTUs and 25 NTUs have no relationship to the maintenance of water quality for primary or secondary contact recreation. They were established to protect aquatic organisms from the adverse effects associated with high concentrations of suspended solids. In the adopted rule, ADEQ eliminated the numeric water quality criteria for turbidity which have been established for the full-body contact and partial body contact water quality designated uses because they are not scientifically defensible.

Unique waters

The Director of the ADEQ may classify a surface water as a unique water upon making a finding that the surface water is an outstanding state resource water. The Director may make a finding that a surface water is an outstanding state resource water based upon 1 or both 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.

ADEQ classified the following surface waters as unique waters in this rulemaking:

1. Aravaipa Creek from the confluence of Stowe Gulch to the downstream boundary of the Aravaipa Canyon Wilderness Area;
2. Cave Creek and the South Fork of Cave Creek in the Chiricahua Mountains, from their headwaters to the Coronado National Forest boundary; and
3. Buehman Canyon Creek; from its headwaters to approximately 9.8 miles downstream.

Each of these surface waters meets the criteria for classification as a unique water. A brief description of each proposed unique water follows. A more complete description of each surface water is contained in a unique water nomination document for each surface water which is on file in the ADEQ Water Quality Assessment Unit.

Aravaipa Creek

Aravaipa Creek is located within Graham and Pinal Counties and is tributary to the San Pedro River. The perennial reach of Aravaipa Creek begins at the confluence of Stowe Gulch and usually flows to the confluence of Holy Joe Canyon where the streamflow goes subsurface. The creek is located in the Aravaipa Canyon Wilderness Area. Aravaipa Creek has long been recognized as a significant natural resource because of its ecological importance, wilderness characteristics, and recreational value.

Aravaipa Creek is widely recognized as 1 of Arizona's best remaining native fish habitats. The creek provides habitat for 7 species of native fish, 2 of which are currently listed on the U.S. Fish & Wildlife Service's list of threatened and endangered species [the spikedace (*Meda fulgida*) and the loach minnow (*Tiaroga cobitia*)]. Fish counts by the Game & Fish Department also have shown the presence of the threatened Colorado Roundtail Chub [*Gila robusta*].

In addition to threatened or endangered fish species, Aravaipa Creek and its tributary canyons provide valuable habitat for the following threatened or endangered species which utilize the area either as full-time residents, winter residents, or as migrants: American peregrine falcon, gray hawk, common black hawk, red bat, great egret, snowy egret, black-bellied whistling duck, bald eagle, osprey, yellow-billed cuckoo, belted kingfisher, rose-throated becard, and willow flycatcher.

Cave Creek and South Fork of Cave Creek

Cave Creek and the South Fork of Cave Creek are located on the eastern side of the Chiricahua Mountains in southeastern Arizona. Both surface waters are located within the Coronado National Forest. The headwaters of both surface waters are located within the Chiricahua Wilderness Area.

Due to the presence of perennial flow in Cave Creek and the South Fork of Cave Creek and the combination of varied life zones through which these surface waters descend, the Cave Creek Canyon watershed has been described as a "natural treasure" and "1 of the premier sites for field biology in the world." The American Museum of Natural History operates the Southwestern Research Station in Cave Creek Canyon to conduct long-term research into what has been described as "probably the richest biota in the United States."

The Cave Creek Canyon watershed is well known for the abundance and diversity of its bird species. Over 200 bird species have been identified. Other important wildlife species which inhabit the Cave Creek Canyon watershed include black bear, white-tailed deer, mountain lion, ringtail cat, coatimundi, striped skunk, Apache squirrel, and wild turkey. Cave Creek and the South Fork of Cave Creek provide habitat for the following threatened and endangered species: Sanborn's Long-nosed Bat, Mexican Long-Tongued Bat, Red Bat, Chiricahua Leopard Frog, American Peregrine Falcon, Mexican Spotted Owl, Violet-crowned Hummingbird, Elegant Trogon, Buff-breasted Flycatcher, and Northern Goshawk. Several threatened and endangered plant species also have been identified in the Cave Creek and South Fork of Cave Creek canyon areas.

Buehman Canyon Creek

Buehman Canyon Creek is an outstanding state resource water located approximately 20 miles northeast of Tucson, Arizona, in the Coronado National Forest. Buehman Canyon Creek originates on the east slope of the Santa Catalina Mountains and trends in a generally easterly direction for approximately 13 miles to its confluence with the San Pedro River. Buehman Canyon Creek is an unusual and unique surface water which provides a continuous wildlife migration corridor between the upper elevations of the Santa Catalina Mountains and the San Pedro River valley. Buehman Canyon Creek descends through several different life zones and supports a rich diversity of flora and fauna, including numerous species that are listed or are candidates for listing as threatened or endangered species. Buehman Canyon Creek also provides exceptional recreational opportunities. The creek's proximity to Tucson, Arizona, and its outstanding scenery and wilderness characteristics make it a valuable resource for outdoor recreation, including nature study, hiking, photography, and birdwatching.

Aravaipa Creek, Cave Creek, South Fork of Cave Creek, and Buehman Canyon Creek support outstanding riparian areas. The protection and restoration of such riparian habitat is critically important in Arizona. Arizona's riparian ecosystems are limited, occu-

pying less than 0.5% of the landscape. However, they constitute Arizona's richest environments in terms of plant and animal productivity and biodiversity. The Game and Fish Department has estimated that 75% or more of all Arizona's native wildlife species depend on healthy riparian ecosystems during some portion of their life cycle. Riparian systems are critical to the survival of approximately 60% of the Arizona fish and wildlife species that are identified as threatened or endangered.

Desert riparian areas have been described as Arizona's most threatened natural community. According to most estimates, over 90% of the riparian areas along Arizona's major desert watercourses have been lost, altered, or degraded as a result of man's activities. These activities include mining, sand and gravel extraction, grazing, timber harvesting, groundwater pumping, water diversion, impoundments, channelization, flood control, and urbanization.

In recognition of the critical importance of desert riparian habitat to Arizona, Governor Rose Mofford signed Executive Order 89-16 on June 10, 1989. This executive order directs all state agencies to determine whether current and proposed policies, actions, and requirements impact stream and riparian resources and, when appropriate, to implement changes that will allow for the restoration of riparian resources. On February 14, 1991, Governor Rose Mofford signed Executive Order 91-6. Executive Order 91-6 again recognizes the critical importance of riparian areas to Arizona and states that it is Arizona's policy to actively encourage and develop management practices that will result in the maintenance of existing riparian areas and the restoration of degraded riparian areas and to actively encourage the preservation, maintenance, and restoration of instream flows throughout the state. The unique waters classifications will further Arizona's policy with regard to protection and management of the state's remaining riparian areas.

ADEQ repealed certain site-specific standards for unique waters that are prescribed in R18-11-112(F). In general, ADEQ repealed the site-specific standards where the default water quality standards which apply to all surface waters are more stringent. Also, ADEQ adopted site-specific standards for 2 unique waters, Cienega Creek and Bonita Creek, which were classified as unique waters during the last triennial review. Finally, ADEQ updated the lists of endangered or threatened species that are incorporated by reference in the unique waters rule.

Effluent Dependent Waters

ADEQ revised the descriptions of many of the effluent dependent waters in the state. The descriptions in the adopted rule are more accurate because they are based upon survey information obtained from the operators of the wastewater treatment plants which create the effluent dependent waters. ADEQ deleted several effluent dependent waters from the rules either because: 1) they are located on tribal lands that are outside the state's jurisdiction, or 2) the wastewater treatment plant that originally created the effluent dependent water has stopped discharging and the effluent dependent water no longer exists.

Practical Quantitation Limits [PQLs]

In the last triennial review, ADEQ adopted R18-11-120(B). This subsection states:

> A numeric water quality standard may be established at a concentration that is below the practical quantitation limit. In such cases, the water quality is enforceable at the practical quantitation limit. The applicable practical quantitation limits are prescribed in Appendix C of this Article.

The PQL is defined as the lowest level that is achievable by laboratories, within specified limits, during routine laboratory operations. As such, the PQL represents a practical and routinely achievable detection limit with a relatively good certainty that any reported value is reliable. It thus provides a compliance limit that is both quantifiable and enforceable.

ADEQ adopted R18-11-120(B) during the last triennial review to provide regulatory certainty regarding the enforcement of water quality standards. During the last triennial review, ADEQ acknowledged that many of the numeric water quality standards for toxic pollutants were established at concentrations that could not be reliably detected and quantified. ADEQ adopted R18-11-120(B) to provide guidance to the regulatory community regarding the enforcement of water quality standards that were expressed at concentrations below reliable levels of detection and quantification. ADEQ stated in the rule that such water quality standards are enforceable at the PQL. ADEQ also adopted Appendix C which prescribes the specific PQLs at which the water quality standards would be enforced.

On September 9, 1993, EPA disapproved the inclusion of PQLs in Appendix C. While EPA found that the PQLs that were prescribed in Appendix C were acceptably derived and reasonable, EPA objected to the inclusion of PQLs in the rule because the PQLs could not be readily modified to keep pace with improvements in analytical technology. EPA stated that ADEQ must remove Appendix C from the rules for the water quality standards to be approved. EPA did not fundamentally object to the use of PQLs for enforcement purposes and stated that ADEQ could include PQLs in a policy statement or guidance document.

ADEQ amended R18-11-120(B) in response to this EPA disapproval. ADEQ retained the general statement of enforcement policy which states that ADEQ will enforce any water quality standard that is established at a concentration that is below the practical quantitation limit at the PQL. However, ADEQ repealed the sentence in R18-11-120(B) which states that "[t]he applicable PQLs are prescribed in Appendix C of this Article." The repeal of this sentence and Appendix C will resolve the EPA disapproval and avoid a federal promulgation of water quality standards in this regard. ADEQ intends to list specific PQLs in a separate guidance document.

Schedules of compliance

In 1992, ADEQ adopted R18-11-121 which authorizes schedules of compliance for water quality standards. This rule was adopted in response to an EPA administrative decision entitled In the Matter of Star-Kist Caribe, Inc. [April 16, 1990]. In Star-Kist, the Administrator of EPA held that schedules of compliance for water quality-based permit limitations may not be included in an

NPDES permit unless a state explicitly authorizes schedules of compliance in its water quality standards regulations. EPA held that if the state water quality standards rules are silent with regard to schedules of compliance, then it must be assumed that the omission is deliberate and that the state does not allow schedules of compliance for water quality standards. In response, ADEQ adopted to R18-11-121 to clearly and unambiguously authorize schedules of compliance for water quality standards.

In this triennial review, ADEQ amended the time frames that apply to schedules of compliance. The currently effective rule states at R18-11-121(A) that a compliance schedule which is established in an NPDES permit shall require compliance with water quality-based discharge limitations within 3 years of the effective date of the water quality standard. ADEQ amended this provision to require compliance with a "new or revised" water quality standard within 3 years of the effective date of an NPDES permit.

Under the previous rule, schedules of compliance were allowed for any water quality standard adopted after August 13, 1986. However, in order to reach the goals and objectives of the Clean Water Act, it is not adequate to allow all water quality standards adopted or revised after a specific date to be the subject of schedules of compliance. For example, a schedule of compliance should not be available for a water quality standard that was adopted 10 years ago in 1986. The purpose of R18-11-121 is to authorize schedules of compliance which can be used to give an existing point source discharge a reasonable amount of time to modify or install necessary treatment to achieve compliance with a "new or revised" water quality standard. The adopted rule allows schedules of compliance only for "new or revised" water quality standards. By a "new or revised" water quality standard, ADEQ mean a water quality standard that becomes effective during the current NPDES permit cycle for an existing point source discharge. ADEQ believes that it is reasonable to give an existing point source up to 3 years from the effective date of a reissued NPDES permit to come into compliance with a "new or revised" water quality standard.

ADEQ proposed the repeal of the last sentence of R18-11-121(C) which states that a schedule of compliance for a stormwater discharge shall require compliance with water quality standards no later than 10 years after the effective date of a water quality standard. In the last triennial review, ADEQ established this 10-year period as a compliance "window" for stormwater discharges. ADEQ created this "window" to allow time for Congress to resolve issues related to stormwater discharges in Clean Water Act reauthorization. In particular, ADEQ hoped that Congress would clarify whether numeric water quality-based discharge limitations to ensure compliance with state-adopted water quality standards are required in NPDES stormwater permits or whether a nonpoint source control management approach [i.e., implementation of best management practices] should be used to achieve compliance with water quality standards. Unfortunately, the Clean Water Act has not been reauthorized as of the date of the agency adoption of these rules and Congress has not resolved this difficult issue. ADEQ received numerous public comments urging the state to retain the 10-year schedule of compliance "window" for stormwater discharges. ADEQ considered these comments but has decided not to retain the 10-year timeframe. A 10-year timeframe is not consistent with timeframes for schedules of compliance in analogous provisions of the Clean Water Act. The adopted rule authorizes a schedule of compliance in an NPDES stormwater permit and remains silent with regard to a maximum timeframe. The establishment of a maximum timeframe is left to the discretion of the permit-issuing authority [i.e., EPA]. EPA has generally limited schedules of compliance to the term of the permit within which it issued. In the case of NPDES stormwater permits, the maximum timeframe would be 5 years. The adopted rule states that a schedule of compliance shall require the implementation of all reasonable and cost-effective best management practices to achieve compliance with water quality standards. This provision is consistent with the state's position that the control of the discharge of pollutants in stormwater should be addressed through the implementation of best management practices, not the imposition of water quality-based effluent limitations in an NPDES stormwater permit.

Variances

ADEQ adopted a new Section which establishes a procedure for granting a variance from a water quality standard [See R18-11-122]. EPA has stated that variances from state-adopted water quality standards are allowed [See Water Quality Standards Handbook, 2nd Edition, EPA-823-B-94-005a, U.S.

Environmental Protection Agency, Water Quality Standards Branch, Office of Science & Technology, Washington, D.C., § 5.3 (August 1994)].

According to EPA guidance, a variance from water quality standards involves the same substantive and procedural requirements which 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 the 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.

The adopted rule makes it possible to grant 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 the surface water.

In the last 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. ADEQ believes that a variance procedure should be included in the water quality standards rules to provide some regulatory flexibility when it is not technically or economically feasible for a point source discharger to achieve compliance in the short term. 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 the adopted rule, a variance may be granted on a discharger-specific basis for a period of up to 5 years. ADEQ anticipates that a variance will be implemented through an NPDES permit for a specific discharge. The point source discharger would have to 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 will have to 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. The applicant for a variance also will have to 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. An applicant for a variance will be required to 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 will have to demonstrate that reasonable progress towards achieving compliance with the water quality has been made during the term of the variance.

The adopted rule 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.

Repeal of Article 2. Discharge Limitations

ADEQ repealed Article 2 in this rulemaking. The 3 currently effective Sections in Article 2 [R18-11-202, R18-11-203 and R18-11-205] have been moved to Article 1 of the proposed rules.

R18-11-202, which establishes discharge limitations for phosphates for certain specific surface waters has been moved to R18-11-109(H)(11) and (12). In relocating this Section, ADEQ deleted references to surface waters that are located on tribal lands. The prohibition on the discharge of treated wastewater to Sabino Creek at R18-11-203 has been relocated to R18-11-123 without change. Finally, ADEQ relocated R18-11-205 [which addresses discharge limitations for point source discharges to ephemeral waters] to R18-11-113(E).

Revisions to Numeric Water Quality Criteria in Appendix A

ADEQ repealed the currently effective Appendix A and replaced it with a new, reformatted appendix. The revised Appendix A is separated into 2 tables. Table 1 lists the numeric water quality criteria to protect human health and agricultural uses. These include the domestic water source [DWS], fish consumption [FC], full body contact [FBC], partial body contact [PBC], agricultural irrigation [AgI], and agricultural livestock watering [AgL] designated uses. Table 2 lists the numeric water quality criteria to protect aquatic life and wildlife. The division of Appendix A into 2 tables will enhance the readability of the water quality standards.

The reformatted tables include a column for the chemical abstract system [CAS] number for each pollutant. Many chemicals have similar names and spellings and some have multiple names. The chemical abstract number is a specific identifier for each chemical. The identification of the chemical by CAS number will provide certainty as to the chemicals for which water quality standards have been established.

ADEQ updated the numeric water quality criteria that have been established to protect human health. No changes were made to the numeric water quality criteria that have been established to protect the aquatic and wildlife designated uses [A&Wc, A&Ww, A&Wedw, and A&We] or the agricultural uses [AgI and AgL].

In the last triennial review, ADEQ used EPA methodologies to derive water quality criteria to protect the domestic water source [DWS], full body contact [FBC], and fish consumption [FC] designated uses. Separate methodologies were used to derive water quality criteria for carcinogens and non-carcinogens to protect human health. The methodology used to derive criteria for pollutants that are carcinogens utilizes a cancer potency slope value, or a q1*, in the equation used to calculate the criterion. The methodology to derive a water quality criterion for a non-carcinogen utilizes a reference dose, or a Rfd. The q1* and Rfd values were obtained from EPA's Integrated Risk Information System database [IRIS].

Where values for cancer potency slopes or reference doses have been revised in the IRIS database, ADEQ recalculated the numeric water quality criteria using the updated values. If a new q1* or Rfd has been published in the IRIS database, ADEQ used the new value to recalculate the criterion. If a q1* has been withdrawn and a Rfd is available, then ADEQ recalculated the numeric water quality criterion using the methodology for non-carcinogens and the available Rfd. If a q1* has been withdrawn and no Rfd is available, then ADEQ withdrew the numeric water quality criterion and replaced it with "NNS" or "no numeric standard."

ADEQ did not change any of the methodologies used to derive water quality criteria to protect the human health-related designated uses in this rulemaking, with the exception of the following: 1) the equation used to derive a numeric water quality criteria for arsenic for the fish consumption designated use; and 2) the methodology used to derive numeric water quality criteria for the partial body contact designated use [See discussions below].

Numeric water quality criteria to protect the domestic water source designated use were updated based upon available National Primary Drinking Water Maximum Contaminant Levels [MCLs]. If a new MCL has been published for a pollutant since the last triennial review, then ADEQ adopted the MCL as the numeric water quality criterion for that chemical for the domestic water source designated use.

Partial-body contact designated use

In the last triennial review of water quality standards, Arizona adopted water quality criteria for toxic pollutants for the partial-body contact designated use [PBC]. ADEQ originally proposed that no water quality criteria be prescribed for the PBC designated use because of the lack of a scientifically defensible methodology for deriving water quality criteria and the lack of data regarding dermal exposure to toxic pollutants. Dermal exposure was thought to be the principal route of exposure to toxic pollutants through the PBC designated use.

ADEQ subsequently accepted a methodology for deriving water quality criteria for the PBC designated use recommended by the regulated community. This methodology and its rationale are republished in the Rationale for the Development of Toxic Pollutant Standards to Protect Human Health [March 12, 1996], pp. 5-7. In general, ADEQ used EPA 1-day health advisory values as the basis for water quality criteria for the PBC designated use where such values were available. The EPA 1-day health advisory values were recalculated using a water consumption rate of 0.5 liter instead of 2 liters per day. This recalculation was done because human exposure to a pollutant through water ingestion while engaged in partial body contact recreation was assumed to be unlikely and exposures also were assumed to be infrequent. Where 1-day health advisory values were unavailable, ADEQ used either a reference dose or a No Observed Adverse Effects Level [NOAELs] to derive a water quality criterion for the PBC designated use.

The calculation of the numeric water quality criteria for the partial body contact designated use are based upon EPA 1-day health advisory standards [ODHA]. Where an ODHA is not available, ADEQ calculated a water quality criterion for the partial body contact designated use using the reference dose, [Rfd]. Where neither an ODHA or a Rfd is available, then no numeric standard was calculated for the partial body contact designated use. After all the recalculations were completed, if the numeric water quality criterion for the partial body contact was more stringent than the numeric water quality criterion for the full body contact designated use, then the full body contact criterion was lowered to equal the partial body contact criterion.

The tables on the following pages present the revisions that have been made to the currently effective numeric water quality criteria for the DWS, FC, FBC, and PBC designated uses. The table includes a column which indicates a "+" or a "-" for each pollutant. A "+" means that the adopted water quality criterion is less stringent than the 1992 standard or that the numeric water quality criterion was revised to "no numeric standard." A "-" means that the adopted standard is more stringent than the 1992 standard or that a "no numeric standard" is replaced with a calculated water quality criterion.

DOMESTIC WATER SOURCE				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Acenaphthylene	+	0.003	NNS	Now classified as a Class D carcinogen. No RfD available.
Antimony	+	2.8 T	6 T	Published MCL is 6 µg/L and is expressed as total antimony.
Barium	+	1000 D	2000 T	Published MCL is 2000 µg/L and is expressed as total barium.
Benzo (a) pyrene	+	0.003	0.2	Published MCL is 0.2 µg/L.
Benzo (ghi) perylene	+	0.003	NNS	Now classified as a Class D carcinogen. No RfD available.
Beryllium	+	0.008 T	4 T	Published MCL is 4 µg/L and is expressed as total beryllium.
Bis(2-ethylhexyl)phthalate (Di(2-ethylhexyl)phthalate)	+	2.5	6	Published MCL is 6 µg/L.
Boron	-	NNS	630	A new RfD (0.09) has been listed on IRIS.
Cyanide	+	140 T	200 T	Published MCL is 200 µg/L.

DOMESTIC WATER SOURCE				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
1,3-Dichloropropene	-	2.1	0.2	Incorrectly considered non-carcinogen in 1992 standards. Recalculated as carcinogen with q1* of 0.18.
2,4-Dinitrotoluene	+	0.009	14	New RfD (0.002) published.
Endosulfan-alpha	+	0.35	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed on IRIS for Endosulfan (Total).
Endosulfan-beta	+	0.35	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed on IRIS for Endosulfan (Total).
Endosulfan (Total)	+		42	See rationale for Endosulfan-alpha or -beta.
Hexachlorobenzene	+	0.02	1	Published MCL is 1 µg/L.
Hexachlorocyclopentadiene	+	49	50	Published MCL is 50 µg/L.
Isophorone	+	8.5	36.8	New q1* (0.001) published.
Manganese	-	NNS	4900 T	New RfD (0.005) published.
Mercury	-	2.1 T	2 T	Published MCL is 2 µg/L.
Methyl Chloride (Chloromethane)	+	5.7	NNS	No RfD published.
Methylene Chloride (Dichloromethane)	+	4.7	5	Published MCL is 5 µg/L.
Nickel	-	140 T	100 T	Published MCL is 100 µg/L.
Pentachlorophenol	-	210	1	Published MCL is 1 µg/L.
Phenanthrene	+	0.003	NNS	Classified as a Class D carcinogen. No RfD available.
Thallium	+	0.63 T	2 T	Published MCL is 2 µg/L.
1,2,4-Trichlorobenzene	-	NNS	70	Published MCL is 70 µg/L.
1,1,2-Trichloroethane	+	0.61	5	The MCL is now 5 µg/L.
Zinc	-	5000 T	2100 T	New RfD (0.3) published.

FISH CONSUMPTION				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Acenaphthylene	+	0.002	NNS	Now classified as a Class D carcinogen. No RfD available.
Arsenic	+	3.1 T	1450	Now classified as a non-carcinogen for tissue consumption on the basis that arsenic in tissue is primarily the relatively non-toxic organic form rather than the relatively toxic inorganic form. The RfD (0.0003) was used to calculate the standard, and the result was multiplied by a 0.9 uncertainty factor to account for the possibility of some inorganic arsenic.
Benzidine	+	0.0007	0.002	New q1* (4.3) published.
Benzo (ghi) perylene	+	0.00001	NNS	Now classified as a Class D carcinogen. No RfD available.
Cadmium	-	83 T	41 T	Error in 1992 standards calculation corrected.
Dibromochloromethane (Bromodichloromethane)	+	10	22	New q1* (0.06) published.
1,3-Dichlorobenzene	+	1200	2000	Error in 1992 standards calculation corrected.
1,3-Dichloropropene	-	360	6.6	Error in 1992 standards calculation corrected.
2,4-Dinitrotoluene	+	0.02	163	New RfD (0.002) published.
Endosulfan-alpha	+	0.92	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed on IRIS for Endosulfan (Total).
Endosulfan-beta	+	0.92	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed on IRIS for Endosulfan (Total).
Endosulfan (Total)	+		110	See rationale for Endosulfan-alpha or -beta.
Isophorone	+	520	2300	New q1* (0.001) published.
Methyl Chloride (Chloromethane)	+	1800	NNS	No RfD published.
Nickel	+	400 T	730 T	Error in 1992 standards calculation corrected.
N-nitrosodiphenylamine	+	12	14	Rounding error in 1992 standards calculation corrected.
Pentachlorophenol	-	29000	8.2	New q1* (0.12) published.

FISH CONSUMPTION				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Phenanthrene	+	0.0005	NNS	Classified as a Class D carcinogen. No RfD available.
Thallium	-	44 T	41 T	The RfDs for 5 species of thallium were averaged to arrive at a total RfD of 0.00008.
1,2,4-Trichlorobenzene	-	NNS	155	New RfD (0.01) published.
1,1,1-Trichloroethane	+	160000	NNS	No RfD published.
Trichloroethylene	+	78	NNS	No RfD published.
Zinc	-	NNS	22000 T	New RfD (0.3) published.

FULL BODY CONTACT				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Acenaphthylene	+	0.12	NNS	Acenaphthylene is now considered a class D carcinogen. No RfD is published.
Acrolein	+	1300	2200	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
Alachlor	-	NNS	1400	New RfD (0.01) published.
Anthracene	-	420000	42000	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
Atrazine	-	NNS	4900	New RfD (0.035) published.
Barium	+	1000 D	9800 D	New RfD (0.07) published.
Benzo (a) pyrene	+	0.12	0.2	New q1* (7.3) published.
Benzo (ghi) perylene	+	0.12	NNS	Benzo (ghi) perylene is now considered a class D carcinogen. No RfD is published.
Beryllium	+	0.33 T	4 T	The calculated standard is less than the MCL; the MCL was substituted[2].
Boron	-	NNS	12600	New RfD (0.09) published.
Carbofuran	-	NNS	700	New RfD (0.005) published.

FULL BODY CONTACT				
Parameter	+/-	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Chlorine (total residual)	-	NNS	14000	New RfD (0.1) published.
Cyanide	-	3100 T	2800 T	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
Dichlorobromomethane (Bromodichloromethane)	+	11	100	The calculated standard is less than the MCL; the MCL was substituted[2].
1,2-Dibromoethane	-	NNS	1.6	New q1* (0.85) published.
1,1-Dichloroethane	+	14000	NNS	There is no RfD for 1,1-Dichloroethane and it is considered a class C carcinogen.
2,4-Dichlorophenoxyacetic acid	-	NNS	1400	New RfD (0.01) published.
1,2-Dichloropropane	+	200	NNS	There is no RfD or q1* available.
1,3-Dichloropropene	-	60	7.8	Error in 1992 standards calculation corrected.
2,4-Dimethylphenol	-	28000	2800	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
Dimethyl phthalate	-	14000000	1400000	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
2-methyl-4,6-Dinitrophenol (4,6-Dinitro-o-cresol)	-	550	55	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
2,4-Dinitrotoluene	+	0.380	280	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
Endosulfan-alpha	+	70	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed for Endosulfan (Total). The FBC standard for this toxicant is driven by the PBC standard. See PBC change table.

FULL BODY CONTACT				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Endosulfan-beta	+	70	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed for Endosulfan (Total). The FBC standard for this toxicant is driven by the PBC standard. See PBC change table.
Endosulfan (Total)	+		840	See rationale for Endosulfan-alpha or -beta.
Ethylbenzene	-	64000	14000	The FBC standard for this toxicant is driven by the PBC standard.[1] See PBC change table.
Heptachlor	+	0.31	0.4	The calculated standard is less than the MCL; the MCL was substituted[2].
Heptachlor epoxide	+	0.15	0.2	The calculated standard is less than the MCL; the MCL was substituted[2].
Hexachlorobenzene	+	0.83	1	The calculated standard is less than the MCL; the MCL was substituted[2].
Isophorone	+	340	1500	New q1* (0.001) published.
Manganese	-	NNS	19600 T	New RfD (0.005) published.
Methoxychlor	-	NNS	700	New RfD (0.005) published.
Methyl Chloride (Chloromethane)	+	230	NNS	No RfD published.
Naphthalene	+	560	NNS	Naphthalene is now considered a class D carcinogen. No RfD is published.
Nitrate	-	NNS	224000	New RfD (1.6) published.
Nitrite	-	NNS	14000	New RfD (0.1) published.
Pentachlorophenol	-	2000	11.7	New q1* (0.12) published.
Phenanthrene	+	0.120	NNS	Phenanthrene is now considered a class D carcinogen. No RfD is published.
Polychlorinatedbiphenals	+	0.18	0.5	The calculated standard is less than the MCL; the MCL was substituted[2].
Selenium	+	420 T	700 T	Error in the 1992 standards calculation was corrected.
Styrene	-	NNS	28000	New RfD (0.2) published.

FULL BODY CONTACT				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Thallium	-	3700 T	12 T	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
Toluene	-	42000	28000	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.
1,2,4-Trichlorobenzene	-	2800	1400	New RfD (0.01) published.
1,1,1-Trichloroethane	+	13000	NNS	No RfD published.
Trichloroethylene	+	110	NNS	No RfD published.
2-(2,4,5-Trichlorophenoxy) proprionic acid	-	NNS	1120	New RfD (0.008) published.
Xylenes	-	NNS	280000	New RfD (2.0) published.
Zinc	+	28000	42000 T	The FBC standard for this toxicant is driven by the PBC standard[1]. See PBC change table.

[1]In some instances the methodology used to calculate the Full Body Contact (FBC) standard results in a value that is less stringent than the Partial Body Contact (PBC) standard. Because FBC is designed to protect submergence (or swimming) and PBC is designed to protect incidental contact with water, it is appropriate that the FBC standard be equal or more stringent than the PBC standard. If the calculation results in a FBC standard that is less stringent than the PBC standard, then the FBC standard is made equivalent to the PBC standard.

[2]In instances where the methodology used to calculate the FBC standard results in a value that is less than the Domestic Water Source (DWS) standard that is based on an MCL, the MCL is substituted for the FBC calculated standard. This approach recognizes that the MCL is designed to protect drinking water. If it is safe to drink the water, then it is safe to swim in the water.

PARTIAL BODY CONTACT				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Acrolein	+	1300	2200	EPA 1 day health advisory (ODHA) for a child[1].
Acrylonitrile	+	1400	NNS	No ODHA or RfD available to calculate standard.
Alachlor	-	NNS	1400	RfD (0.01) used to calculate standard.
Anthracene	-	NNS	42000	Error in 1992 standard calculation corrected.
Arsenic	-	2800 T	50 T	Calculated with RfD, but because MCL (50 T) is greater, it is substituted as the partial body contact standard.

PARTIAL BODY CONTACT				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
Atrazine	-	NNS	4900	RfD (0.035) used to calculate standard.
Barium	-	NNS	9800 D	RfD (0.07) used to calculate standard.
Benzene	+	470	NNS	No ODHA or RfD available to calculate standard.
BHC-gamma (lindane) (Hexachlorocyclohexane gamma)	-	2500	42	Standard based on the EPA ODHA for children.
Bis(2-ethylhexyl) phthalate (Di(2-ethylhexyl) phthalate)	-	28000	2800	Error in 1992 standard calculation corrected.
Boron	-	NNS	12600	RfD (0.09) used to calculate standard.
Carbofuran	-	NNS	700	RfD (0.005) used to calculate standard.
Carbon tetrachloride	-	8000	98	Standard based on the EPA ODHA for children.
Chlordane	-	110	8.4	Standard based on the EPA ODHA for children.
Chlorine (total residual)	-	NNS	14000	RfD (0.10) used to calculate standard.
Cyanide	-	3100 T	2800 T	Standard based on the EPA ODHA for children.
DDT	-	700	70	Error in 1992 standard calculation corrected.
1-3 Dichlorobenzene	-	13000	1880	Error in 1992 standard calculation corrected.
1,4-Dichlorobenzene	-	13000	1880	Error in 1992 standard calculation corrected.
1,1-Dichloroethane	+	14000	NNS	No ODHA or RfD available to calculate standard.
1,2-Dichloroethane	+	10000	NNS	No ODHA or RfD available to calculate standard.
2,4-Dichlorophenoxyacetic acid	-	NNS	1400	New RfD (0.01) published.
1,2-Dichloropropane	+	200	NNS	No ODHA or RfD available to calculate standard.
1,3-Dichloropropene	-	60	42	Standard based on the EPA ODHA for children.
2,4-Dimethylphenol	-	NNS	2800	RfD (0.02) used to calculate standard.
Dimethyl phthalate	-	NNS	1400000	Standard based on the EPA ODHA for children.

PARTIAL BODY CONTACT				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
2-methyl-4,6-Dinitrophenol (4,6-Dinitro-o-cresol)	-	NNS	55	Standard based on the EPA ODHA for children.
2,4-Dinitrotoluene	-	NNS	280	RfD (0.002) used to calculate standard.
Endosulfan sulfate	-	NNS	7	Standard based on the EPA ODHA for children.
Endosulfan-alpha	-	NNS	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed on IRIS for Endosulfan (Total).
Endosulfan-beta	-	NNS	Combine α&ß to Endosulfan (Total)	The stereoisomers of endosulfan (α and ß) will be combined into 1 standard and reflect the new RfD (0.006) listed on IRIS for Endosulfan (Total).
Endosulfan (Total)	-		840	See rationale for Endosulfan-alpha or -beta.
Endrin Aldehyde	-	NNS	420	Standard based on the EPA ODHA for children.
Ethylbenzene	-	64000	14000	Standard based on the EPA ODHA for children.
Fluorine	-	NNS	8400	RfD (0.06) used to calculate standard.
Heptachlor	+	20	70	RfD (0.0005) used to calculate standard.
Hexachlorobenzene	+	100	280	RfD (0.002) used to calculate standard.
Hexachlorobutadiene	+	280	NNS	No ODHA or RfD available to calculate standard.
Manganese	-	NNS	19600 T	New RfD (0.005) published.
Methoxychlor	-	NNS	700	RfD (0.005) used to calculate standard.
Methyl Chloride (Chloromethane)	+	2800	NNS	No RfD published.
Methylene chloride (Dichloromethane)	-	27000	8400	Standard based on the EPA ODHA for children.
Naphthalene	+	560	NNS	No ODHA or RfD available to calculate standard.
Nitrate	-	NNS	224000	RfD (1.6) used to calculate standard.
Nitrite	-	NNS	14000	RfD (0.1) used to calculate standard.
Selenium	+	420	700 T	RfD (0.005) used to calculate standard.
Styrene	-	NNS	28000	RfD (0.2) used to calculate standard.

PARTIAL BODY CONTACT				
Parameter	+ / -	1992 Standard	Adopted Standard March, 1996	Rationale For Proposed Standard Change
1,1,2,2-Tetrachloroethane	+	450	NNS	No ODHA or RfD available to calculate standard.
Tetrachloroethylene	-	4000	1400	Standard based on the EPA ODHA for children.
Thallium	-	3700	12 T	RfD (0.00008) used to calculate standard.
Toluene	-	42000	28000	Error in 1992 standard calculation corrected.
Toxaphene	+	1000	NNS	No ODHA or RfD available to calculate standard.
1,2,4-Trichlorobenzene	-	2800	1400	RfD (0.01) used to calculate standard.
1,1,1-Trichloroethane	+	13000	NNS	No RfD published.
2-(2,4,5-Trichlorophenoxy) proprionic acid	-	NNS	1120	RfD (0.008) used to calculate standard.
Xylenes	-	NNS	280000	RfD (2.0) used to calculate standard.
Zinc	+	28000	42000	RfD (0.3) used to calculate standard.

[1]Partial Body Contact standards calculation based on either the EPA 1 day health advisory (ODHA) for child. If the ODHA is not available, and the RfD is available, then the standard is calculated according to the RfD. If neither the ODHA or RfD are available, then No Numeric Standard (NNS) is used.

Hardness-dependent metals

There are several footnotes to Appendix A which prescribe hardness-dependent equations for deriving water quality standards for certain metals. The toxicity of these metals is dependent upon the hardness of the water. Therefore, the numeric water quality criteria for these metals are expressed as hardness-dependent equations. ADEQ revised a footnote to the equations which explains how hardness is determined. The revised footnote clarifies that it is the hardness of the receiving surface water that is used to calculate the numeric water quality criterion for a hardness-dependent metal. Also, a hardness cap of 400 mg/L as $CaCO_3$ has been imposed. The hardness cap of 400 mg/L is based upon the range of hardness values used by EPA in developing national criteria guidance recommendations for hardness-dependent metals. 40 CFR 131.36(c)(4) contains the following requirement with regard to the application of hardness-based metals criteria:

> For purposes of calculating freshwater aquatic life criteria for metals from the equations in subsection (b)(2) of this Section, the minimum hardness allowed for use in those equations shall not be less than 25 mg/L as calcium carbonate. The maximum hardness value for use in those equations shall not exceed 400 mg/L as calcium carbonate.

The rationale for the 400 mg/L hardness cap is that the data base used for the development of the §304(a) criteria guidance for hardness-dependent metals does not include data which supports extrapolation of the hardness effects of metal toxicity beyond a range of hardness of 25 mg/L to 400 mg/L.

Mercury

In the last triennial review, ADEQ established water quality standards for mercury to protect aquatic life and wildlife. ADEQ used EPA methodologies and national criteria guidance to develop the water quality criteria. The methodologies used are fully explained in Appendix B of the Concise Explanatory Statement for the water quality standards rules which was prepared to support the state's adoption of water quality standards in the last triennial review [See Attachment, "Rationale for the Development of Toxic Pollutant Criteria to Protect Aquatic and Wildlife Designated Uses" (March 13, 1996)].

ADEQ used the EPA methodology described in the national "Guidelines for Deriving Water Quality Criteria for the Protection of Aquatic Life and Its Uses [Guidelines methodology] to derive water quality criteria for mercury for the aquatic and wildlife [cold

water fishery] designated use. The Guidelines methodology calls for the calculation of a final residue value if a maximum permissible tissue concentration and at least 1 acceptable bioconcentration factor determined from an aquatic animal species is available. The Guidelines Methodology specifically states that 1 of the purposes for deriving a final residue value is to protect wildlife, including predatory birds and fishes, from demonstrated adverse effects [See 45 FR 79346 (November 28, 1980)]. ADEQ calculated a final residue value for mercury using data from EPA's national criteria document, "Ambient Water Quality Criteria for Mercury." The final residue value of 0.012 µg/L became Arizona's currently effective water quality standard to protect cold water and warm water fisheries from chronic toxicity from mercury. ADEQ also used the final residue value procedure to calculate a numeric water quality criterion to protect aquatic life and wildlife in effluent dependent waters [A&Wedw] from chronic toxicity from mercury. The recalculated numeric water quality criterion for the A&Wedw designated use was 0.2 µg/L. In adopting the mercury standard for A&Wedw, ADEQ stated:

> The proposed standard was based on toxicity to aquatic life. However, mercury has a propensity to accumulate in tissues of aquatic life to levels that may be harmful to wildlife or human consumers. These routes of exposure should be considered in developing A&W standards. The EPA publication Ambient Water Quality Criteria for Mercury - 1984 [Criteria Document] does not contain information regarding the effects of mercury on wildlife but does contain information on the effects of mercury on humans. Setting a standard based strictly on toxicity to aquatic life may not adequately protect wildlife. ADEQ recalculated the A&Wedw chronic standard for mercury using the more appropriate Final Residue Value procedure.

The use of the final residue value procedure to derive water quality criteria for the aquatic and wildlife designated uses demonstrates that Arizona considered bioaccumulative effects when it adopted the water quality standards for mercury.

On April 29, 1994, EPA disapproved the state-adopted water quality standard for mercury. EPA's disapproval of the water quality standards for mercury was based primarily on a biological opinion from the U.S. Fish & Wildlife Service [USFWS] that the state-adopted water quality standards had been developed without adequate consideration of the bioaccumulative effects of mercury on predatory wildlife. In its disapproval letter, EPA acknowledged that ADEQ had followed EPA national criteria guidance to derive water quality standards for mercury and that the currently available EPA methodology for criteria development may inadequately address food chain effects of mercury for predatory wildlife. EPA requested that ADEQ re-examine the state-adopted numeric water quality criteria for mercury in this triennial review to determine whether those criteria adequately address bioaccumulation. In making this request, EPA acknowledged that national criteria guidance for the protection of wildlife was not available and that EPA would rely on the participation of the USFWS in this triennial review to make recommendations for the adoption of numeric criteria that would be adequately protective of wildlife.

In response to this disapproval, ADEQ stated that Arizona would consider revision of its aquatic and wildlife criteria for mercury in this triennial review if national program guidance becomes available which would support the derivation of scientifically defensible criteria to protect wildlife. Such guidance is currently unavailable. In the absence of national program guidance for developing wildlife criteria, ADEQ intends to retain the currently effective water quality criteria for mercury. To address the EPA disapproval and the concerns of the USFWS, ADEQ, in cooperation with the Game & Fish Department, the USFWS, and EPA, will conduct a tissue monitoring program to evaluate the threat posed by mercury to bald eagles nesting along surface waters in Arizona. The objective of this monitoring program will be to assess the magnitude and extent of mercury bioaccumulation in the prey base of the bald eagle and other fish-eating birds. A concurrent monitoring program will be conducted by the International Boundary Water Commission in the Lower Colorado River basin to assess the bioaccumulation of mercury in the prey base of the Brown Pelican, Yuma Clapper Rail, and other fish-eating birds. These tissue monitoring programs are not designed to develop water quality criteria for mercury to protect wildlife. The purpose of the tissue monitoring program is to determine whether mercury bioaccumulation is a problem in Arizona. If mercury is found to be bioaccumulating in prey species at levels above 0.1 mg/kg, then it may be necessary to develop a more extensive sampling program to identify the contribution of mercury from different sources and to begin work on developing wildlife criteria for mercury.

Revisions to Surface Waters and Designated Uses in Appendix B

ADEQ repealed the currently effective Appendix B and replaced it with a more "user-friendly" Appendix B. Appendix B in the adopted rules has been reformatted in tabular form to enhance its readability. Appendix B includes a new location information column which provide information which will help users locate specific surface waters. The new format makes it easier to find where specific designated uses are applied to surface waters in river basins. The river basin names referenced in Appendix B have been revised to be consistent with the river basin names referenced in the biennial State Water Quality Assessment Report [§305(b) report]. This change will make it easier for ADEQ and the regulated community to link water quality standards with the water quality assessment information contained in the §305(b) report. The surface waters that are specifically listed in Appendix B have been updated to reflect new knowledge gained about those surface waters since the last triennial review. Also, Appendix B was revised by deleting all surface waters that are located on tribal lands. The state has no jurisdiction over such surface waters and cannot prescribe water quality standards for them.

The other major revisions to Appendix B are in response to a specific EPA disapproval of the state-adopted water quality standards. On September 9, 1993, EPA disapproved the lack of the fish consumption designated use [FC] for certain surface waters listed in Appendix B. EPA notified the state that, in order to be in compliance with §101(a)(2) of the Clean Water Act and 40 CFR 131.10(a), the state would have to either: 1) designate the fish consumption designated use for all surface waters that did not have that designated use in Appendix B; or 2) provide use attainability analyses [UAAs] to justify the omission of the fish consumption designated use. In its disapproval letter, EPA indicated that UAAs for categories of surface waters were acceptable as long as the methods used by the state were scientifically and technically supportable. An example of this type of a categorical UAA would be a UAA for ephemeral waters based upon the low flow factor prescribed at 40 CFR 131.10(g)(2) and R18-11-104(H)(1).

EPA also indicated that the state could choose to conduct a 2-tiered use attainability analysis to justify the omission of the fish consumption designated use in effluent dependent waters. The 1st tier of the UAA analysis would consist of the presentation of evidence presently available to ADEQ that there is no fishing in the effluent dependent waters. The 2nd tier of the UAA would be triggered by the receipt of an application for resilience of an NPDES permit for the point source discharge which creates the effluent dependent water. The 2nd tier would be a more in-depth analysis to confirm that the fish consumption designated use is not attainable.

ADEQ submitted a categorical UAA for ephemeral waters to justify the omission of both the full body contact and fish consumption designated uses based upon low flow to EPA [dated August 18, 1995]. ADEQ also conducted the Tier 1 analysis referenced above to justify omission of the fish consumption designated use in effluent dependent waters [dated July 20, 1995]. Both of these UAAs were approved by EPA on November 20, 1995. Consequently, the proposed Appendix B does not include any new fish consumption designated uses for ephemeral waters or effluent dominated waters.

ADEQ added the fish consumption designated use [FC] to any surface water with either the aquatic and wildlife [cold water fishery] or aquatic and wildlife [warm water fishery] designated use. The fish consumption designated use was added to the following surface waters previously listed in Appendix B:

Bill Williams River Basin: Peeple's Canyon Creek

Colorado Main Stem River Basin: Jacob Lake, Lonetree Canyon Creek, Red Canyon Creek, Sawmill Canyon, and Warm Springs Creek.

Little Colorado River Basin: Boot Lake, Camillo Tank, Chilson Tank, Cow Lake, Crisis Lake [Snake Tank #2], Daves Tank, Deep Lake, Horse Lake, Long Lake - upper, Mud Lake, Pine Tank, Potato Lake, Puerco River, Rogers Reservoir, Sponseller Lake, Vail Lake, and Zuni River.

Lower Gila River Basin: Gila River [Painted Rock Dam to the Colorado River]

Middle Gila River Basin: Agua Fria River [Below State Highway 85], Antelope Creek, Beehive Tank, Black Canyon Creek, Centennial Wash Ponds, Hassayampa Lake, Lynx Creek, Painted Rock Reservoir, Perry Mesa Tank, Queen Creek [headwaters to the Superior Mining Division discharge outfall], Queen Creek [Potts Canyon to El Camino Viejo Road], and Turkey Creek.

Rios de Mexico Basin: Abbot Canyon, Blackwater Draw, Buck Canyon, Dixie Canyon, Dry Canyon, Gadwell Canyon, Glance Creek, Gold Gulch, Holden Canyon Creek, Johnson Canyon, Mexican Canyon, Mule Gulch [Headwaters to Bisbee WWTP], Soto Canyon, and Sycamore Canyon Creek.

Salt River Basin: Coon Creek, Gold Creek, and Salt River [I-10 to 23rd Avenue].

San Pedro River Basin: Buehman Canyon Creek, Copper Creek [Headwaters to Prospect Canyon], Garden Canyon Creek, San Pedro River [Redington to the Gila River], and Turkey Creek.

Santa Cruz River Basin: Agua Caliente Wash [headwaters to Coronado National Forest boundary], Arivaca Creek, Bog Hole Tank, Cienega Creek [headwaters to I-10], Cienega Creek [I-10 to Del Lago Dam], Cienega Creek [below Del Lago Dam], Empire Gulch [below Empire Ranch Spring], Gardner Canyon Creek, Harshaw Wash [headwaters to Corral Canyon confluence], Huachuca Tank, Santa Cruz River [International Boundary to Nogales WWTP outfall], Soldier Lake, Sonoita Creek [1 kilometer below State Highway 82 bridge to Town of Patagonia WWTP outfall], Tanque Verde Creek [headwaters to Wentworth Road], and Williams Ranch Tanks.

Upper Gila River Basin: Apache Creek, Bitter Creek [headwaters to Jerome WWTP], Chase Creek, Evans Pond, Markham Creek, and Pigeon Creek.

Verde River Basin: Aspen Creek, Barrata Tank, Bitter Creek [headwaters to Jerome WWTP], Bitter Creek [below 2.5 km downstream of Jerome WWTP], Fossil Springs, Foxboro Lake, Granite Creek, Horse Park Tank, Meath Dam Tank, and Willow Valley Lake.

Willcox Playa: High Creek and Willcox Playa.

Repeal of Appendix C: Practical Quantitation Limits

ADEQ repealed Appendix C to address a specific EPA disapproval [See previous discussion of practical quantitation limits].

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 summary of the economic, small business and consumer impact:**

   In general, ADEQ believes that the water quality standards rules will have a little or no economic impact, with the exception of the adopted rule which classifies Buehman Canyon Creek as a unique water [See discussion below]. The majority of the proposed revisions to the rules are editorial changes. Substantive revisions to the water quality standards that may have a minimal economic impact include the following:

   1. The revision of the waste treatment system exclusion language;
   2. The adoption of the net ecological benefit rule;

3. The adoption of the *E. coli* water quality standards for the full body contact designated use;
4. The repeal of the water quality criteria for turbidity for the full-body contact and partial-body contact designated uses;
5. The adoption of diurnal standards for dissolved oxygen in effluent dependent waters.
6. The unique waters classifications, particularly the Buehman Canyon Creek nomination;
7. The adoption of the variance rule;
8. The revision to the numeric water quality criteria to protect the domestic water source, fish consumption, full body contact and partial body contact designated uses;
9. The addition of the fish consumption designated use to surface waters that are cold water or warm water fisheries which currently do not have the designated use.

Each of these potential economic impacts is discussed below. Probable economic impacts are characterized qualitatively, except for the discussion of the economic impact of the unique waters classification of Buehman Canyon Creek. The qualitative descriptions include a discussion of the persons who may be directly affected by the rule, the probable costs and benefits associated with adoption and implementation of the rule change, a description of the probable impact of the revision on private and public employment, and a description of the probable impact of the revisions on small businesses, private persons, and consumers. None of the proposed rules to the water quality standards rules are expected to have an effect on state revenues, with the possible exception of the unique waters classification of Buehman Canyon Creek.

Persons who may be directly affected by, bear the costs of, or directly benefit from the adopted water quality standards rules include the following:

1. Owners of wastewater treatment plants and other point source discharges to surface waters in Arizona;
2. Municipalities serving populations of 100,000 or more and urbanized counties with populations in unincorporated areas with populations of 100,000 or more that are required to obtain NPDES permits for discharges from their separate storm sewer systems;
3. State agencies and political subdivisions which operate wastewater treatment plants which discharge to surface waters in Arizona;
4. Mines and mineral exploration companies; and
5. Members of the general public.

Effect on the Arizona Department of Environmental Quality

The adopted rules will have little or no impact on ADEQ. ADEQ anticipates no change in staff levels or payroll as a result of the adoption and implementation of the rules. Two of the adopted rules may result in additional costs for ADEQ. Two adopted rules create new procedures which permit: 1) the modification of a water quality standard on the ground of net ecological benefit; and 2) discharger-specific variances. Implementation of the adopted rule on variances may result in additional costs for the agency associated with technical and legal review of variance requests and public participation procedures. Implementation of the net ecological benefit rule may result in an increase in petitions for rulemaking. The adopted rule provides the authority to modify a water quality standard, by rule, on grounds of net ecological benefit. Owners of wastewater treatment plants may submit petitions for rulemaking to modify water quality standards on this ground. ADEQ cannot predict how many persons may take advantage of these 2 adopted rules and either request a variance or seek a modification of a water quality standard.

Effect on Other State Agencies and Political Subdivisions

The adopted rules may affect state agencies and political subdivisions as owners of NPDES-permitted facilities. Counties, municipalities, federal and state agencies, and sanitary districts operate wastewater treatment plants which discharge to surface waters in Arizona that are subject to water quality standards. The point source discharge of pollutants from wastewater treatment plants to surface waters are regulated by NPDES permits. A NPDES permit may contain water quality-based discharge limitations which are designed to ensure that the discharge from the point source to the surface water complies with applicable water quality standards. Any revision to the applicable water quality standards may affect a point source through the NPDES permit which limits the discharge of pollutants from that point source. New monitoring requirements or revised discharge limitations may be placed in a NPDES permit because the applicable water quality standards for the receiving surface water have been revised.

In general, ADEQ believes that the revisions to the water quality standards rules will have little or no economic impact on other state agencies and political subdivisions which own and operate point source discharges to surface waters. The only revisions to the water quality standards which may result in revisions to NPDES permits are the following: 1) the adoption of *E. coli* water quality criteria for surface waters with the full body contact designated use; 2) the adoption of more stringent water quality criteria for the domestic water source, fish consumption, full body contact, and partial body contact designated uses to protect human health; and 3) the adoption of the fish consumption designated use for certain surface waters in Arizona. The economic impact of each of these revisions is discussed separately below.

It should be noted that a revision of state-adopted water quality standards may have an impact on municipalities with populations greater than 100,000 and counties with populations in unincorporated urbanized areas greater than 100,000 which operate separate storm sewer systems. In Arizona, this initially includes Pima County and the cities of Phoenix, Tucson, Mesa, and Tempe. These

political subdivisions are required to obtain NPDES permits for discharges of storm water from their municipal separate storm sewer systems [MS4] to surface waters. EPA is the NPDES MS4-permitting authority in Arizona. EPA has acknowledged that substantial costs are potentially associated with the control of the discharge of pollutants in storm water to achieve compliance with water quality standards. Initially, the NPDES MS4 program will focus on the implementation of best management practices or non-structural source controls to reduce the discharge of pollutants in storm water. Consequently, the draft NPDES MS4 permits do not include water quality-based discharge limitations and the revision of the state-adopted water quality standards in this triennial review has no short term economic impact. However, EPA has stated that additional discharge controls may be needed over the long term to achieve compliance with state-adopted water quality standards, depending upon the success of nonpoint source control efforts. ADEQ acknowledges that while the adopted rules will not have a short-term economic impact on political subdivisions, there is a possibility of a substantial, long-term economic impact for political subdivisions if numeric discharge limitations that are necessary to achieve compliance with state-adopted water quality standards are written into NPDES MS4 permits in future permit cycles.

Effect on Businesses

With the possible exception of the unique waters classification of Buehman Canyon Creek, the adopted rules will have no impact on businesses in the private sector. There are a small number of point source discharges to surface waters that are owned by businesses in the private sector [e.g., electric utilities, point source discharges from mines]. NPDES-permitted facilities that are owned by businesses in the private sector may be affected in the same way that NPDES-permitted facilities owned by political subdivisions are affected. Again, the only revisions to the water quality standards in the which may result in revisions to NPDES permits for point sources that are owned by businesses in the private sector are the following: 1) the adoption of *E. coli* water quality criteria for surface waters with the full body contact designated use; 2) the adoption of more stringent water quality criteria for the domestic water source, fish consumption, full body contact, and partial body contact designated uses to protect human health; and 3) the adoption of the fish consumption designated use for certain surface waters in Arizona.

It should be noted that the Clean Water Act requires that NPDES permits be issued for stormwater discharges that are associated with industrial activity. Surface water quality may be adversely affected by stormwater discharges through contact with industrial areas. Again, EPA is the NPDES stormwater permitting authority for industrial facilities in Arizona. By monitoring and regulating stormwater discharges from industrial facilities under the NPDES program, EPA hopes to control and reduce industrial stormwater pollution, and, in turn, reduce the loading of pollutants to receiving surface waters which are subject to state-adopted water quality standards. Achieving the long-term goal of protecting surface water quality from industrial stormwater discharges requires a phased approach. EPA has developed a 4-tier set of priorities for issuing NPDES stormwater permits for industrial facilities, starting with general permits and over time addressing watershed permits, industrial category-specific permits, and facility-specific permits. Ultimately, some industrial facilities may be required to implement pollution control systems based on best available technology or water quality standards.

Initially, EPA has issued general permits which cover most industrial facilities in Arizona. The most important component of these general permits is the development of a pollution prevention plan. Basically, these pollution prevention plans require that industrial dischargers identify the source of pollutants in stormwater runoff from their facilities and then develop and implement a plan to reduce the pollutants in the runoff. The key elements of the pollution prevention plan include preventive maintenance, good housekeeping, spill prevention and response, sediment and erosion prevention, employee training, inspection of facilities, and recordkeeping. Permittees also must consider appropriate structural control measures such as storm water detention basins, oil and grit separators, infiltration devices, the use of vegetated swales, and stormwater runoff diversion structures. In general, the general permits for industrial facilities require the implementation of best management practices thought to be appropriate for all industrial stormwater dischargers.

The adopted rules will have no short-term economic impact on businesses which are required to control stormwater runoff from their industrial facilities because EPA is initially requiring the implementation of best management practices in NPDES general permits. However, like the NPDES MS4 permits, there is a possibility that the baseline general permits may prove to be inadequate or inappropriate for all industrial facilities to achieve compliance with state-adopted water quality standards. There is the possibility of a substantial, long-term economic impact for businesses if numeric discharge limitations are deemed necessary to achieve compliance with state-adopted water quality standards and such permit conditions are written into individual NPDES permits for industrial facilities in future NPDES stormwater permit cycles.

Effect on Private and Public Employment

With the exception of the classification of Buehman Canyon Creek as a unique water, the adopted water quality standards should have no effect on private and public employment.

Effect on Small Businesses

With the exception of the classification of Buehman Canyon Creek as a unique water, the adopted rules will have no short term economic impact on small businesses. To the extent that small businesses own and operate point source discharges to surface waters, the adopted rules will affect them like political subdivisions and other state agencies that own and operate point source discharges. However, this impact is minimal. Small businesses that are required to control stormwater discharges from industrial facilities are affected by NPDES stormwater permitting regulations. The state-adopted water quality standards may be used as a basis for NPDES permit conditions for industrial facilities that may be owned and operated by small businesses as defined by A.R.S. § 41-1001(20). However, since most industrial facilities in Arizona will be regulated initially under general permits which focus on the implementation of best management practices to achieve compliance with water quality standards, it is expected that the adopted rules will not have a short-term economic impact.

Effect on Consumers

The adopted rules will have no economic impact on consumers.

Probable Effect on State Revenues:

With the possible exception of the classification of Buehman Canyon Creek as a unique water, the adopted rules will have no effect on state revenues.

Economic Impact of the Revision of the Waste Treatment System Exclusion

The revision of the language of the waste treatment system exclusion will benefit persons who own or operate wastewater treatment plants. Counties, municipalities, sanitary districts, and others who own and operate wastewater treatment plants are the primary beneficiaries of the proposed rule revision. The proposed revision also may benefit industrial facilities which utilize lagoons or impoundments for industrial wastewater treatment [e.g. utilities which utilize cooling ponds, fly ash ponds, or blowdown ponds]. The adopted rule clarifies that waste treatment systems, including treatment ponds and lagoons that are a part of such treatment systems, are not "surface waters" or "waters of the United States" and are not subject to water quality standards. The adopted rule repeals language which restricts the location of such wastewater treatment systems.

The adopted rule removes a regulatory barrier to the construction of in-channel waste treatment systems. In particular, the revision provides more flexibility under the water quality standards program for the construction of wetlands to provide "natural" wastewater treatment in dry watercourses. In many cases, constructed wetlands are a cost-effective method of wastewater treatment and disposal. The adopted rule will benefit the owners and operators of wastewater treatment plants by providing a cost-effective wastewater treatment and disposal option.

Economic Impact of the Proposed Adoption of the E. coli Water Quality Standards for Surface Waters With the Full Body Contact Designated Use

The adoption of *E. coli* water quality criteria for the full body contact [FBC] designated use will affect point source dischargers who discharge treated wastewater to surface waters with the FBC designated use. This revision will primarily affect wastewater treatment plants. If the new *E. coli* water quality criteria become effective, the standards will eventually be incorporated as water quality-based discharge limitations in the NPDES permits for wastewater treatment plants which discharge to surface waters with the FBC designated use.

The monitoring costs for those point source dischargers will increase because they will be required to monitor the discharge of effluent for the presence of *E. coli*. ADEQ expects that the increase in the cost of monitoring will be minimal. Information gathered from the Department of Health Services [ADHS] indicates that the increased cost of *E. coli* monitoring is minimal. The additional cost for samples submitted to ADHS laboratories is $2 - $3/sample. For smaller laboratories the increased cost may be greater, but no more than $10/sample. Assuming that a wastewater treatment plant is required to conduct monitoring for *E. coli* twice a month, the predicted increase in monitoring costs could be as little as $50/year to as much as $240/year.

It is not known how many point source dischargers will be affected by this increase in monitoring costs. As of June 30, 1995, there were only 157 NPDES permitted-facilities in Arizona. Of these, 14 are located on Indian lands and are not affected by the adoption of *E. coli* standards by the state. Not all of the remaining 143 NPDES-permitted facilities discharge to surface waters with the FBC designated use. Approximately 30 wastewater treatment plants discharge to effluent dependent waters which do not have the FBC designated use. The remaining number of wastewater treatment plants is probably less than 100. ADEQ reviewed the NPDES permit files of approximately 25% of the point source discharges in Arizona. Of the NPDES permits reviewed, approximately 50% discharged to a surface water that was protected with the FBC designated use. If this proportion is applied to all potential NPDES-permitted facilities, then it is likely that 55 to 60 facilities may be affected by the increased cost of monitoring for *E. coli*. Assuming that 60 NPDES-permitted facilities are affected by the increase in monitoring costs for *E. coli,* then the estimated increase in the total annual cost of monitoring for all facilities in the state ranges from $3000/year to $14,400/year.

State or county agencies may conduct monitoring activities as part of their management of public swimming areas [e.g., Arizona State Parks or County Health Departments]. The amount of the increased cost of monitoring for *E. coli* depends upon the sampling frequency. However, because *E. coli* is a better indicator of swimming-associated gastrointestinal illness than fecal coliform, there are public health benefits associated with *E. coli* monitoring. Water quality managers can make better informed decisions about whether closures of public swimming areas in Arizona surface waters are necessary if *E. coli* monitoring is performed.

Economic Impact of the Adoption of the Net Ecological Benefit rule

The net ecological benefit rule permits a modification of a water quality standard for an effluent dependent water. An effluent dependent water is a surface water whose flow consists primarily of treated wastewater. Thirty-five surface waters in Arizona have been classified as effluent dependent waters. Thus, the adopted rule may provide a benefit to the owners of 35 wastewater treatment plants in Arizona.

In many cases, the discharges of effluent from these 35 wastewater treatment plants create or support ecologically valuable aquatic, wildlife, and riparian habitats along watercourses that would otherwise be dry or nearly dry. The adopted rule creates regulatory flexibility to allow the modification of a water quality standard which applies to an effluent dependent water when necessary to preserve and maintain the in-stream flow of effluent which creates or supports an ecologically valuable aquatic, wildlife, or riparian habitat.

Because there is little or no dilution for a point source discharge of effluent which creates an effluent dependent water, the source

wastewater treatment plant often has to meet applicable water quality standards at the "end-of-the-pipe." Where a water quality cannot be met or where the cost of meeting a water quality standard is very high, the owner of the wastewater treatment plant may consider alternatives to discharging effluent to the surface water. Examples of alternatives to discharging effluent include total reuse of the effluent or groundwater recharge. High treatment costs associated with achieving compliance with an applicable water quality standard may discourage the continued discharge of treated wastewater which supports an effluent dependent ecosystem. The elimination of the discharge of effluent may result in the complete destruction of the effluent dependent ecosystem.

Under the adopted rule, the owner of a wastewater treatment plant which creates an effluent dependent water may, under certain conditions, obtain a modification of a water quality standard. The adopted rule permits the modification of a water quality standard where the owner of a wastewater treatment plant demonstrates that a modification is justified because the value of providing treated wastewater to create or support an effluent dependent ecosystem [even under a modified water quality standard] outweighs the environmental cost associated with the elimination of the discharge of effluent and the complete destruction of the effluent dependent ecosystem.

The adopted rule provides a benefit to the owners of wastewater treatment plants that support or create effluent dependent waters because it provides a mechanism for relief from a water quality standard that otherwise might force costly treatment plant upgrades. The adopted rule also provides ecosystem benefits in that it provides a regulatory incentive to maintain and preserve in-stream flows in areas where riparian and aquatic resources are limited. The continued discharge of effluent may provide net ecological benefits, even though an applicable water quality standard is not being met. Examples of possible ecological benefits include:

1. Enhancement, expansion, or restoration of aquatic and riparian habitat for native, threatened, or endangered aquatic species, or for migratory waterflow;
2. Provision or enhancement of habitat or food sources for native, threatened, and endangered species that are terrestrial;
3. Enhancement of species diversity; and
4. Enhancement or restoration of riparian values [e.g., cottonwood/willow habitat, improved bird, and wildlife habitat];

ADEQ cannot predict how many owners of wastewater treatment plants may request a modification of a water quality standard on the ground of net ecological benefit. However, it is expected that there will be few such requests. Currently, there are only 35 effluent dependent waters in the state and the wastewater treatment plants which create these effluent dependent waters are not encountering difficulty in complying with applicable water quality standards. ADEQ is aware of only 2 municipalities in the state, the cities of Phoenix and Nogales, that have considered zero discharge options for their wastewater treatment plants because of the potential high cost of treatment upgrades necessary to achieve compliance with applicable water quality standards.

Economic Impact of the Proposed Repeal of the Water Quality Criteria Turbidity for the Full Body Contact and Partial Body Contact Designated Uses

ADEQ repealed the water quality criteria for turbidity for the full-body contact and partial-body contact designated uses. The repeal of the turbidity criteria will affect ephemeral waters and land use activities which occur around them. The practical result of the repeal of the turbidity criteria for the partial-body contact designated use is that turbidity standards will not apply to ephemeral waters in Arizona.

The repeal of water quality criteria for turbidity in ephemeral waters may benefit urbanized counties and municipalities that are regulated under NPDES stormwater permits. The repeal of the water quality criteria for turbidity for the partial-body contact and full-body contact designated uses eliminates the possibility that NPDES permits for stormwater discharges to ephemeral waters may include water quality-based discharge limitations for turbidity. It should be noted that the draft NPDES stormwater permits for municipal storm sewer systems do not include any water quality-based discharge limitations. Thus, the repeal of the water quality criteria for turbidity will have no short-term effect on NPDES-permitted stormwater discharges in the short term [i.e., in the 1st NPDES permit cycle of 5 years]. The repeal may provide a benefit if water quality-based discharge limitations are incorporated into reissued NPDES stormwater permits in future permit cycles.

Economic Impact of the Proposed Diurnal Standard for Dissolved Oxygen in Effluent Dependent Waters

ADEQ adopted a more stringent, diurnal dissolved oxygen standard for effluent dependent waters. The adopted daytime standard for dissolved oxygen in an effluent dependent water is 3.0 mg/L. The currently effective dissolved oxygen standard is 1.0 mg/L. The adopted standard may affect approximately 35 wastewater treatment plants which create effluent dependent waters in Arizona. While the dissolved oxygen standard which applies during the daytime is more stringent, it should have no impact on wastewater treatment plants. Data collected by ADEQ shows that effluent dependent waters currently meet or exceed the more stringent daytime dissolved oxygen standard. Dissolved oxygen concentrations in effluent dependent waters range from 1.0 mg/L during the night to 12 mg/L during the daytime hours. Effluent dependent waters may become super-saturated with oxygen during the daytime because of the amount of photosynthetic production of oxygen by aquatic plants. Thus, the adopted dissolved oxygen standard will not force any wastewater treatment plant to upgrade treatment.

Economic Impact of the Proposed Variance Provision

The adopted rule provides a mechanism for obtaining a variance from water quality standards. The proposed variance is discharger-specific. Thus, the only persons who may be directly affected by the proposed rule are point source dischargers to surface waters. The proposed rule provides a benefit to dischargers because it provides a way for the discharger to obtain short-term relief from compliance with a water quality standard if compliance is not technically or economically feasible. The adopted rule allows a

specific discharger to avoid the high cost of upgrading treatment where it can be demonstrated that imposing such cost would have a substantial and widespread economic and social impact.

Economic Impact of Proposed Revisions to Numeric Water Quality Criteria

ADEQ adopted revisions to the numeric water quality criteria for the domestic water source, fish consumption, full body contact, and partial body contact designated uses. These revisions may affect point source dischargers that discharge pollutants to surface waters with those designated uses. For example, revisions to the water quality criteria for the domestic water source designated use will affect only those point source dischargers that discharge to a surface water with that designated use. In most cases, the point source dischargers who are affected are domestic and municipal wastewater treatment plants. The revision to an applicable water quality standard may result in a change in a discharge limitation in a NPDES permit for a wastewater treatment plant or a new monitoring requirement.

The majority of the revisions to the numeric water quality criteria result in less stringent criteria. The adoption of a less stringent water quality criterion will have no economic impact on any point source discharger. However, in some cases, the revision results in a more stringent water quality criterion. In such cases, there is a possibility that a point source discharger may be required to upgrade treatment to ensure compliance with the more stringent water quality standard. A treatment upgrade would be required only if a discharge contains the pollutant in a concentration that would result in a violation of the more stringent water quality standard. Again, it is unlikely that more stringent water quality criteria adopted by ADEQ will affect point source dischargers because, in most cases, the more stringent water quality standards are for pollutants that are not typically found in effluents and point source dischargers are not required to conduct routine monitoring for them.

A number of the changes in the water quality criteria, especially for the PBC designated use, result in a change from a water quality criterion of "no numeric standard [NNS]" to a numeric water quality criterion. If it is determined that a permitted facility should monitor for 1 of these parameters, then the result could be additional monitoring costs.

For the domestic water source designated use, ADEQ revised the water quality criteria for 8 pollutants to be more stringent. These pollutants are: boron, 1,3-dichloropropene, manganese, mercury, nickel, pentachlorophenol, 1,2,4-trichlorobenzene and zinc.

For the fish consumption designated use, ADEQ revised the water quality criteria for 6 pollutants to be more stringent. These pollutants are: cadmium, 1,3-dichloropropene, pentachlorophenol, thallium, 1,2,4-trichlorobenzene and zinc.

For the full body contact designated use, ADEQ revised the water quality criteria for 21 pollutants to be more stringent. These pollutants are: boron, carbofuran, total residual chlorine, cyanide, 1,2-dibromomethane, 2,4-dichlorophenoxyacetic acid, 1,3-dichloropropene, 2,4-dimethylphenol, dimethyl phthalate, 2-methyl-4,6-dinitrophenol, ethylbenzene, manganese, nitrate, nitrite, pentachlorophenol, styrene, thallium, toluene, 1,2,4-trichlorobenzene, 2-(2,4,5-trichlorophenoxy) propionic acid and xylenes.

For the partial body contact designated use, ADEQ revised the water quality criteria for 30-7 pollutants to be more stringent: alachlor, anthracene, arsenic, atrazine, barium, BHC-gamma, bis (2-ethylhexyl) phthalate, boron, carbofuran, carbon tetrachloride, chlordane, chlorine, cyanide, DDT, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 2,4-dichlorophenoxyacetic acid, 1,3-dichloropropene, 2,4-dimethylphenol, dimethyl phthalate, 2-methyl-4,6-dinitrophenol, 2,4-dinitrotoluene, endosulfan sulfate, endrin aldehyde, ethylbenzene, fluoride, manganese, methoxychlor, methylene chloride, nitrate, nitrite, tetrachloroethylene, thallium, toluene, 1,2,4-trichlorobenzene, 2,4,5-TP, and xylenes.

Surface waters in Arizona have multiple designated uses. Where there is more than 1 designated use and multiple water quality criteria apply to a surface water, the most stringent water quality criterion applies. For example, the water quality criteria for the full body contact designated use may be less stringent than the water quality criteria that have been established to maintain and protect water quality for other designated uses. Thus, even where ADEQ revised the full-body contact criterion to be more stringent, it may have no economic impact because other applicable water quality criteria are more stringent. In general, the water quality criteria for the full body contact and partial body contact designated uses are less stringent than the water quality criteria that have been established for the domestic water source, fish consumption, and aquatic and wildlife designated uses. Consequently, the revision of the full-body contact and partial-body contact water quality criteria will have no economic impact in terms of a facility requiring upgrades in treatment capabilities to meet the water quality criteria. However, because many of the changes to the partial body contact criteria result in the establishment of a water quality standard rather than NNS, there is the potential for increased monitoring costs for facilities that may be required to monitor for compliance with new criteria.

The majority of large NPDES-permitted facilities are required to monitor for a routine set of 16 chemicals. Small facilities have an even more limited set of chemicals to monitor. Only in special cases, where there is a reasonable potential for a chemical to be present in the waste stream, will a facility have discharge limitations in their permit for chemicals other than the 16 routine chemicals.

Two approaches were undertaken to evaluate the impact of changes in the water quality criteria for the 16 chemicals that are routinely monitored by existing NPDES-permitted facilities. The 1st approach was to look at a subset of existing NPDES permits. Thirty-2 of 143 NPDES or ca. 23% of the existing NPDES permits were reviewed. Six facilities were found that could be required to have more stringent discharge limitations put into their permit. However, for all 6 facilities a review of their discharge monitoring reports showed that the facility was already discharging treated wastewater that met the new standard. A review, then, of almost 1 quarter of existing permits showed that the changes in water quality criteria for routinely monitored chemicals would have no impact on the facilities.

The 2nd approach used to evaluate the impact of changes to the numeric water quality criteria was to look at the effect of a change in the water quality standard in the context of all other designated uses. This approach is useful since the discharge limitations

placed in NPDES permits are based on the most stringent designated use that is applied to the water body receiving the discharge. This review showed that of the 16 chemicals routinely monitored, modifications in the numeric criteria for 7 of them (antimony, beryllium, cadmium, cyanide, mercury, selenium, and zinc) have no impact on NPDES permits as other designated uses (usually aquatic and wildlife criteria) are protected by more stringent criteria. Of the remaining 9 chemicals, changes in the water quality criteria for 6 chemicals (barium, boron, chlorine, manganese, nitrate, and nitrite) could result in increased monitoring costs as these chemicals previously had no numeric standard, but now with a numeric standard could be placed in permits with a discharge limitation. Because the requirement to monitor for any of these 6 chemicals depends on the nature of the facility, the waste stream, and the designated uses of the receiving water body, it was not possible to evaluate an average additional cost per facility. However, in no case is it believed that any of the new discharge limitations would be difficult for a NPDES- permitted facility to meet. The 3 remaining chemicals (arsenic, nickel, and thallium) are more stringent in specific ways. However, in the review of almost 1 quarter of existing NPDES permits no compliance problems were identified as a result of these changes.

With regards to arsenic, it should be noted that the adopted rules include a change of the fish consumption arsenic standard from 3.1 µg/L to 1450 µg/L. In parts of the state, the 3.1 µg/L standard is below natural background levels for arsenic, especially in the Verde and Lower Salt River basins. The result was the potential for significant compliance problems for dischargers. The considerably less stringent adopted standard results from the reclassification of arsenic in fish tissue from a carcinogen to a non-carcinogen. This change is expected to benefit many point source dischargers. In addition to changes in the water quality criteria for routinely monitored chemicals, many changes (both more and less stringent) also occurred for chemicals for which NPDES permitted facilities do not have to routinely monitor.

Economic Impact of Proposed Addition of Fish Consumption Designated Uses

The addition of the fish consumption designated use to surface waters that are identified as cold water or warm water fisheries has the potential to result in new discharge limitations or monitoring requirements for point source dischargers who discharge to surface waters with the added use. ADEQ has determined that only 1 existing NPDES-permitted facility discharges to a water body that had the fish consumption use added. A review of the discharge limitations in this facility's NPDES permit showed that the additional use would result in no additional monitoring cost or more stringent discharge limitations.

Economic Impact of Proposed Unique Waters Designations

Three surface waters are classified as unique waters in the adopted rules. The classification of a surface water as a unique water results in a high level of water quality protection for that surface water. In general, the water quality standards rules require that existing water quality in a unique water be maintained and protected. No degradation of existing water quality in a unique water is allowed.

Two of the new unique waters are located in federal wilderness areas that will remain undeveloped. For this reason, the unique waters classifications for Aravaipa Creek and the Cave Creek watershed are expected to have no economic impact. The 3rd unique water, Buehman Canyon Creek, is located on public lands managed by U.S. Forest Service and on private lands. The classification of Buehman Canyon Creek as a unique water may have a significant economic impact. Because ADEQ classified Buehman Canyon Creek as a unique water, any land use activities within the Buehman Creek Canyon watershed are given strict scrutiny under the antidegradation provisions of the water quality standards rules. Any land use activity in the watershed which will degrade water quality in Buehman Canyon Creek would be prohibited.

A mineral exploration company, Keystone Minerals, Inc., holds unpatented mining claims in the Buehman Canyon Creek watershed. Representatives of Keystone Minerals, Inc. submitted oral and written public comments to ADEQ opposing the classification of Buehman Canyon Creek as a unique water during the public comment period, stating that the classification of Buehman Canyon Creek would preclude the development of a copper mine in the watershed. Keystone Minerals claimed that there are 23,562,000 tons of minable copper ore reserves which can be extracted through open pit mining and heap leaching at the Korn Kob mine site in Buehman Canyon. In addition, Keystone Minerals, Inc. estimated that an additional 50,000,000 tons of ore reserves were present which could be extracted through in situ mining. Keystone Minerals, Inc. argued that the economic benefits associated with the development of the copper mine would be lost if Buehman Canyon Creek was designated as a unique water.

The economic feasibility of developing a copper mine at the Korn Kob Mine site in Buehman Canyon was questioned by other commenters. ADEQ received comments on the history of mining exploration in Buehman Canyon. Apparently, there has been low scale, intermittent mining at the Korn Kob mine site since the turn of the century. Most of this mining activity has been exploratory drilling and test drilling for feasibility studies. Over the last decade, Phelps Dodge Corp., Newmont Mining Corp., A.F.Budge Mining Limited, and Gold Giant Minerals, Inc. have conducted exploratory drilling. Each of these companies determined that large-scale mining at the Korn Kob Mine site was not economically feasible. Most recently, Gold Giant Minerals, Inc., and Corner Bay Minerals, Inc., 2 Canadian mining companies, decided not to develop a copper mine at the site because the copper grade of ore at the site does not meet the economic criteria of their companies.

ADEQ staff developed a revenue projection model using economic data submitted by Keystone Minerals, Inc. The economic analysis assumes that a copper mine is developed in Buehman Canyon. Revenue modeling for copper mining yield direct impacts of between $20 to $24 million annually or a conservative estimate of $200 million over 10 years, the life expectancy of the Korn Kob Mine. If the Korn Kob Mine becomes operational, Keystone Minerals, Inc., estimates that a mining contractor would be used to mine the copper ore and operate the heap leaching pads with a payroll of 64 people. The operation of a solvent extraction and electrowinning plant would employ between 20 and 26 people. The total annual payroll is estimated by Keystone Minerals, Inc., to be $895,000. Keystone Minerals, Inc., estimates that initial capital expenditures to develop the Korn Kob Mine and build a solvent extraction and electrowinning plant will be approximately $15 million. Keystone Minerals, Inc., estimates that expected annual operating costs will be $11.3 million, based on the feasibility study's "optimum" case scenario. Keystone's optimum scenario

assumes the mining of about 2.7 million tons of ore per year with an annual production estimate of 16.7 million pounds of marketable copper. Keystone Minerals, Inc. projected that up to 25% of its net revenues would be payable in taxes and royalty payments to all levels of government.

ADEQ contracted with economists from Thomas, Warren, and Associates to provide an economic analysis of the classification of Buehman Canyon Creek as a unique water. This economic analysis was attached as an appendix to the final economic impact statement for this rulemaking. The report provides an analysis of the recreational, nature-based or ecotourism, preservation, and ecological service values associated with classifying Buehman Canyon Creek as a unique water. Also attached were the following: a summary of the economic costs and benefits of the Buehman Canyon Creek nomination by Dr. Bonnie G. Colby; a report entitled "Rural Arizona...The Economic Benefits of Recreation," Arizona State Parks Board, Statewide Planning Section; and the final report of a study entitled "Nature-based Tourism and the Economy of Southeastern Arizona: Economic Impacts of Visitation to Ramsey Canyon Preserve and the San Pedro Riparian Conservation Area," by Kristine Crandall, et.al, Department of Agricultural and Resource Economics, University of Arizona, Tucson, Arizona [October 30, 1992]. These documents provided a compelling economic argument for the classification of Buehman Canyon Creek as a unique water. Recreational and ecotourism activities alone are estimated to generate between $59 and $64 million annually, or a conservative estimate of $590 million over a decade. ADEQ has concluded that the probable benefits of designating Buehman Canyon Creek as a unique water outweigh the probable costs.

The unique waters classification of Buehman Canyon Creek does not necessarily preclude mining in Buehman Canyon. However, it would preclude the development of any mine in a manner which would degrade water quality in Buehman Canyon Creek. Also, the classification of Buehman Canyon Creek as a unique water may make the development of any mine more expensive because more stringent pollution control measures may need to be taken to maintain existing water quality in Buehman Canyon Creek.

The economic issue at stake resulting from the designation of Buehman Canyon Creek as a unique water is not simply a matter of assessing the costs and benefts of mining on lands with known mineral (i.e., non-renewable) deposits. The economic viability of the proposed Korn Kob operations has not been established because the mine plan is not complete and considerable uncertainty exists not only as regards the technical feasibility of the project, but also as to its acceptability in the world's capital markets. More importantly, the economic issues revolve around making a determination of which competing land uses will bring more net benefits (both in dollar as well as non-quantifiable terms) to more of Arizona citizens as well as visitors from other states and elsewhere. At another level of analysis, it is important to focus on the probable net benefits that will accrue to Arizona citizens not only in the short-term, but in the long-term future. Environmental preservation carries significant potential for bringing nature-based, eco-tourism-related dollar benefits to Arizona communities. Buehman Canyon Creek is a renewable resource, provided state decision-makers make choices which preserve its outstanding natural resource values. Tourism in Arizona is a $9.7 billion industry today. The state has an opportunity in this rulemaking to take action to maintain and preserve 1 of Arizona's increasingly rare riparian areas. ADEQ urges the members of the Governor's Regulatory Review Council to place the public interest before special interest and to take a long term view of the Arizona's economic future by approving the nomination of Buehman Canyon Creek as a unique water.

Alternatives

ADEQ does not believe there are any less costly or less intrusive alternative methods of achieving the purpose of the adopted rules.

9. **A description of the changes between the proposed rules and final rules:**

All changes between the proposed rules and the adopted rules are indicated below. New language that was added to the proposed rules is underlined. Language that was deleted from the proposed rules is indicated by ~~strikethroughs~~. The captions of Sections of the proposed rules that were not changed are presented followed by the words *"No change"* in *italics*.

R18-11-101. Definitions

The terms of this Article ~~shall~~ have the following meanings:

1. "Acute toxicity" means toxicity involving a stimulus severe enough to rapidly induce a response. In aquatic toxicity tests, an effect observed in 96 hours or less is considered acute.
2. "AgI" means agricultural irrigation.
3. "AgL" means agricultural livestock watering.
4. "Agricultural irrigation" means the use of a surface water for the irrigation of crops.
5. "Agricultural livestock watering" means the use of a surface water as a supply of water for consumption by livestock.
6. "Annual mean" means the arithmetic mean of monthly values determined over a consecutive 12-month period, provided that monthly values are determined for at least 3 months. The monthly value ~~shall be~~ is the arithmetic mean of all values determined in a calendar month.
7. "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.
8. "Aquatic and wildlife (effluent dependent water)" means the use of an effluent dependent water by animals, plants, or other organisms for habitation, growth, or propagation.
9. "Aquatic and wildlife (ephemeral)" means the use of an ephemeral water by animals, plants, or other organisms, exclud-

ing fish, for habitation, growth, or propagation.

10 "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.

11. "A&Wc" means aquatic and wildlife (cold water fishery).

12. "A&We" means aquatic and wildlife (ephemeral).

13. "A&Wedw" means aquatic and wildlife (effluent dependent water).

14. "A&Ww" means aquatic and wildlife (warm water fishery).

15. "Clean Water Act" means the Federal Water Pollution Control Act, as amended by the Water Quality Act of 1987.

16. "Criteria" means elements of water quality standards that are expressed as pollutant concentrations, levels, or narrative statements representing a water quality that supports a designated use.

17. "Designated use" means a use specified in Appendix B of this Article for a surface water.

18 "Domestic water source" means the use of a surface water as a potable water supply. Coagulation, sedimentation, filtration, disinfection, or other treatments may be necessary to yield a finished water suitable for human consumption.

19. "DWS" means domestic water source.

20. "EDW" means effluent dependent water.

21. "Effluent dependent water" means a surface water that consists primarily of discharges of treated wastewater ~~and that~~ which has been classified as an effluent dependent water by the Director ~~pursuant to A.A.C.~~ under R18-11-113.

22. "Ephemeral water" means 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.

23. "Existing use" means a use that ~~is actually attained~~ has actually occurred in a surface water on or after November 28, 1975, or a use that the existing water quality of a surface water will allow.

24. "Fast land" means land that was once a surface water but no longer remains a surface water because it has been and remains legally converted to land by the discharge of dredged or fill material that: 1) was authorized by a §404 permit; 2) exempt from §404 permit requirements; or 3) occurred before there was a §404 permit requirement for the discharge of the dredged or fill material.

~~25.~~ 24. "FBC" means full body contact.

~~26.~~ 25. "FC" means fish consumption.

~~27.~~ 26. "Fish consumption" means the use of a surface water by humans for harvesting aquatic organisms for consumption. Harvestable aquatic organisms include, but are not limited to fish, clams, turtles, crayfish, and frogs.

~~28.~~ 27. "Full body contact" means the use of a surface water which causes the human body to come into direct contact with the water to the point of complete submergence. The use is such that ingestion of the water is likely to occur and certain sensitive body organs, such as the eyes, ears, or nose may be exposed to direct contact with the water.

~~29.~~ 28. "Geometric mean" means the nth root of the product of n items or values. The geometric mean is calculated using the following formula:

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

~~30.~~ 29. "Hardness" means the sum of the calcium and magnesium concentrations, expressed as calcium carbonate ($CaCO_3$), in milligrams per liter.

~~31.~~ 30. "Mixing zone" means a prescribed area or volume of a surface water that is contiguous to a point source discharge where initial dilution of the discharge takes place.

~~32.~~ 31. "National Pollutant Discharge Elimination System" means the point source discharge permit program established by §402 of the Clean Water Act.

~~32. "Navigable waters" means the waters of the United States.~~

~~33.~~ 32. "Ninetieth percentile" means the value which may not be exceeded by more than 10% of the observations in a consecutive 12-month period. A minimum of 10 samples, each taken at least 10 days apart, are required to determine a ninetieth percentile.

~~34.~~ 33. "NNS" means no numeric standard.

~~35.~~ 34. "Oil" means petroleum in any form, including but not limited to crude oil, gasoline, fuel oil, diesel oil, lubricating oil, or sludge.

~~36.~~ 35. "Partial-body contact" means the use of a surface water which may cause the human body to come into direct contact with the water, but normally not to the point of complete submergence. The use is such that ingestion of the water is not likely to occur, nor will sensitive body organs such as the eyes, ears, or nose normally be exposed to direct contact with the water.

~~37.~~ 36. "PBC" means partial body contact.

~~38.~~ 37. "Practical quantitation limit" means the lowest level of quantitative measurement that can be reliably achieved during routine laboratory operations.

~~39.~~ 38. "Recreational uses" means the full-body contact and partial-body contact designated uses.

~~40.~~ 39. "Regional Administrator" means the ~~regional~~ Regional Administrator of Region 9 of the Environmental Protection Agency.

~~41.~~ 40. "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:

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 or foreign commerce;

D. All impoundments of ~~surface waters~~ waters otherwise defined as surface waters under this definition;

E. Tributaries of surface waters identified in subsections (A) through (D) of this definition; and

F. Wetlands adjacent to surface waters identified in subsections (A) through (E) of this definition.

~~42.~~ 41. "Total nitrogen" means the sum of the concentrations of ammonia (NH_3), ammonium ion (NH_4+), nitrite (NO_2-), nitrate (NO_3-), and dissolved and particulate organic nitrogen expressed as elemental nitrogen.

~~43.~~ 42. "Total phosphorus" means all the phosphorus present in the sample, regardless of form, as measured by a persulfate digestion procedure.

~~44.~~ 43. "Toxic" means those pollutants, or combination of pollutants, which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations in such organisms or their offspring.

~~45.~~ 44. "Unique water" means a surface water which has been classified as an outstanding state resource water by the Director ~~pursuant to A.A.C.~~ under R18-11-112.

~~46.~~ 45. "Use attainability analysis" means a structured scientific assessment of the factors affecting theattainment of a designated use which may include physical, chemical, biological, and economic factors.

~~47.~~ 46. "Wetlands" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, cienegas, tinajas, and similar areas.

~~48.~~ 47. "Zone of passage" means a continuous water route of volume, cross-sectional area and quality necessary to allow passage of free-swimming or drifting organisms with no toxic effect produced on the organisms.

R18-11-102. Applicability

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

B. The water quality standards prescribed in this Article do not apply to the following:

1. Waste treatment systems, including impoundments, ponds, lagoons, and constructed wetlands that are a part of such waste treatment systems.

2. Man-made surface impoundments and associated ditches and conveyances used in the extraction, beneficiation and processing of metallic ores, including pits, pregnant leach solution ponds, raffinate ponds, tailing impoundments,

decant ponds, concentrate or tailing thickeners, blowdown water ponds, ponds and sumps in mine pits associated with dewatering activity, ponds holding water that has come in contact with process or product and that is being held for recycling, spill or upset catchment ponds, or ponds used for on-site remediation that are not ~~a~~ surface ~~water~~ waters or are located in ~~an area~~ areas that once ~~was~~ were surface ~~water~~ waters but no longer ~~remains~~ remain ~~a~~ surface ~~water~~ waters because ~~it has~~ they have been and ~~remains~~ remain legally converted.

R18-11-103. Reserved

No change.

R18-11-104. Designated Uses

A. The Director shall adopt or remove designated uses and subcategories of designated uses by rule.

B. Designated uses of a surface water may include full body contact, partial body contact, domestic water source, fish consumption, aquatic and wildlife (cold water fishery), aquatic and wildlife (warm water fishery), aquatic and wildlife (ephemeral), aquatic and wildlife (effluent dependent water), agricultural irrigation and agricultural livestock watering. The designated uses for specific surface waters are listed in Appendix B of this Article.

C. Numeric water quality criteria to protect the designated uses are prescribed in Appendix A, R18-11-109, R18-11-110, and R18-11-112. Narrative standards to protect all surface waters are prescribed in

R18-11-108. Narrative Water Quality Standards

D. If a surface water has more than ~~1~~ 1 designated use listed in Appendix B, then the most stringent water quality criterion applies.

E. The Director shall revise the designated uses of a navigable surface water if water quality improvements result in a level of water quality which permits a use that is not currently listed as a designated use in Appendix B.

F. In designating uses of a surface water and in establishing water quality criteria to protect those designated uses, the Director shall take into consideration the applicable water quality standards for downstream surface waters and shall ensure that the water quality standards that are established for an upstream surface water also provide for the attainment and maintenance of the water quality standards of downstream surface waters.

G. A use attainability analysis shall be conducted prior to removal of a designated use or adoption of a subcategory of a designated use that requires less stringent water quality criteria.

H. The Director may remove a designated use or adopt a subcategory of a designated use that requires less stringent water quality criteria, provided the designated use is not an existing use and it is demonstrated through a use attainability analysis that attaining the designated use is not feasible for any of the following reasons:

1. Naturally occurring pollutant concentrations prevent the attainment of the use;
2. Natural, ephemeral, intermittent, or low-flow conditions or water levels 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 surface water to its original condition or to operate such modification in a way that would result in attainment of the use;
5. Physical conditions related to the natural features of the surface water, 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.

R18-11-105. Tributary

The following water quality standards apply to a surface water that is not listed in Appendix B but that is a tributary to a listed surface water:

1. For an unlisted tributary that is an ephemeral water, the aquatic and wildlife [ephemeral] and partial body contact standards ~~shall~~ apply.
2. For an unlisted tributary that is an effluent dependent water, the aquatic and wildlife [effluent dependent water] standards and partial body contact standards ~~shall~~ apply.
3. For an unlisted tributary that is not an ephemeral water or an effluent dependent water and which has salmonids present, the aquatic and wildlife [cold water fishery] and fish consumption standards ~~shall~~ apply as well as the water quality standards that have been established for the nearest downstream surface water listed in Appendix B that is not an ephemeral water or an effluent dependent water.

4. For an unlisted tributary that is not an ephemeral water or an effluent dependent water and which does not have salmonids present, the aquatic and wildlife [warm water fishery] and fish consumption standards ~~shall~~ apply as well as the water quality standards which have been established for the nearest downstream surface water listed in Appendix B that is not an ephemeral water or effluent dependent water.

R18-11-106. Net Ecological Benefit

A. The Director may, by rule, modify a water quality standard on the ~~grounds~~ ground that there is a net ecological benefit associated with the discharge of effluent to support or create a riparian and aquatic habitat in an area where such water resources are limited. The Director may modify a water quality criterion for a pollutant if it is demonstrated that:

1. The discharge of effluent creates or supports an ecologically valuable aquatic, wetland, or riparian ecosystem in an area where such resources are limited.

2. The ecological benefits associated with the discharge of effluent under a modified water quality standard ~~exceeds~~ exceed the environmental costs associated with the elimination of the discharge of effluent.

3. The cost of treatment to achieve compliance with a water quality standard is so high that it is more cost effective to eliminate ~~completely~~ the discharge of effluent to the surface water. The discharger shall demonstrate that it is feasible to eliminate ~~completely~~ the discharge of effluent which creates or supports the ecologically valuable aquatic, wetland or riparian ecosystem and that a plan to eliminate the discharge is under active consideration.

4. The discharge of effluent to the surface water will not cause or contribute to a violation of a water quality standard that has been established for a downstream surface water.

5. All practicable point source discharge control programs, including local pretreatment, waste minimization, and source reduction programs, are implemented; and

6. The discharge of effluent does not produce or contribute to the concentration of a pollutant in the tissues of aquatic organisms or wildlife that is likely to be harmful to humans or wildlife through food chain concentration.

B. The Director shall not modify a water quality criterion for a pollutant to be less stringent than a technology-based effluent limitation which applies to the discharge of that effluent. The discharge of effluent which creates or supports and ecologically valuable aquatic, riparian or wetland ecosystem shall, at a minimum, comply with applicable technology-based effluent limitations.

R18-11-107. Antidegradation

A. The Department shall determine whether there is any degradation of water quality in a surface water on a pollutant-by-pollutant basis.

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

~~B.~~ C. Tier 2: Where existing water quality in a surface water is better than the applicable water quality ~~standards~~ standard, the existing water quality shall be maintained and protected. The Director may allow limited degradation of existing water quality in ~~a Tier 2~~ the surface water, provided that the Department has held a public hearing on whether degradation should be allowed pursuant to the general public hearing procedures prescribed at A.A.C. R18-1-401 and R18-1-402 and the Director makes all of the following findings:

1. The level of water quality necessary to protect existing uses is fully protected.

2. The highest statutory and regulatory requirements for all new and existing point sources as set forth in the Clean Water Act are achieved.

3. All cost-effective and reasonable best management practices for nonpoint source control are implemented.

4. Allowing lower water quality is necessary to accommodate important economic or social development in the area in which the surface water is located.

~~C.~~ 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 ~~A.A.C.~~ R18-11-112. The Director shall not allow limited degradation of a unique water pursuant to subsection (B) of this Section.

~~D.~~ E. ~~Nothing in this Section or in the implementation of this Section shall be inconsistent~~ The Department shall implement this Section in a manner that is consistent with §316 of the Clean Water Act where a potential water quality impairment associated with a thermal discharge is involved.

R18-11-108. Narrative Water Quality Standards

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

1. Settle to form bottom deposits that inhibit or prohibit the habitation, growth or propagation of aquatic life or that impair recreational uses;

2. Cause objectionable odor in the area in which the surface water is located;
3. Cause off-taste or odor in drinking water;
4. Cause off-flavor in aquatic organisms or waterfowl;
5. Are toxic to humans, animals, plants, or other organisms;
6. Cause the growth of algae or aquatic plants that inhibit or prohibit the habitation, growth or propagation of other aquatic life or that impair recreational uses;
7. Cause or contribute to a violation of an aquifer water quality standard prescribed in ~~A.A.C.~~ R18-11-405 or A.A.C. R18-11-406; or
8. Change the color of the surface water from natural background levels of color.

B. A surface water shall be free from oil, grease and other pollutants that 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 watercraft shall not be considered a violation of this narrative standard.

R18-11-109. Numeric Water Quality Standards

A. The water quality standards prescribed in this Section and in Appendix A apply to surface waters listed in Appendix B and their tributaries. Additional numeric water quality standards for unique waters are prescribed in R18-11-112.

B. The following water quality standards for fecal coliform, expressed in colony forming units per 100 milliliters of water (cfu/100 ml), shall not be exceeded:

1. Fecal Coliform	DWS,PBC,A&W[1],AgI,AgL
30-day geometric mean (5 sample minimum)	1000
10% of samples for a 30-day period	2000
Single sample maximum	4000

2. Fecal coliform in effluent dependent waters	All designated uses
30-day geometric mean (5 sample minimum)	200
10% of samples for a 30-day period	400
Single sample maximum	800

C. 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
30-day geometric mean (5 sample minimum)		130
~~10% of samples for a 30-day period~~	~~240~~	
~~Single sample maximum~~	~~580~~	

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

pH	DWS	FBC,PBC,A&W[2]	AgI	AgL
Maximum	9.0	9.0	9.0	9.0
Minimum	5.0	6.5	4.5	6.5
Maximum change due to discharge	NNS	0.5	NNS	NNS

E. The following maximum allowable increase in ambient water temperature, expressed in degrees Celsius, shall not be exceeded:

Temperature[3]	A&Ww,A&Wedw	A&Wc

Maximum increase due to a discharge[4,5 3,4]	3.0	1.0

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

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

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

1. Dissolved oxygen[6]

	A&Ww	A&Wc
Single sample minimum[7,8 5]	6.0	7.0

2. Dissolved oxygen in effluent dependent waters [single sample minimum]:

	A&Wedw
3 hours after sunrise to sunset	3.0
Sunset to 3 hours after sunrise	1.0

3. If the dissolved oxygen (mg/L) of a surface water is less than the water quality standard for dissolved oxygen, but the percent saturation of oxygen is equal to or greater than 90%, then the surface water shall be deemed to be in compliance with the water quality standard for dissolved oxygen.

H. The following water quality standards for total phosphorus and total nitrogen, expressed in milligrams per liter (mg/L), shall not be exceeded:

	Annual mean	90th percentile	Single Sample Maximum
1. Verde River and its tributaries from headwaters to Bartlett Lake:			
Total phosphorus	0.10	0.30	1.00
Total nitrogen	1.00	1.50	3.00
2. Black River, Tonto Creek and their tributaries that are not located on tribal lands:			
Total phosphorus	0.10	0.20	0.80
Total nitrogen	0.50	1.00	2.00
3. Salt River and its tributaries, except Pinal Creek, above Theodore Roosevelt Lake, that are not located on tribal lands:			
Total phosphorus	0.12	0.30	1.00
Total nitrogen	0.60	1.20	2.00
4. Theodore Roosevelt, Apache, Canyon, and Saguaro Lakes:			
Total phosphorus	0.03[a]	NNS	0.60[b]
Total nitrogen	0.30[a]	NNS	1.00[b]
5. Salt River below Stewart Mountain Dam to confluence with the Verde River:			
Total phosphorus	0.05	NNS	0.20
Total nitrogen	0.60	NNS	3.00
6. Little Colorado River and its tributaries above River Reservoir in Greer; South Fork of Little Colorado River above South Fork Campground; Water Canyon Creek above Apache-Sitgreaves National Forest boundary:			
Total phosphorus	0.08	0.10	0.75
Total nitrogen	0.60	0.75	1.10

7. Little Colorado River at crossing of Apache County Road No. 124:

Total phosphorus	NNS	NNS	0.75
Total nitrogen	NNS	NNS	1.80

8. Little Colorado River above Lyman Lake to above Amity Ditch diversion near crossing of Arizona Highway 273 (applies only when in-stream turbidity is less than 50 NTU):

Total phosphorus	0.20	0.30	0.75
Total nitrogen	0.70	1.20	1.50

9. Colorado River, at Northern International Boundary near Morelos Dam:

Total phosphorus	NNS	0.33	NNS
Total nitrogen	NNS	2.50	NNS

10. San Pedro River, from Curtiss to Benson:

Total phosphorus	NNS	NNS	NNS
Total nitrate as N	NNS	NNS	10.00

11. The discharge of wastewater to Show Low Creek and tributaries upstream of and including Fools Hollow Lake shall not exceed 0.16 mg/l total phosphates as P.

12. The discharge of wastewater to the San Francisco River and tributaries upstream of Luna Lake Dam shall not exceed 1.0 mg/l total phosphates as P.

I. The following water quality standards for radiochemicals shall not be exceeded:

1. In all surface waters, the concentration of radiochemicals shall not exceed the limits established by the Arizona Radiation Regulatory Agency in 12 A.A.C. 1, Article 4, Appendix A, Table II, Column 2 (effective June 30, 1977, and no future amendments), which is incorporated by reference and on file with the Office of the Secretary of State and with the Department.

2. In surface waters that are designated as domestic water sources, the following water quality standards for radiochemicals shall not be exceeded:

a. The concentration of gross alpha particle activity, including radium-226 but excluding radon and uranium, shall not exceed 15 picocuries per liter of water.

b. The concentration of combined radium-226 and radium-228 shall not exceed 5 picocuries per liter of water.

c. The concentration of strontium-90 shall not exceed 8 picocuries per liter of water.

d. The concentration of tritium shall not exceed 20,000 picocuries per liter of water.

e. The average annual concentration of beta particle activity and photon emitters from man-made radionuclides shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirems per year.

Footnotes:

[1]Includes A&Wc, A&Ww and A&We.

[2]Includes A&Wc, A&Ww, A&Wedw and A&We.

[3]There is no water quality standard for temperature for the A&We designated use.

[43]Does not apply to Cholla Lake.

[5 4]Does not apply to a wastewater treatment plant discharge to a dry watercourse that creates an effluent dependent water.

[6]There is no dissolved oxygen standard for the A&We designated use.

[7 5]The dissolved oxygen water quality standard for a lake shall apply below the surface but not at a depth greater than 1 meter.

[a]means annual mean of representative composite samples taken from the surface and at 2 and 5 meter depths.

[b]means maximum for any set of representative composite samples taken from the surface and at 2 and 5 meter depths.

R18-11-111. Analytical Methods

A. ~~Analysis~~ A person conducting an analysis of a sample taken to determine compliance with a water quality standard shall ~~be in accordance with~~ use an approved analytical method prescribed in ~~Title 9, Chapter 14, Article 6 of the Arizona Administrative Code~~ 9 A.A.C. 14, Article 6 or an alternative analytical method that is approved by the Director of the Department of Health Services ~~pursuant to~~ under ~~A.A.C.~~ R9-14-607(B).

B. A test result from a sample taken to determine compliance with a water quality standard ~~shall be~~ is valid only if the sample has been analyzed by a laboratory that is licensed by the Arizona Department of Health Services for the analysis performed.

R18-11-112. Unique Waters

A. ~~The classification of~~ The Director shall use rulemaking to classify a surface water as a unique water ~~shall be by rule~~.

B. The Director may adopt, by rule, site-specific water quality standards to maintain and protect existing water quality in a unique water.

C. Any person may nominate a surface water for classification as a unique water by filing a petition for rule adoption with the Department. A petition for rule adoption to classify a surface water as a unique water shall include:

1. A map and a description of the surface water;
2. A written statement in support of the nomination, including specific reference to the applicable criteria for unique waters classification as prescribed in subsection (D) of this Section;
3. Supporting evidence demonstrating that 1 or more of the applicable unique waters criteria prescribed in subsection (D) of this Section has been met; and
4. Available water quality data relevant to establishing baseline water quality of the proposed unique water.

D. ~~A surface water may be classified~~ The Director may classify a surface water as a unique water ~~by the Director~~ upon ~~a~~ finding that the surface water is an outstanding state resource water based upon ~~1~~ 1 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 the wilderness characteristics of the surface water.
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. Endangered or threatened species are identified on the following lists which are hereby incorporated by reference and on file with the Office of the Secretary of State and with the Department:
   a. Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12 (revised as of ~~July 12, 1995~~ October 1, 1994);
   b. "Threatened Native Wildlife of Arizona," Game and Fish Department (July 21, 1988);
   c. List of highly safeguarded protected native plants in ~~Arizona Administrative Code, Title 3, Chapter 6, Article 6, Appendix A, subsection (A)~~ 3 A.A.C. 4, Article 6, Appendix A(A) (December 20, 1994);
   d. Federally Listed Threatened and Endangered Species of Arizona," U.S. Fish & Wildlife Service (June 6, 1995).

E. The following surface waters are classified as unique waters:

1. The West Fork of the Little Colorado River, above Government Springs;
2. Oak Creek, including the West Fork of Oak Creek;
3. Peeples Canyon Creek, tributary to Santa Maria River;
4. Burro Creek, above its confluence with Boulder Creek;
5. Francis Creek, Mohave and Yavapai counties;
6. Bonita Creek, tributary to the upper Gila River;
7. Cienega Creek, from I-10 bridge to Del Lago Dam, Pima County;
8. Aravaipa Creek, from confluence of Stowe Gulch to the downstream boundary of the Aravaipa Canyon Wilderness Area;
9. Cave Creek and South Fork of Cave Creek [Chiricahua Mountains], from headwaters to the Coronado National Forest boundary; and
10. Buehman Canyon Creek, from headwaters [Lat. 32°24'55.5"N, Long. 110°39'43.5" W] to approximately 9.8 miles downstream [Lat. 32°24'31.5" N, ~~Longitude~~ Long. 110°32'08" W].

F. The following water quality standards are established ~~to maintain and protect existing water quality in~~ for the listed unique waters. Water quality standards prescribed in this subsection supplement the water quality standards prescribed pursuant to R18-11-109.

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

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

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

Parameter	Standard
pH (standard units)	no change due to discharge
Nitrogen (T)	1.00 mg/L (annual mean)
	1.50 mg/L (90th percentile)
	2.50 mg/L (single sample max.)
Phosphorus (T)	0.10 mg/L (annual mean)
	0.25 mg/L (90th percentile)
	0.30 mg/L (single sample max.)
Chromium (as Cr)(D)	5 µg/L
~~Zinc (D)~~	~~50 µg/L~~
Turbidity change due to discharge	3 NTU

3. Peeples Canyon Creek, tributary to Santa Maria River:

Parameter	Standard
Temperature	no increase due to discharge
Dissolved oxygen	no decrease due to discharge
Turbidity change due to discharge	5 NTU
Arsenic (T)	20 µg/L
Manganese (T)	500 µg/L

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

Parameter	Standard
Manganese (T)	500 µg/L

5. Francis Creek, Mohave and Yavapai Counties:

Parameter	Standard
Manganese (T)	500 µg/L

6. Cienega Creek, from I-10 bridge to Del Lago Dam, Pima County:

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

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

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

Abbreviations:
(D) means dissolved fraction
(T) means total recoverable
NTU means nephelometric turbidity unit
mg/L means milligrams per liter
µg/L means micrograms per liter

R18-11-113. Effluent Dependent Waters

A. The ~~classification of~~ Director shall use rulemaking to classify a surface water as an effluent dependent water ~~shall be by rule~~.

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

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

1. A map and a description of the surface water.
2. Information that demonstrates that the surface water consists primarily of discharges of treated wastewater.

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

1. **In the Colorado River Main Stem Basin:**
   a. Bright Angel Wash from South Rim Grand Canyon WWTP outfall to confluence with Coconino Wash.
   b. Cataract Creek from Williams WWTP outfall to 1 kilometer downstream from the outfall.
   c. Holy Moses Wash from Kingman WWTP outfall to 3 kilometers downstream from the outfall.
   d. Transept Canyon from North Rim Grand Canyon WWTP outfall to 1 kilometer downstream.
2. **In the Little Colorado River Basin:**
   a. Dry Lake.
   b. Lake Humphreys.
   c. Lower Walnut Canyon Lake.
   d. Ned Lake.
   e. Pintail Lake.
   f. Telephone Lake
   g. Rio de Flag from City of Flagstaff WWTP outfall to confluence with San Francisco Wash.
   h. Whale Lake
3. **In the Middle Gila River Basin:**
   a. Unnamed wash from the Town of Prescott Valley WWTP outfall to the confluence with the Agua Fria River, and the Agua Fria River below the confluence with the unnamed wash receiving treated wastewater from the Prescott Valley WWTP to State Route 169.
   b. Agua Fria River from El Mirage WWTP outfall to 2 kilometers downstream from the outfall.
   c. Gila River from Florence WWTP outfall to Felix Road.
   d. Gila River from confluence with the Salt River to Gillespie Dam.
   e. Queen Creek from Superior Mining Division discharge outfall to confluence with Potts Canyon.
   f. Unnamed wash from Gila Bend WWTP outfall to confluence with Gila River.

g. Unnamed wash from Luke AFB WWTP outfall to the confluence with Agua Fria River.

h. Unnamed wash from Queen Valley WWTP outfall to confluence with Queen Creek.

4. **In the Rios de Mexico Basin:**

a. Mule Gulch, from Bisbee WWTP outfall to confluence with Whitewater Draw.

b. Unnamed wash from Bisbee-Douglas International Airport WWTP outfall to Whitewater Draw.

5. **In the Salt River Basin:**

a. Unnamed wash from Globe WWTP outfall to confluence with Pinal Creek and from confluence of unnamed wash and Pinal Creek to Radium.

b. Salt River from 23rd Avenue WWTP outfall to confluence with the Gila River.

6. **In the San Pedro River Basin:**

a. Unnamed wash from Mt. Lemmon WWTP outfall to 0.25 kilometers downstream.

b. Walnut Gulch from Tombstone WWTP outfall to confluence with Tombstone Gulch.

7. **In the Santa Cruz River Basin:**

a. Santa Cruz River from Nogales International WWTP outfall to Tubac Bridge.

b. Santa Cruz River from Roger Road WWTP outfall to Baumgartner Road crossing.

c. Unnamed wash from Oracle WWTP outfall to 5 kilometers downstream.

d. Sonoita Creek from Town of Patagonia WWTP outfall to 750 feet downstream.

8. **In the Upper Gila River Basin:**

a. Bennett Wash from Arizona Department of Corrections-Safford WWTP outfall to Gila River.

b. Unnamed wash from Arizona Department of Corrections-Globe WWTP outfall to the boundary of the San Carlos Indian Reservation.

9. **In the Verde River Basin:**

a. American Gulch from Northern Gila County Sanitary District WWTP outfall to the East Verde River.

b. Bitter Creek from Jerome WWTP outfall to 2.5 kilometers downstream from the outfall.

c. Jacks Canyon Wash from Big Park WWTP outfall to confluence with Dry Beaver Creek.

E. The NPDES permit issuing authority shall use the water quality standards that apply to an effluent dependent water ~~shall be used~~ to derive discharge limitations for a point source discharge from a wastewater treatment plant to an ephemeral water which changes that ephemeral water into an effluent dependent water.

R18-11-114. Mixing Zones

A. The Director may, by order, establish a mixing zone in a surface water. Mixing zones are prohibited in ephemeral waters or where there is no water for dilution.

B. The owner or operator of a point source seeking the establishment of a mixing zone shall submit a mixing zone application to the Department on a standard form that is available from the Department. The application shall include:

1. Identification of the pollutant for which the mixing zone is requested;

2. A proposed outfall design;

3. A definition of the boundary of the proposed mixing zone. For purposes of this subsection, the boundary of a mixing zone means the location where the concentration of treated wastewater across a transect of the surface water differs by less than 5%.

4. A complete and detailed description of the existing physical, biological, and chemical conditions of the receiving water and of the predicted impact on such conditions from the proposed mixing zone.

5. Information which demonstrates that there will be no acute toxicity in the proposed mixing zone.

C. The Department shall review the application for a mixing zone to determine whether the application is complete. If the application is incomplete, the Department shall identify in writing the additional information that must be submitted to the Department before the Department can take administrative action on the application for a mixing zone.

D. When the application for a mixing zone is complete, the Department shall make a preliminary determination of whether to establish the mixing zone. The Department shall give public notice and ~~conduct~~ provide an opportunity for a public

hearing on whether to establish a mixing zone pursuant to the administrative procedures prescribed in ~~A.A.C.~~ R18-1-401 and R18-1-402.

E. In making the determination of whether to grant or deny the request for the establishment of a mixing zone, the Director shall consider the following factors: sediment deposition, bioaccumulation, bioconcentration, predicted exposure of biota and the likelihood that resident biota will be adversely affected, whether there will be acute toxicity in the mixing zone, the known or predicted safe exposure levels for the pollutant of concern, the likelihood of adverse human health effects, the size of the mixing zone, location of the mixing zone relative to biologically sensitive areas in the surface water, concentration gradient within the mixing zone, the physical habitat, the potential for attraction of aquatic life to the mixing zone, and the cumulative impacts of other mixing zones and other discharges to the surface water.

F. The Director shall deny the request to establish a mixing zone if water quality standards outside the boundaries of the proposed mixing zone will be violated or if concentrations of pollutants within the proposed mixing zone will cause acute toxicity to aquatic life. Denials of applications for a mixing zone shall be in writing and shall state the reasons for the denial. If the Director determines that a mixing zone should be established, he shall issue an order to establish the mixing zone. The Director may include conditions in the order that the Director deems ~~are~~ necessary to protect human health and the designated uses of the surface water. A copy of the Director's decision and order shall be sent by certified mail to the applicant.

G. Any person who is adversely affected by an order of the Director pertaining to a mixing zone may appeal the Director's decision to an administrative law judge pursuant to A.R.S. § 49-321.

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

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

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

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

R18-11-115. Nutrient Waivers

A. The Department may waive the water quality standards for total phosphorus and total nitrogen ~~may be waived~~ on a discharger-specific basis for a discharge to an ephemeral water which is tributary to a surface water for which water quality standards for total nitrogen or total phosphorus are prescribed in ~~A.A.C.~~ R18-11-109(H).

B. A discharger who seeks a nutrient waiver shall submit an application to the Department on a standard form that is available from the Department. The application shall include:

1. Identification of the applicant.
2. Information on the discharging facility, including:
   a. Date the facility was placed in service;
   b. Location of the facility;
   c. Location of the discharge point;
   d. Wastewater treatment method; and
   e. Discharge flow.
3. Information on the receiving surface water, including:
   a. Name of the receiving water;
   b. Distance in river miles to the nearest downstream surface water ~~with perennial flow~~; and
   c. Distance from the point of discharge to the point where the flow goes subsurface during an average dry season.
4. Information which demonstrates that the nearest downstream surface water ~~with perennial flow~~ is free from pollutants in amounts or combinations which 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.
5. Water quality data, including:
   a. Monthly average, 90th percentile and single sample maximum concentrations of total phosphorus and total nitrogen as measured at the point of discharge;
   b. Monthly average, 90th percentile and single sample maximum concentrations of total phosphorus and total nitrogen as measured at a downstream control point established by the Department; and

c. Discharge flow at the time of sampling.

C. The Department shall review the application for completeness and shall notify the applicant in writing whether the application is complete or whether additional information needs to be submitted to the Department.

D. Once an application for a nutrient waiver is complete, the Department shall make a preliminary determination of whether to grant or deny the nutrient waiver. The Department shall issue public notice and ~~conduct~~ provide an opportunity for a public hearing on whether the request for a nutrient waiver should be granted pursuant to procedures prescribed in A.A.C. R18-1-401 and ~~A.A.C.~~ R18-1-402.

E. The Director may, by order, grant a nutrient waiver provided the discharge will not cause a violation of a water quality standard for total phosphorus or total nitrogen in any downstream ~~perennial~~ surface water or cause a violation of narrative standards prescribed in R18-11-108. A copy of the Director's decision and order shall be sent by certified mail to the applicant.

F. Any person who is adversely affected by an order granting or denying a nutrient waiver may appeal the decision to an administrative law judge pursuant to A.R.S. § 49-321.

G. A nutrient waiver ~~shall be for~~ expires after a fixed term not to exceed 5 years. ~~A nutrient waiver shall be reevaluated~~ The Department shall reevaluate a nutrient waiver upon issuance, reissuance, or modification of the National Pollutant Discharge Elimination System permit for the point source.

R18-11-117. Canals and Municipal Park Lakes

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

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

R18-11-118. Dams and Flood Control Structures

A. Increases in turbidity that result from the routine physical or mechanical maintenance of dams and flood control structures ~~shall not be construed as~~ are not violations of this Article.

B. Nothing in this Article shall be construed to require a person who operates a dam or flood control structure to operate ~~such~~ the structure ~~so as~~ to cure or mitigate an exceedance of a water quality standard caused by another person.

C. Nothing in this Article shall be construed to require the releases of water from dams.

R18-11-120. Enforcement

A. Any person who causes a violation of a water quality standard or any provision of this Article is subject to the enforcement provisions prescribed in A.R.S. Title 49, Chapter 2, Article 4.

B. ~~A numeric water quality standard may be established~~ The Department may establish a numeric water quality standard at a concentration that is below the practical quantitation limit. In such cases, the water quality standard is enforceable at the practical quantitation limit.

C. ~~Compliance with acute aquatic and wildlife criteria shall be determined~~ The Department shall determine compliance with acute aquatic and wildlife criteria from the analytical test result of a grab sample. 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 1 grab sample per day.

D. A person is not subject to penalties for violation of a water quality standard provided that ~~such~~ the person is in compliance with the provisions of a compliance schedule issued pursuant to R18-11-121.

R18-11-121. Schedules of Compliance

A. A schedule to bring an existing point source into compliance with a new or revised water quality standard may be established in a National Pollutant Discharge Elimination System permit for the existing point source. A compliance schedule for an existing point source, other than a stormwater discharge, shall require compliance with a discharge limitation based upon a new or revised water quality standard no later than 3 years after the ~~date of issuance~~ effective date of the National Pollutant Discharge Elimination System permit. In order for a schedule of compliance to be granted, the owner or operator of the existing point source shall demonstrate that all requirements under §301(b) and §306 of the Clean Water Act have been achieved and that the point source cannot comply with a discharge limitation based upon the new or revised water quality standard through the application of existing water pollution control technology, operational changes or source reduction.

B. A schedule of compliance shall not be established in a National Pollutant Discharge Elimination System permit for a new point source. For purposes of this subsection, 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.

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

R18-11-122. Variances

A. The Director may grant a variance from a water quality standard for a point source discharge provided the discharger demonstrates that treatment more advanced than that required to comply with technology-based effluent limitations is necessary to achieve compliance with the water quality standard and ~~it is not technically or economically feasible to achieve compliance within the next 5 years~~:

1. It is not technically feasible to achieve compliance within the next 5 years; or
2. The cost of the treatment would result in substantial and widespread economic and social impact.

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

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

D. A variance ~~shall be~~ is for a fixed term not to exceed 5 years.

Upon expiration of a variance, a point source discharger shall either comply with the water quality standard or apply for renewal of the variance. In order for a variance to be renewed, the applicant shall demonstrate ~~that~~ reasonable progress towards ~~achieving~~ compliance with the water quality standard ~~has been made~~ during the term of the variance.

E. ~~A variance shall be reevaluated~~ The Department shall reevaluate a variance upon the issuance, reissuance, or modification of the National Pollutant Discharge Elimination System permit for the point source discharge.

F. A person who seeks a variance from a water quality standard shall submit a letter to the Department requesting a variance. A request for a variance shall include the following information:

1. Identification of the specific pollutant and water quality standard for which a variance is sought;
2. Identification of the receiving surface water;
3. For an existing point source discharge, a detailed description of the existing discharge control technologies that are used to achieve compliance with applicable water quality standards. For a new point source discharge, a detailed description of the proposed discharge control technologies that will be used to achieve compliance with applicable water quality standards;
4. Documentation that the existing or proposed discharge control technologies will comply with technology-based effluent limitations and that more advanced treatment technology is necessary to achieve compliance with the water quality standard for which a variance is sought;
5. A detailed discussion of the reasons why compliance with the water quality standard cannot be achieved;
6. A detailed discussion of the discharge control technologies that are available for achieving compliance with the water quality standard for which a variance is sought;
7. Documentation ~~that it is not technically or economically feasible to install and operate any of the available discharge control technologies to achieve compliance with the water quality standard for which a variance is sought;~~ of 1 or both of the following:
   a. That it is not technically feasible to install and operate any of the available discharge control technologies to achieve compliance with the water quality standard for which a variance is sought; or
   b. That installation and operation of each of the available discharge control technologies to achieve compliance with the water quality standard for which a variance is sought would result in substantial and widespread economic and social impact;

8. Documentation that the point source discharger has reduced, to the maximum extent practicable, the discharge of the pollutant for which a variance is sought through implementation of a local pretreatment, source reduction, or waste minimization program;

9. ~~A person who requests a variance shall propose~~ A detailed description of proposed interim discharge limitations which represent the highest level of treatment achievable by the point source discharge during the term of the variance. Interim discharge limitations shall not be less stringent than technology-based effluent limitations.

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

H. The Department shall issue public notice and shall provide an opportunity for a public hearing on whether the request for a variance should be granted or denied pursuant to procedures prescribed in A.A.C. R18-1-401 and ~~A.A.C~~ R18-1-402.

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

J. ~~Variances shall not be granted~~ The Department shall not grant a variance for a point source discharge to a unique water listed in R18-11-112.

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

R18-11-123. Prohibition Against Discharge; Sabino Creek

No change.

Changes from December 29, 1995 proposal to Appendix A Human Health Numeric Water Quality Criteria					
PARAMETER	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)
Chloromethane	74-87-3	NNS ~~5.7~~	NNS ~~1800~~	NNS ~~230~~	NNS ~~2800~~
1,1,1-Trichloroethane	71-55-6	200	NNS ~~160000~~	NNS ~~12600~~	NNS ~~12600~~
Trichloroethylene	79-01-6	5	NNS ~~78~~	NNS ~~110~~	NNS

The changes to the above 3 parameters were made because of the withdrawal of reference doses or cancer potency slopes in the Integrated Risk

Information system database that were used to derive the water quality criteria. The withdrawal of these data required the repeal of the water qualitcriteria for the 3 pollutants.

Changes to Appendix B: Designated Uses of Arizona Water Bodies

BASIN	SEGMENT	LOCATION	A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
CM	Sawmill ~~Canyon~~ Wash	Below abandoned gaging station			A&We			PBC				AgL
MG	Alvord Park Lake	Municipal Park Lake; 35th Avenue & Baseline Road, Phoenix		A&Ww				PBC		FC		
MG	Bonsall Park Lake	Municipal Park Lake; 59th Avenue & Bethany Home Road, Phoenix		A&Ww				PBC		FC		
MG	Canal Park Lake	Municipal Park Lake; College Avenue & Curry Road, Tempe		A&Ww				PBC		FC		
MG	Chaparral Park Lake	Municipal Park Lake; Hayden Road & Chaparral Road, Scottsdale		A&Ww				PBC		FC	AgI	
MG	Cortez Park Lake	Municipal Park Lake; 35th Avenue & Dunlap Road, Glendale		A&Ww				PBC		FC	AgI	
MG	Desert Breeze Lake	Municipal Park Lake; Galaxy Drive, West Chandler		A&Ww				PBC		FC		
MG	Dobson Lake	Municipal Park Lake; Dobson Road & Los Lagos Vista Avenue, Mesa		A&Ww				PBC		FC		
MG	Eldorado Park Lake	Municipal Park Lake; Miller Road & Oak Street, Tempe		A&Ww				PBC		FC		
MG	Encanto Park Lake	Municipal Park Lake; 15th Avenue & Encanto Blvd., Phoenix		A&Ww				PBC		FC	AgI	
MG	Granada Park Lake	Municipal Park Lake; 6505 North 20th Street; Phoenix		A&Ww				PBC		FC		
MG	Indian Bend Wash Lakes	Municipal Park Lakes; Scottsdale		A&Ww				PBC		FC		
MG	Indian School Park Lake	Municipal Park Lake; Indian School Road & Hayden Road, Scottsdale		A&Ww				PBC		FC		
MG	Kiwanis Park Lake	Municipal Park Lake; 6000 South Mill Avenue, Tempe		A&Ww				PBC		FC	AgI	

Changes to Appendix B: Designated Uses of Arizona Water Bodies

BASIN	SEGMENT	LOCATION	A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	McKellips Park Lake	Municipal Park Lake; Miller Road and McKellips Road, Scottsdale		A&Ww				PBC		FC	AgI	
MG	Papago Park Ponds	Municipal Park Lake; Galvin Parkway, Phoenix		A&Ww				PBC		FC		
MG	Riverview Park Lake	Municipal Park Lake; Dobson Road & 8th Street, Mesa		A&Ww				PBC		FC		
MG	Roadrunner Park Lake	Municipal Park Lake; 36th Street & Cactus Road, Phoenix		A&Ww				PBC		FC		
MG	Vista Del Camino Park North	Municipal Park Lake; 7700 East Roosevelt Street, Scottsdale		A&Ww				PBC		FC		
MG	Vista Del Camino Park South	Municipal Park Lake; 7700 East Roosevelt Street, Scottsdale		A&Ww				PBC		FC		
SC	Agua Caliente Lake	Municipal Park Lake; 12325 East Roger Road, Tucson		A&Ww				PBC		FC		
~~SC~~	~~Agua Caliente Wash~~	~~Tributary to Tanque Verde Creek~~		~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
SC	Agua Caliente Wash	Headwaters to the Coronado National Forest boundary		A&Ww			FBC			FC		AgL
SC	Agua Caliente Wash	Below the Coronado National Forest boundary			A&We			PBC				AgL
~~SC~~	~~Fort Lowell Lake~~	~~Urban Lake; Tucson~~		~~A&Ww~~				~~PBC~~		~~FC~~		
~~SC~~	~~Harshaw Wash~~	~~Headwaters to Corral Canyon confluence~~		~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
~~SC~~	~~Harshaw Wash~~	~~Below Corral Canyon Confluence~~			~~A&We~~			~~PBC~~				~~AgL~~
SC	Harshaw Wash	Headwaters to T22S R16E Sec 15 DAC NW 1/4		A&Ww			FBC			FC		AgL
SC	Harshaw Wash	Below T22S R16E Sec 15 DAC NW 1/4			A&We			PBC				AgL
SC	Kennedy Lake	Municipal Park Lake; Mission Road & Ajo Road, Tucson		A&Ww				PBC		FC		

Changes to Appendix B: Designated Uses of Arizona Water Bodies

~~BASIN~~	SEGMENT	LOCATION	A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Lakeside Lake	Municipal Park Lake; 8300 East Stella Road, Tucson		A&Ww				PBC		FC		
SC	Nogales Wash	Tributary to Potrero Creek		A&Ww				PBC			~~AgI~~	~~AgL~~
SC	Paradise Lake	Near Arizona City		A&Ww			FBC			FC	AgI	
SC	Potrero Creek	Headwaters to Interstate Route 19			A&We			PBC				AgL
SC	Potrero Creek	Below Interstate Route 19		A&Ww			FBC			FC		AgL
~~SC~~	~~Reid Park Lakes~~	~~Urban Lakes; Tucson~~		~~A&Ww~~				~~PBC~~		~~FC~~		
SC	Santa Cruz River (EDW)	Roger Road WWTP outfall to Baumgartner Road				A&Wedw		PBC				~~AgL~~
~~SC~~	~~Silver Bell Lake~~	~~Urban Lake; Tucson~~		~~A&Ww~~				~~PBC~~		~~FC~~		
~~SC~~	~~Sonoita Creek~~	~~Headwaters to the Patagonia WWTP outfall~~		~~A&Ww~~				~~PBC~~		~~FC~~	~~AgI~~	~~AgL~~
~~SC~~	~~Sonoita Creek~~	~~Below the Patagonia WWTP outfall~~		~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
SC	Sonoita Creek	Headwaters to 1 km downstream of the State Route 82 bridge			A&We			PBC				AgL
SC	Sonoita Creek	1 km downstream of the State Route 82 bridge to the Town of Patagonia WWTP outfall		A&Ww			FBC			FC		AgL
SC	Sonoita Creek (EDW)	Town of Patagonia WWTP outfall to 750 feet downstream of outfall				A&Wedw		PBC				AgL
SC	Sonoita Creek	Below 750 feet downstream of Town of Patagonia WWTP outfall		A&Ww			FBC			FC	AgI	AgL
~~SC~~	~~Tanque Verde Creek~~	~~Tributary to Rillito Creek~~		~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
SC	Tanque Verde Creek	Headwaters to Wentworth Road		A&Ww			FBC			FC		AgL
SC	Tanque Verde Creek	Below Wentworth Road			A&We			PBC				AgL

Changes to Appendix B: Designated Uses of Arizona Water Bodies

BASIN	SEGMENT	LOCATION	A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
~~SP~~	~~Aravaipa Creek~~	~~Tributary to the San Pedro River~~		~~A&Ww~~			~~FBC~~		~~DWS~~	~~FC~~		~~AgL~~
SP	Aravaipa Creek	Headwaters to Stowe Gulch		A&Ww			FBC		DWS	FC		AgL
SP	Aravaipa Creek (U)	Stowe Gulch to downstream boundary of Aravaipa Canyon Wilderness Area		A&Ww			FBC		DWS	FC		AgL
SP	Aravaipa Creek	Below downstream boundary of Aravaipa Canyon Wilderness Area		A&Ww			FBC		DWS	FC		AgL
~~SP~~	~~Buehman Canyon Creek~~	~~Southeast slope, Catalina Mountains~~		~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
SP	Buehman Canyon Creek (U)	Headwaters to approximately 9.8 miles downstream at 32°24'31.5" N 110°32'08"W		A&Ww			FBC			FC		AgL
SP	Buehman Canyon Creek	Below 32°24'31.5" N 110°32'08"W		A&Ww			FBC			FC		AgL
SP	Unnamed Wash (EDW)	Mt. Lemmon WWTP outfall to 0.25 km downstream				A&Wedw		PBC				
SR	Pinal Creek	Setka Ranch to Salt River		A&Ww			FBC			FC	~~AgI~~	AgL
~~UG~~	~~Cave Creek~~	~~Eastern slope, Chiricahua Mountains~~	~~A&Wc~~				~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
UG	Cave Creek (U)	Headwaters to Coronado National Forest boundary	A&Wc				FBC			FC	AgI	AgL
UG	Cave Creek	Below Coronado National Forest boundary	A&Wc				FBC			FC	AgI	AgL
UG	Cave Creek, South Fork (U)	Tributary to Cave Creek; Chiricahua Mtns	A&Wc				FBC			FC	AgI	AgL
VR	Cereus Wash	Headwaters to the Ft McDowell Indian Reservation			A&We			PBC				
VR	Colony Wash	Headwaters to the Ft McDowell Indian Reservation			A&We			PBC				

10. A summary of the principal comments and the agency response to them:

The principal comments to the proposed rules and the agency responses to them are organized by Section.

R18-11-101. Definitions

1. Comment: The proposed definition of "surface waters" fails to include a key component of the federal definition of "waters of the United States," namely adjacent wetlands. Under the federal definition, "waters of the United States" includes "wetlands adjacent to waters [other than waters that are themselves wetlands] otherwise defined as waters of the United States under this definition." Also the federal definition extends to all waters which are subject to the ebb and flow of the tide. Although tides are usually associated with oceans, has ADEQ determined whether any Arizona waters [such as lakes] might be subject to tidal influences? If ADEQ is not sure, then the foregoing language from the federal rule should be included in the state definition.

   Response: ADEQ acknowledges that the definition of "surface waters" in the rules differs in some respects from the federal definition of "waters of the United States." In defining "surface water," ADEQ did not adopt the federal definition of "waters of the United States" at 40 CFR 122.2 verbatim. ADEQ made some editorial changes to the federal definition of "waters of the United States" and added some additional examples. However, ADEQ did not intend to propose a substantively different definition. ADEQ intended that the definitions of "surface water," "navigable water," and "waters of the United States" be synonymous. ADEQ agrees that R18-11-101(41)(F) in the proposed rules, which addresses "wetlands," could be interpreted to mean something other than adjacent wetlands. ADEQ revised subsection (F) to be consistent with the parallel subsection in the definition of "waters of the United States" which addresses adjacent wetlands. The adopted rule states at R18-11-101(40)(F) that the term, "surface waters," includes "Wetlands adjacent to waters otherwise defined as surface waters under this definition."

   While the federal definition of "waters of the United States" includes waters that are subject to the ebb and flow of the tide, it is unnecessary to include such language for surface waters in an inland state like Arizona. As the commenter points out, tides are usually associated with oceans. The tide is commonly defined as the periodic variation in the surface level of the ocean and of bays, gulfs, inlets and tidal regions of rivers that is caused by the gravitational attraction of the sun and moon. ADEQ takes notice of the fact that there are no surface waters in Arizona that are subject to the ebb and flow of the tide.

   While Arizonans may devoutly wish a Pacific Ocean coastline with waters that are subject to the ebb and flow of the tide, the state of California remains to the west of the Colorado River. While it is true that large inland bodies of water [e.g., the Great Lakes] may be subject to tidal influence, it is not necessary to include the "subject to the ebb and flow of the tide" language in the definition of "surface water" in R18-11-101. Large interstate or intrastate lakes in Arizona that may be subject to a small tidal influence [e.g., Lake Mead or Lake Powell] are already included by other elements of the definition of "surface water" [e.g., interstate water or intrastate lake].

2. Comment: Phelps Dodge disagrees with the proposal to change the term, "navigable water," to the term, "surface water." The term, "navigable water," has a specific and understood meaning when used in the context of the federal Clean Water Act and state water quality standards [See 33 USC §1362(7); 40 CFR 122.2; 40 CFR 131.3; and A.R.S. § 49-221(A)]. Also, as recognized explicitly by ADEQ, the use of the term, "navigable waters," is consistent with the terminology used in §303(c) of the Clean Water Act. In contrast, the term, "surface water," already has been statutorily defined in Arizona's surface water code [See A.R.S. § 45-101(9)]. The use of the same term for purposes of Arizona's surface water quality standards could cause substantial confusion. Moreover, the definition of "surface water" for purposes of Arizona water law currently is the subject of substantial litigation.

   ADEQ suggests in its preamble to the proposed water quality standards rules that the primary reason forusing the term, "surface waters," rather than the statutorily correct term, "navigable waters," is to avoid confusion in the regulated community. While rule clarity is a commendable objective, it should not outweigh the possible legal ramifications of using a term that is inconsistent with both the federal Clean Water Act and the statutory authority for ADEQ to adopt water quality standards.

   Because of the foregoing concerns, ADEQ should carefully consider other alternatives to the use of the term, "surface water." For instance, ADEQ could resolve its concern over confusion in the regulated community by clarifying in the definition of "navigable waters" that the term may include surface waters that are not navigable-in-fact. ADEQ also should consider using the term, "waters of the United States" in the place of "surface waters."

   Response: ADEQ carefully considered the alternative terms of "surface water," "navigable water" and "water of the United States" for use in the water quality standards rules. Of these alternatives, ADEQ concluded that the term, "surface water," was the most understandable to a general audience. ADEQ believes that the use of a more commonly understood term [i.e., "surface water"] is preferable to using legal jargon [i.e., "navigable water"], especially when the common meaning of "navigable" in "navigable water" suggests a completely different meaning from that which is intended. The term, "navigable water," suggests a water body that is navigable-in-fact. ADEQ believes that this suggested meaning is to be avoided, even when there is a statutory definition of the term, "navigable water" at A.R.S. § 49-201(18). While ADEQ admits that the term, "navigable water," is the statutorily correct term, it is misleading. The real meaning of "navigable waters" under the Clean Water Act is counterintuitive and can be determined only by reference to specific definitions in the Act and in its implementing regulations.

   There should be no confusion over the use of the term, "surface water," in the water quality standards rules. The commonly understood meaning of "surface water" is not misleading and it is more consistent with the actual definition in R18-11-101(40). The inclusion of a specific definition of "surface water" for purposes of the water quality standards rules should pre-

vent confusion. Any statutory definition of "surface water" outside of the water quality standards rules, such as that found in A.R.S. § 49-101(9), is irrelevant. Also, if ADEQ did not revise the water quality standards rules and continued to use the term, "navigable water," the same potential for confusion exists. There are other definitions of the term, "navigable water," outside of the Clean Water Act and the statutory provisions in the Arizona Revised Statutes related to water quality standards. For example, A.R.S. § 37-1101 includes a definition of "navigable" or "navigable watercourse" for purposes of determining the ownership of streambeds in Arizona. That definition is clearly tied to water bodies that were navigable-in-fact at the time of Arizona statehood. However, just as with the definition of "surface water" in A.R.S. § 49-101(9), it has no relevance to the water quality standards rules.

ADEQ has stated in the Notice of Proposed Rulemaking and the preamble to the final water quality standards rules that the use of the term, "surface water," is synonymous with the terms, "navigable water" and "water of the United States." ADEQ also has stated its intent that the use of "surface water" does not change the scope of the water quality standard rules.

3. Comment: The proposed definition of "surface water" is substantially different than the EPA definition of "waters of the United States" in 40 CFR 122.2. For example, in proposed R18-11-101(41)(F), ADEQ includes "wetlands" without any qualifying language within the proposed definition of "surface water." In contrast, the federal counterpart provides that "waters of the United States" includes "wetlands adjacent to waters [other than waters that are themselves wetlands] identified in paragraphs (a) through (f) of this definition."

   Under ADEQ's proposed definition, any area meeting the definition of "wetlands" may be subject to surface water quality standards, even if the area (1) is not an interstate water; 2) could not affect interstate or foreign commerce; or 3) is not adjacent to "waters of the United States." However, if a wetland is not adjacent to a "water of the United States" [i.e., an isolated wetland], it must have a sufficient, independent connection with interstate or foreign commerce in order to qualify as a "water of the United States." This requirement is adequately set forth in subsection C of ADEQ's proposed definition of "surface water." The unqualified use of "wetland" in subsection F is therefore inappropriate and should be modified, consistent with EPA's definition of "waters of the United States." Subsections (D) and (E) of ADEQ's proposed definition of "surface water" should be modified in a similar manner to be consistent with EPA's definition of "waters of the United States."

   ADEQ's proposed changes to subsections (D), (E), and (F) in the proposed definition of "surface water" directly violate state law. A.R.S. § 49-221(B) provides that if ADEQ adopts water quality standards for waters of the state other than navigable waters, ADEQ shall consider the economic, social, and environmental costs and benefits that would result from the adoption of a water quality standard at a particular level or for a particular water category. Consequently, to the extent that subsection (D), (E), and (F) extend beyond EPA's regulatory definition of "navigable waters" or "waters of the United States," ADEQ must consider the economic, social and environmental costs and benefits from such action. It is clear that ADEQ has not undertaken any such consideration. subsections (D), (E), and (F) should be revised by tracking the corresponding language in EPA's definition of "waters of the United States."

   Response: ADEQ agrees that the proposed definition of "surface water" is different from the federal definition of "waters of the United States" at 40 CFR 122.2 in some respects. ADEQ also agrees that the definition of "surface water" should be modified to be consistent with the federal definition of "water of the United States." ADEQ modified subsection (F) of the definition of "surface water" to clarify that the term, "surface water," includes wetlands that are adjacent to waters that are otherwise defined as surface waters under the same definition. ADEQ also agrees that the subsections (D) and (E), which address impoundments and tributaries of surface waters, should be revised so that the definition of "surface water" is consistent with the federal definition of "water of the United States" at 40 CFR 122.2. ADEQ added qualifying language to subsections (D) and (E) to clarify that it is tributaries and impoundments of "surface waters" that are included under the definition.

4. Comment: The Central Arizona Water Conservation District appreciates ADEQ's concern for consistency in terminology by changing "navigable waters" and "waters of the United States" to "surface waters" and assumes that this change is not intended to enlarge the definition of the former terms.

   Response: The use of the term, "surface water," in the water quality standards rules is not intended to enlarge the scope of the water quality standards rules. As stated earlier in this preamble, "surface water" is synonymous with the terms, "navigable water" and "water of the United States."

5. Comment: EPA recommends the deletion of the definition for the term, "fast land." Discussion of the legal conversion of waters of the United States is contained in comments regarding R18-11-102(B)(2).

   Response: ADEQ agrees that the definition of the term, "fast lands," should be deleted from R18-11-101 because it is not clear what the legal consequences of the proposed definition may be for the implementation of the dredge and fill permit program under §404 of the Clean Water Act. EPA has indicated that because of this uncertainty, the mining impoundment exclusion at R18-11-102(B)(2) may not approvable. To avoid a possible EPA disapproval, ADEQ deleted the definition of "fast lands."

6. Comment: ASARCO strongly supports the addition of the definition for the term, "fast lands" as a way to help understand when the surface water quality standards do not apply to man-made mining impoundments. It may be useful to cite more fully, or add a definition of, the term §404.

   Response: ADEQ disagrees. EPA has expressed concern that the proposed definition of "fast lands" creates uncertainty with respect to the implementation of the §404 permit program. Because of this uncertainty, EPA has indicated that the definition of "fast lands" and the mining impoundment exclusion may not be approvable. To avoid a possible EPA disapproval of the mining impoundments exclusion, ADEQ has deleted the reference to "fast lands" in the rules.

R18-11-102. Applicability

7. Comment: The waste treatment system exclusion at R18-11-102(B) is a positive addition to the state water quality standards. This revision will allow municipalities to take advantage of constructed wetlands for highly effective nutrient removal. However, because of water rights issues related to the use of constructed wetlands, ADEQ should expand the exclusion. First, constructed wetlands should be classified as waste treatment systems. Second, the waste treatment system exclusion should clarify that the use of created wetlands for purposes of wastewater treatment will not jeopardize the water rights of communities that use such systems. The fact that a temporary aquatic habitat may be created through the use of constructed wetlands should not limit a municipality's future options for complete reuse, resulting in abandonment of the constructed wetland, should such a change in water resource management become desirable.

   Response: ADEQ disagrees that the waste treatment system exclusion should be expanded. As stated in the preamble, the source of the waste treatment system exclusion is the federal definition of "waters of the United States" [See 40 CFR 122.2]. Water quality standards do not apply to waste treatment systems because they are not considered to be "waters of the United States." ADEQ cannot expand the waste treatment system exclusion beyond what is excluded in the federal definition of "waters of the United States."

   The only difference between the waste treatment system exclusion as adopted by the state in R18-11-102(B)(1) and the definition of "waters of the United States" at 40 CFR 122.2 is the specific inclusion in the state rule of "constructed wetlands" as an example of a waste treatment system. ADEQ agrees that constructed wetlands may be a part of a wastewater treatment system. The adopted rule clarifies this by specifically including "constructed wetlands" as an example. ADEQ cannot address water rights issues through the water quality standards rules.

8. Comment: The state should simply reference the relevant federal definition in 40 CFR 122.2 rather than attempting to restate the definition to exclude the suspended language. EPA may at some point end the suspension, and the state cannot in any event use a definition of "waters of the United States" that is narrower than the federal rules.

   Response: ADEQ does not think that an incorporation of the relevant federal definition of "waters of the United States" at 40 CFR 122.2 by reference is wise. First, an incorporation by reference without publishing the text of the incorporated matter in full is allowed only if incorporation of the text would be unduly cumbersome, expensive, or otherwise inexpedient [See A.R.S. § 41-1028(A)]. In this case, it is not unduly cumbersome, expensive, or inexpedient to include the full text of the definition of "surface water" in the rule.

   Second, the definition of "surface water" and the relevant federal definition of "waters of the United States" upon which it is based are critical to an understanding of the scope of the water quality standards rules. The full text of the definition of "surface water" and the waste treatment system exclusion should appear in the water quality standards rules, not a cross-reference to definition of "water of the United States" in the Code of Federal Regulations. As a general rule, ADEQ believes that incorporations by reference in rules should be limited so that the rules are understandable standing alone, without reference to other codes, standards or regulations.

   In ADEQ's view, a clear statement of the applicability of water quality standards in R18-11-102 and the definition of a critical jurisdictional term in R18-11-101 are preferable to determining the applicability of state-adopted water quality standards by an incorporation by reference of the federal definition of "waters of the United States."

   Finally, the EPA suspension of the location restriction language in the waste treatment system exclusion has been in effect since 1980 and there is no indication that EPA is going to initiate a federal rulemaking to lift it. If EPA lifts the suspension of the language at some point in the future, ADEQ can revise the waste treatment system exclusion in the rules in a future triennial review.

9. Comment: The City of Phoenix supports the elimination of the 2nd sentence from the waste treatment system in order to provide more regulatory flexibility. As exemplified in the preamble to the proposed water quality standards rules, constructed wetlands are becoming a viable means of wastewater treatment and effluent polishing as well as ecological enhancement, especially in effluent dependent streams. This provision helps support continued discharge of effluent to maintain riparian habitat, where in its absence, wastewater utilities would be compelled to put the effluent to more beneficial reuse.

   Response: ADEQ agrees that the repeal of the 2nd sentence from the waste treatment system exclusion will provide flexibility and may remove a regulatory barrier to the use of constructed wetlands for wastewater treatment.

10. Comment: EPA acknowledges that the language deleted from the waste treatment exclusion by Arizona is consistent with the federal suspension of language in 40 CFR 122.2 contained at 45 FR 48620 (July 21, 1980).

    Response: Since the repeal of the language in the state-adopted waste treatment system exclusion is consistent with the federal suspension of the same language in the definition of "water of the United States" at 40 CFR 122.2, the adopted rule should be approvable by EPA.

11. Comment: Phelps Dodge supports ADEQ's proposal to delete the last sentence from the waste treatment system exclusion. This is consistent with EPA's longstanding suspension of the same language from the regulatory definition of "waters of the United States." EPA's decision was based upon a careful policy decision that is should regulate discharges from such systems, rather than into such systems, regardless of location.

    Response: ADEQ and EPA both agree that the deletion of the 2nd sentence from the waste treatment system exclusion is consistent with the federal definition of "waters of the United States." The suspended language does not appear in the adopted

rule.

12. Comment: The Town of Patagonia supports the waste treatment system exclusion from the water quality standards. The town is looking at its wastewater treatment options, and 1 option being considered is a constructed wetlands. Compliance with water quality standards should be determined at the point of discharge from the constructed wetlands, rather than at the point of discharge into the constructed wetlands.

    Response: As stated in the preamble to this rulemaking, 1 of the reasons for deleting the 2nd sentence from the waste treatment system exclusion is to remove a potential regulatory barrier to the use of constructed wetlands for wastewater treatment. ADEQ is pleased that this repeal preserves 1 of the Town of Patagonia's wastewater treatment options.

13. Comment: The Arizona Municipal Water Users Association [AMWUA] supports the revised waste treatment exclusion at R18-11-102(B)(1).

    Response: ADEQ appreciates AMWUA's statement of support. ADEQ adopted the waste treatment system exclusion as proposed.

14. Comment: Phelps Dodge supports ADEQ's proposed revisions to the mining impoundment exclusion. We agree that EPA's disapproval of the mining impoundment exclusion did not require the repeal of the currently effective rule. Phelps Dodge also believes that the revised mining impoundments exclusion resolves EPA's concern that the exclusion could extend to water bodies that may otherwise qualify as "waters of the United States."

    Response: In the last triennial review of the state's water quality standards, EPA disapproved the currently effective mining impoundment exclusion. In disapproving the exclusion, EPA gave the state 2 options: 1) repeal the mining impoundments exclusion; or 2) "otherwise revise its regulations in order that those impoundments which are 'waters of the United States' are governed by appropriate water quality standards." [See EPA disapproval letter dated September 9, 1993, p. 2].

    ADEQ proposed revisions to the language of the currently effective mining impoundment exclusion in an attempt to retain the exclusion but clarify that mining-related impoundments which are "waters of the United States" are governed by appropriate water quality standards. The proposed rule stated that water quality standards do not apply to manmade mining impoundments "... that are located either on lands that were not and are not surface waters or that are located on fast lands." The intent of the proposed revision was to condition the mining impoundments exclusion with location restrictions to ensure that mining impoundments that are "waters of the United States" are subject to state-adopted water quality standards.

    The 1st of these conditions [i.e., "that are located either on lands that were not and are not surface waters"] was not controversial. There is general agreement among EPA, ADEQ, mining industry representatives, and other commenters that a manmade mining impoundment that is originally created outside of what would be otherwise be considered a "surface water" [i.e, a "water of the United States"] is not a "surface water" or "water of the United States" that is subject to water quality standards. For example, water quality standards would not apply to a manmade tailings impoundment that is originally created in an upland area outside of any intermittent or ephemeral streams, washes, etc. EPA articulated this viewpoint in its original disapproval of the mining impoundments exclusion when it acknowledged that most mining-related impoundments are not subject to water quality standards because they are located outside of "waters of the United States."

    The 2nd proposed condition [i.e, "or that are located on fast land"] is problematic because it creates legal uncertainty. ADEQ's intent in proposing the "fast lands" language was to extend the mining impoundments exclusion to a manmade mining impoundment that is created originally by the discharge of dredge and fill material into what may be considered a "surface water" or "water of the United States," but which legally converts that surface water into an impoundment that is not subject to Clean Water Act jurisdiction. For example, the excavation of a dry wash to create a basin for a tailings impoundment would require a §404 permit. Any discharge from the tailings impoundment to a surface water would require a NPDES permit. However, the tailings impoundment itself would no longer be considered a surface water and water quality standards would not apply.

    ADEQ proposed a definition for "fast land" at R18-11-101(24). In the proposed definition, ADEQ attempted to articulate a concept of the "legal conversion" of a surface water to dry land under §404 of the Clean Water Act. Under this concept, a manmade mining impoundment, created by the discharge of dredge and fill material and permitted under §404 of the Clean Water Act, would no longer be considered a "surface water" or a "water of the United States" and water quality standards would not apply. The proposed definition of "fast lands" also extended to the creation of manmade mining impoundments under certain exemptions to §404 permit program requirements and to impoundments that were created before there were any §404 permit requirements. The latter provision was intended to essentially "grandfather" manmade mining impoundments that had been created by the discharge of dredge and fill material before the creation of the §404 permit program.

    The proposed definition of "fast lands" raised numerous questions and created legal uncertainty with regard to consequences for the §404 permit program. For example, it was not clear whether the phrase "was authorized by a §404 permit" at R18-4-101(24)(a) included both individual and nationwide §404 permits. Also, it was not clear how the recognized exemptions from §404 permit requirements related to the creation of manmade mining impoundments. Finally, there was uncertainty regarding the legality of a blanket exclusion for "grandfathered" impoundments that were created before there were §404 permit requirements. Because of these uncertainties and the unknown impact on the §404 permit program, EPA indicated that the revised language of the mining impoundment exclusion and the proposed definition of "fast lands" may not be approvable.

    In an attempt to resolve EPA concerns regarding the definition of "fast lands" and the concern that the mining impoundment exclusion may extend to water bodies that may otherwise qualify as "surface waters" or "waters of the United States," ADEQ

deleted the definition of "fast lands" and revised the proposed rule as follows:

Man-made surface impoundments and associated ditches and conveyances used in the extraction, benefication and processing of metallic ores...that are not surface waters or are located in areas that once were surface waters but no longer remain surface waters because they have been and remain legally converted.

The revised language extends the mining impoundments exclusion only to impoundments that are not "surface waters" or "waters of the United States." It also preserves the concept of the legal conversion of a surface water to a water body that is not subject to Clean Water Act jurisdiction.

15. Comment: ASARCO strongly supports the Department's decision to retain a mining impoundment exclusion to the surface water quality standards. ASARCO has some concerns that the language that references "lands that were not and are not surface waters" could be interpreted to mean that impoundments which have been created in areas that never were "waters of the United States" still constitute "waters of the United States" in some way.

    Response: ADEQ agrees that the mining impoundment exclusion should be retained. ADEQ has revised the rule to eliminate the reference to "lands that were not and are not surface waters." While the language of the revised mining impoundments exclusion may still require interpretation on a case-by-case basis, ADEQ believes that it provides useful guidance as to the types of manmade mining impoundments that are not considered to be "surface waters" or "waters of the United States."

16. Comment: The state's proposed mining impoundments exclusion is broader than allowed under federal law. There is no blanket exemption under the federal law for impoundments located on "fast lands." The only way to ensure consistency with federal law is to allow exemption of mining impoundments only to the extent that such impoundments are not "waters of the United States," as defined by federal law, and are not located within such waters. The proposed federal promulgation properly addresses this issue and should be followed by the state. Contrary to the state's assertion, EPA's 1993 disapproval of the mining impoundments exclusion definitely requires repeal of the currently effective rule.

    Response: ADEQ agrees that federal law does not contain a specific exclusion for manmade mining impoundments. The mining impoundments exclusion adopted by the state is an extension of the waste treatment system exclusion found in the federal definition of "waters of the United States" at 40 CFR 122.2. ADEQ believes that revisions to the language of the mining impoundment exclusion in the adopted rule clarify that the exclusion applies only to manmade mining impoundments to the extent that they are not "surface waters" or "waters of the United States." The adopted rule incorporates language recommended by EPA which EPA has stated is approvable [See Comment #17].

    ADEQ disagrees that EPA's disapproval of the mining impoundments exclusion on September 9, 1993, requires the repeal of the currently effective rule. The state's options with regard to the EPA disapproval were clearly stated in the alternative. EPA said in its disapproval letter: "In order for the water quality standards to be approvable pursuant to §303(c), the State must delete this provision from the adopted standards, or otherwise revise its regulations in order that those impoundments which are 'waters of the United States' are governed by appropriate standards" [Emphasis added].

17. Comment: EPA recommends the following language for the mining impoundments exclusion: Man-made surface impoundments...that are located on lands that are not surface waters or are areas that once were surface waters but no longer remain surface waters because they have been and remain legally converted.

    EPA believes that the revision by the state of this Section of the standards in the manner described above would be approvable should the revision be submitted to EPA under §303(c) of the Clean Water Act. Regarding the reference in the language to waters that are "legally converted," EPA staff have outlined in recent discussions with staff of ADEQ that EPA has in certain cases found that "waters of the United States" can be legally converted and removed from Clean Water Act jurisdiction under certain circumstances.

    Response: ADEQ revised the mining impoundments exclusion at R18-11-102(B)(2) to incorporate the language recommended by EPA.

18. Comment: The proposed mining impoundments exclusion exempts such impoundments that are located on "fast lands." What is the purpose of adding "fast lands" to the exclusion? If it was once a surface water, couldn't the legal conversion to land conflict with its physical characteristics? If every impoundment that was authorized by a §404 permit is no longer considered a surface water, even if it may be in the "old" channel, couldn't you run into a situation of a heap leach pad or other toxic impoundment that needs to be watched carefully after mining operations cease to be sure it doesn't seep into groundwater, surface water, or a "water of the United States? ADEQ should reconsider the "fast land" exemption because the state may just add another confusing quirk to the law and at the same time fail to adequately protect surface waters from contamination.

    Response: ADEQ has reconsidered the "fast lands" definition. For the reasons stated in a response to a Comment #14, ADEQ deleted the reference to "fast lands" from the mining impoundments exclusion. The revised language of the exclusion states that manmade mining impoundments are exempt from water quality standards only if they are either not surface waters or "they have been and remain legally converted" [Emphasis added]. It is possible, but unlikely, that the exemption from water quality standards for a manmade mining impoundment could be lost after the cessation of mining operations because a manmade mining impoundment reverts back to the status of a "surface water" or a "water of the United States." ADEQ thinks that this is an unlikely possibility because the impoundments covered by the exclusion also are covered by closure requirements mandated by other state environmental protection programs [e.g., aquifer protection permit program, mined land reclamation programs]. Many of the manmade mining impoundments that are excluded pursuant to R18-11-102(B)(2) will cease to exist as a result of closure activities undertaken pursuant to these other regulatory programs.

R18-11-104. Designated Uses

19. Comment: ASARCO supports the revision to R18-11-104(H)(2) which refers to compensation of low flow conditions by the discharge of treated wastewater. ASARCO supports the proposed change as it eliminates confusing language.

    Response: ADEQ agrees. ADEQ repealed the language in R18-11-102(H)(2) which refers to compensation of low flow conditions by the discharge of treated wastewater because the language of the subsection is internally contradictory. R18-11-102(H)(2) provides the grounds for the removal of a designated use if natural, ephemeral, intermittent, or low flow conditions prevent the attainment of a use *provided such conditions cannot be compensated for by the discharge of effluent.* The subsection then goes on to state that nothing within it "*shall be construed to require releases of treated wastewater.*" These 2 statements are contradictory and confusing. The repeal of the 2 inconsistent statements results in a more concise and understandable rule.

20. Comment: Arizona's water quality standards contain stringent provisions for removing a designated use from a water segment. Such an action can be accomplished only by performing a use attainability analysis. In contrast, the state can add additional designated uses to a water segment without having to make any particular showing. In many instances, the designated uses have been improperly assigned or no longer exist. Accordingly, the water quality standards rules should provide greater flexibility for redesignating uses that have been inappropriately assigned. Cyprus Climax believes that a use should not be initially designated for a particular water body if the use is illegal, casual, unintended, or is simply not occurring. Similarly, if a use is illegal, casual, unintended, or simply does not exist, but already has been designated for a water body, the process for removing the use should not require the preparation of a detailed use attainability analysis.

    Response: R18-11-104 addresses the designation and removal of uses that have been established for Arizona surface waters. The designated use rule is consistent with the Clean Water Act and its implementing regulations. ADEQ's ability to provide "greater flexibility for redesignating uses that have been inappropriately assigned" is limited by the requirements of Clean Water Act.

    The designated uses rule must comply with the minimum requirements prescribed in 40 CFR 131.10 in order to be approvable by EPA. The state is required by state and federal law to designate uses for Arizona surface waters considering, at a minimum, the use and value of the surface water for public water supplies; the propagation of fish, shellfish, and wildlife; recreation in and on the water; agricultural, industrial, and other purposes, including navigation. When designating uses for a surface water, ADEQ must consider the water quality standards that have been established for downstream surface waters and ensure that the downstream water quality standards are maintained and protected.

    Under the Clean Water Act, the state has a certain amount of flexibility to develop subcategories of designated uses to reflect the varying needs in Arizona surface waters. The state has taken advantage of this flexibility to adopt subcategories of aquatic and wildlife designated uses for cold and warm water fisheries, effluent dependent waters, and ephemeral waters.

    The Clean Water Act requires the designation of uses specified in §101(a)(2) of the Act where those uses are attainable. The uses specified in §101(a)(2) are those which implement the "fishable/swimmable" goals of the Clean Water Act. ADEQ is required by law to establish designated uses which provide water quality for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water. In Arizona, this means that ADEQ must designate 1 of the aquatic and wildlife uses [A&W], fish consumption [FC], and either full body contact [FBC] or partial body contact [PBC] for a surface water or conduct a use attainability analysis to justify the omission of those designated uses. In establishing designated uses for a surface water, the critical state determination is whether a use is attainable. The legality of a use or whether the use is casual or intended are not relevant considerations in establishing designated uses for surface waters.

    Once a designated use has been established for a surface water, that surface water cannot be reclassified for a different designated use except under specific conditions that are prescribed in the Clean Water Act's implementing regulations [See 40 CFR 131.10(g)]. The state is required by law to conduct a use attainability analysis to remove a designated use. The state cannot avoid the use attainability requirement because a use is illegal, casual, or unintended. If a designated use is an existing use, it cannot be removed. Moreover, a designated use can only be removed if it is demonstrated that 1 of the factors prescribed in 40 CFR 131.10(g) are met. Again, a designated use cannot be removed because it is casual, unintended, or even illegal.

    Because of these Clean Water Act requirements, ADEQ cannot revise the designated uses rule to provide more flexibility in establishing or removing designated uses for the reasons suggested by the commenter.

R18-11-105. Tributary

21. Comment: The new tributary rule is a substantial improvement over the currently effective rule. However, the new tributary rule does not entirely accomplish the goal of avoiding the application of inappropriate water quality standards to unlisted tributaries. Phelps Dodge is concerned that the new tributary rule may result in the application of stringent numeric standards to unlisted perennial or intermittent tributaries that have no relationship to the existing or attainable uses of the waterway. The new tributary rule would apply the designated use of fish consumption to all unlisted perennial tributaries, as well as the designated uses established for the nearest downstream water that is not an ephemeral or effluent dominated water, regardless of whether such uses are actually existing or attainable in the unlisted tributaries. Such a result is especially troublesome because once a use is designated for a particular water body, removal of the use or adoption of a subcategory of a designated use with less stringent criteria is extremely difficult. Consequently, ADEQ should not apply fish consumption or other designated uses to unlisted perennial tributaries without an adequate showing that such uses are existing or attainable.

    Response: The establishment of the fish consumption [FC] designated use for unlisted tributaries that are perennial or inter-

mittent and either cold water or warm water fisheries by the tributary rule is consistent with the §101(a)(2) goals of the Clean Water Act and the approach taken by ADEQ in establishing designating uses for surface waters that are listed in Appendix B and have the A&Wc and A&Ww designated uses. Moreover, it is logical from a public health perspective to establish the FC designated use to protect persons who may consume fish or other harvestable aquatic organisms taken from an unlisted tributary that is either a cold or warm water fishery. The establishment of the designated uses for the nearest downstream surface water to an unlisted tributary is consistent with ADEQ's duty to ensure that downstream water quality standards are maintained and protected.

In order to be consistent with §101(a)(2) of the Clean Water Act, the fish consumption [FC] designated use must be designated for a surface water or a use attainability analysis conducted to justify its omission. In this triennial review, ADEQ submitted use attainability analyses to justify the omission of the FC designated use in ephemeral waters and effluent dependent waters. ADEQ believes that the categorical UAA for ephemeral waters justifies the omission of the FC designated use for unlisted tributaries that are ephemeral waters in the tributary rule.

In this triennial review, ADEQ is establishing the FC designated use for those surface waters listed in Appendix B which have either an aquatic and wildlife [cold water fishery] or an aquatic and wildlife [warm water fishery] designated use, but which does not have the FC designated use. The tributary rule is consistent with this approach because it also establishes the FC designated use for all unlisted tributaries that are not ephemeral waters or effluent dependent waters and which have salmonids or other harvestable aquatic organisms present.

22. Comment: ASARCO strongly supports changes to the tributary rule and agrees with the Department that these changes will prevent the application of inappropriate water quality standards to unlisted tributaries. In particular, ASARCO believes it makes sense to avoid applying water quality standards for perennial waters to unlisted tributaries that are not perennial themselves.

    Response: The revised tributary rule will result in the establishment of more appropriate water quality standards for unlisted tributaries. For example, the adopted tributary rule will prevent the application of water quality standards that have been established for downstream perennial waters to upstream tributaries that are ephemeral waters.

23. Comment: Pima County concurs with the proposed changes to the tributary rule.

    Response: ADEQ adopted the tributary rule as proposed.

24. Comment: It makes sense that upstream unlisted tributaries not automatically have the "default" standard of the nearest downstream surface water that is listed in Appendix B of the rules. However, there are so many instances of dry washes becoming flooded and sweeping whatever is in them to the perennial or intermittent stream below that it would be unfortunate to allow a municipality, corporation or individual to pollute a surface water just because it is difficult to frame a rule that will address all situations. The state should write a rule which will be sure to afford adequate protection to downstream waters.

    Response: ADEQ agrees with the commenter that it is difficult to frame a rule that will address all situations. ADEQ would go farther and admit that no rule can address all situations. The tributary rule establishes appropriate water quality standards for unlisted tributaries by default. The rule is intended to provide a minimum level of water quality protection for surface waters that are not specifically listed in Appendix B. ADEQ believes that the establishment of these water quality standards will afford adequate water quality protection to downstream waters in most cases.

    Under the Clean Water Act its implementing regulations and the currently effective water quality standards rules, ADEQ is required to take into consideration the water quality standards of downstream waters and ensure that the water quality standards that are established for an upstream surface water provide for the attainment and maintenance of the water quality standards that have been established for downstream waters [See 40 CFR 131.10(b) and R18-11-104(F) in the adopted rules]. This duty extends to water quality standards that are established for a surface water through the tributary rule.

    ADEQ believes that the water quality standards that are established by the tributary rule will protect water quality in downstream surface waters in most cases. In those cases where the default standards prove to be inadequate to protect downstream surface waters, ADEQ can always list the tributary in Appendix B and establish designated uses for it which will ensure compliance with the downstream standards.

    Ideally, there would be no need for a tributary rule. Every surface water in Arizona, including all the tributaries, would be specifically listed in Appendix B with their designated uses. However, it is not practicable to list all of the small and unnamed tributaries in Arizona. Even if ADEQ listed every tributary in Arizona, including 2nd and 3rd-order tributaries, ADEQ believes that the resulting designated uses for those tributaries would be equivalent to the default water quality standards that are established through the tributary rule. For example, if ADEQ listed each small tributary that is an ephemeral water in Appendix B, it is highly unlikely that ADEQ would establish the water quality standards that apply to the nearest downstream perennial water to each ephemeral water. In all probability, ADEQ would rely on the categorical use attainability analysis that has been done for ephemeral waters and list the A&W [ephemeral] and partial body contact designated uses for each new tributary.

    The only way to completely ensure that downstream water quality standards are met is to establish the same or more stringent water quality standards for all unlisted tributaries that are upstream. While the implementation of this "blanket" approach ensures compliance with all downstream water quality standards, it results in the establishment of designated uses for upstream tributaries without any consideration of whether such uses are attainable. The adopted rule takes use attainability into account. It is consistent with the categorical use attainability analysis that was done to support the designated uses for

ephemeral waters that are listed in Appendix B. Moreover, the tributary rule establishes, by default, appropriate water quality standards for unlisted, perennial tributaries that are adequately protective.

25. Comment: The revisions to the tributary rule also are an improvement. The current rule could result in water quality standards for perennial streams being applied to dry streambeds.

    Response: ADEQ believes that the revised tributary rule is an improvement over the currently effective rule and will prevent the application of water quality standards that have been established for downstream surface waters that are perennial or intermittent to upstream tributaries that are ephemeral.

26. Comment: The proposed revision of the tributary rule is contrary to federal law and regulations, and would represent a major weakening of environmental protection. It would effectively downgrade the protected use status of hundreds of tributaries without performing the use attainability analysis required by EPA rules. Further it would effectively leave these tributaries without any definite standards at all. Although the proposed rule lists various possible use designations for unlisted tributaries, those designations require determinations or fact findings as to each tributary before they will apply. For example, we will not know if tributary "X" should be protected as an aquatic and wildlife [cold water fishery] until someone determines that the tributary has salmonids and is not ephemeral or effluent dominated. A major purpose of the tributary rule is to avoid such uncertainty. The tributary rule also is designed to ensure the protection of uses in the nearest downstream waters that are listed. The proposed rule would obliterate that protection.

    Response: ADEQ disagrees that the tributary rule represents a downgrade of water quality standards or a major weakening of environmental protection. ADEQ believes that the adopted tributary rule results in more rational and more appropriate use designations than the currently effective rule. Moreover, the categorical use attainability analysis which has been done for ephemeral waters by ADEQ supports the designated uses that are established by default through the tributary rule.

    While the tributary rule requires that certain findings of fact be made to determine which water quality standards apply, ADEQ does not believe that this leaves unlisted tributaries without any water quality standards. When a question arises about the application of water quality standards to a specific tributary, it should not be difficult to determine whether the tributary is an ephemeral water, has perennial flow or whether the tributary supports a cold water or warm water fishery. Also, ADEQ believes that most of the perennial surface waters in Arizona that are cold or warm water fisheries are already specifically listed in Appendix B and that there will be few occasions where such fact determinations will need to be made. In most cases, the only fact determination that will need to be made is whether a specific tributary is an ephemeral water. This is easily determined from field observations, local depth-to-groundwater data, or even hydrological maps.

R18-11-106. Net Ecological Benefit

27. Comment: The inclusion of R18-11-106 relating to net ecological benefit is wholly inappropriate and should be removed from the proposed rules. Inclusion of this Section is an adoption of nonbinding federal guidance as a state regulation. If Arizona desires to consider net ecological concepts, they should be developed through guidance documents, at least initially, in the same manner as federal guidance so they can be tested and modified as needed.

    Response: ADEQ disagrees that the proposal of the net ecological benefit rule is inappropriate. The commenter is correct that the net ecological benefits rule is modeled on EPA Region IX guidance documents which address the same subject matter. However, ADEQ is not prohibited from using EPA guidance as a basis for the development of a state rule. On the contrary, ADEQ has a statutory duty to consider guidelines that have been adopted or recommended by the U.S. Environmental Protection Agency as well as the unique physical, biological, or chemical properties of Arizona's surface waters in setting standards [See A.R.S. § 49-221(C)(5) and (6)].

    While ADEQ is sympathetic to the argument that the net ecological benefit concept should be developed initially through a guidance document [ADEQ has made the same argument with regard to other water quality standards implementation procedures], ADEQ believes that the promulgation of a net ecological benefit rule in this triennial review is necessary. The intent of the rule is to provide the grounds for a modification of a water quality standard. Under A.R.S. § 49-221(A), a water quality standard can be adopted or modified only by rule. Consequently, ADEQ believes that the net ecological grounds for modification of a water quality standard also must be in rule.

    ADEQ acknowledges that there is a need for supplementary guidance to explain the elements of the rule and how it will be implemented. EPA Region IX's existing guidance documents on net ecological benefit may be used as a starting point for interpreting the state rule. The existing EPA guidance documents are: *"EPA Region IX, Interim Final Guidance for Modifying Water Quality Standards and Protecting Effluent Dependent Ecosystems"* [June 1992] and *"Supplementary Guidance on Conducting Use Attainability Analyses on Effluent Dependent Ecosystems,"* [March 1993]. ADEQ views the promulgation of this rule as part of an iterative process. As the state gains experience with the implementation of the net ecological benefit concept, necessary modifications to the rule may become evident and can be made in a future triennial review.

28. Comment: The proposed net ecological benefits rule is rife with vague terms and misleading language such as "ecologically valuable," "more cost effective to eliminate the discharge of effluent than to upgrade treatment," "feasible for a point source discharger to completely eliminate the discharge of effluent," and "all practicable point source discharge control programs." It will never be possible to secure consensus on the application of such terms between Arizona and EPA unless such terms are defined in a guidance document. For this reason, the net ecological benefit concept should be removed from the water quality standards and placed in a guidance document, if they are to be used at all.

    Response: ADEQ acknowledges that there is a need for supplementary guidance to explain the elements of the rule and how

it will be implemented. However, ADEQ does not believe the rule is void for vagueness. EPA Region IX's existing guidance documents on net ecological benefit may be used as a starting point for interpreting the provisions of the state rule.

29. Comment: The city of Phoenix supports forwarding the concept of net ecological benefit into rule as a means of modifying water quality standards where such a benefit can be demonstrated. This is another mechanism to provide flexibility to ADEQ and the regulated community to allow for multiple uses of the state's water resources, including the maintenance of riparian or aquatic habitat.

    Response: The primary purpose of the net ecological benefit rule is to provide regulatory flexibility in the water quality standards rules regarding effluent dependent ecosystems. The net ecological benefit rule will allow the modification of a water quality standard where it is necessary to maintain an effluent dependent ecosystem. The adoption of this rule will provide the necessary regulatory flexibility to preserve and maintain in-stream flows which support such ecosystems. ADEQ believes that adoption of this rule is important because Arizona has lost a large percentage of its riparian and aquatic habitat.

30. Comment: The Game and Fish Department supports the adoption of R18-11-106 to allow modification of a water quality standard where it can be demonstrated that there is a net ecological benefit from the discharge of effluent to a riparian or aquatic habitat. We note that the draft rule includes 6 points to be demonstrated regarding effects of modifying the standards. In some areas, effluent supports relic or surrogate patches of habitat which provide wildlife habitat functions once much more common along our watercourses.

    Response: ADEQ agrees. Hopefully, the rule will provide a regulatory incentive to preserve effluent dependent ecosystems and wildlife habitat.

31. Comment: ASARCO supports the inclusion of the net ecological benefit rule. ASARCO believes it promotes good stewardship of a very limited resource in Arizona - water.

    Response: ADEQ agrees.

32. Comment: The Towns of Patagonia and Nogales support the concept of allowing modification of water quality standards on grounds of net ecological benefit. However, the proposed rule is vague in many respects and this may limit its implementation as well as an applicant's incentive to apply for a modification.

    Response: The net ecological benefit concept represents a new and untested grounds for the modification of a water quality standard. As with any new regulatory concept, the rule 1st prescribes general criteria. ADEQ acknowledges that the rule may need to be amended in the future to address specific issues that arise during its implementation. ADEQ also acknowledges that the net ecological benefit rule needs specific implementation guidance to explain its various elements and how it is to be used by the regulated community. Such guidance already exists. The net ecological benefit rule is based upon 2 existing EPA guidance documents [i.e., "*EPA Region IX, Interim Final Guidance for Modifying Water Quality Standards and Protecting Effluent Dependent Ecosystems*" [June 1992] and *"Supplementary Guidance on Conducting Use Attainability Analyses on Effluent Dependent Ecosystems,"* [March 1993]. These EPA guidance documents include information on when to use the net ecological benefit concept and how to make the required demonstrations. ADEQ believes that the adopted rule and these implementation guidances provide the necessary detail to effectively implement the rule.

33. Comment: The proposed Net Ecological Benefit rule has a number of serious flaws. The most significant problem is that the rule purports to allow the Director to modify a water quality standard without EPA approval. Under federal law, all state revisions to water quality standards must be submitted to EPA for review and approval or disapproval [33 USC §1313]. Further, the rule does not require rulemaking or other public participation procedures at the state level before the Director grants a modification. Under state law, the modification of a water quality standard would constitute rulemaking, thus requiring that rulemaking procedures be followed.

    Response: ADEQ agrees with both criticisms of the proposed net ecological benefit rule. ADEQ revised the rule to clarify that the modification of a water quality standard on the ground of net ecological benefit can be accomplished only through rulemaking. It is not necessary to revise the rule to clarify that the modification of the water quality standard on the ground of net ecological benefit is subject to EPA review and approval as this is already addressed by federal regulation [See 40 CFR 131.20].

34. Comment: The Net Ecological Benefit rule departs in several significant respects from the relevant EPA Region IX guidance on this issue [See Guidance for Modifying Water Quality Standards and Protection of Effluent Dependent Ecosystems - Interim Final (1992)]. The EPA guidance document requires the discharger to document that a feasible plan to remove the discharge is actually under consideration. In contrast, the ADEQ proposal merely requires a showing that removal of the discharge is feasible [even if it is not under consideration]. The ADEQ proposal should be modified to require a showing that removal of the effluent is under active and serious consideration [including development of specific design plans] for implementation within a definite, near term time frame. Otherwise dischargers will be able to assert that they are planning some other use of the discharge even when they really are not.

    Response: ADEQ agrees. ADEQ revised the language of the rule to require that a discharger demonstrate that a feasible plan to remove a discharge of effluent is under active consideration.

35. Comment: The EPA guidance document on net ecological benefit requires a commitment from the discharger to provide effluent to the stream that is sufficient to protect and maintain the ecological benefit as determined by EPA and state and federal wildlife agencies. The commitment to provide continued effluent to the stream must be a legally enforceable 1, via a

NPDES permit condition or similar mechanism. The ADEQ proposal contains no such requirement. Thus, under the ADEQ proposal, the state could weaken standards and the discharger would still be free to dry up the river.

Response: The EPA Guidance document on net ecological benefit is advisory only. It *recommends* that a discharger be required to commit to providing effluent to a stream in order to preserve the net ecological benefits associated with that discharge before a use attainability analysis based on net ecological benefit may be approved. While a legally enforceable commitment to continue the discharge of effluent to the stream may be desirable as a quid pro quo for a water quality standard modification, it is not clear that ADEQ has the legal authority to require such a commitment as a precondition. Also, it is not clear what legal mechanism could be used to enforce the commitment. ADEQ does not have primacy over the NPDES permit program so ADEQ's authority to require a commitment to discharge effluent as an NPDES permit condition is unclear. It may be possible for the state and a discharger to enter into a legally enforceable contract which requires a continued discharge of effluent for a certain term in exchange for a water quality modification. However, ADEQ is unaware of any precedent for such an agreement. Given these legal uncertainties, ADEQ declines to require a discharger to make a legally enforceable commitment to provide effluent in the rule.

36. Comment: The discharger should be required to show that it is substantially more cost effective to eliminate the discharge of effluent than to meet the relevant standard. A small or minor cost benefit should not justify weakening of standards.

    Response: ADEQ disagrees. If ADEQ insists upon a demonstration that the elimination of a discharge is substantially more cost effective than upgrading treatment to comply with an applicable standard, then where the cost of upgrading treatment may be relatively small but it is still more cost effective to eliminate a discharge rather than incur the cost of upgrading treatment, a point source discharger will have no incentive to continue the discharge and preserve the effluent dependent ecosystem. ADEQ believes that a discharger will choose the most cost effective option and eliminate the discharge of the effluent because of "bottom line" considerations. A requirement to demonstrate a substantial cost savings may defeat the purpose of the rule. ADEQ believes that the modification of a water quality standard on net ecological benefit grounds should be an available option even when elimination of a discharge is only marginally more cost effective than upgrading treatment. Finally, it is not clear how ADEQ would determine relative cost effectiveness. How would ADEQ define "substantially more cost effective?"

37. Comment: The rule should make clear that standards can be modified only to the extent justified by the discharger's showing. For example, if a discharger shows that it is planning to stop discharging solely because of the high cost of meeting nutrient standards, any relaxation should be limited to nutrient standards, and should weaken such standards only to the minimum extent necessary to prevent removal of the effluent.

    Response: ADEQ believes that the net ecological benefit rule already states that a water quality standard can be modified only to the extent justified by a discharger's showing. The rule allows the modification of a water quality standard on the grounds of net ecological benefit only if a point source discharger makes 6 required demonstrations for each pollutant for which a modification is sought. R18-11-106(A) refers to a "water quality standard" as a singular noun. Thus, the required demonstrations must be made for each water quality standard for which a modification is sought.

    The establishment of a modified water quality standard is discretionary. Thus, it is already within the Director's discretion to establish a modified standard only to the minimum extent necessary to prevent elimination of a discharge. The rule already requires that all practicable point source discharge control programs be implemented before a water quality criterion may be modified. The water quality that can be achieved through such discharge control programs will inform the Director's discretion is establishing a modified water quality standard. R18-11-106(B) places a lower limit on the modification of a water quality standard under the rule. Under no circumstances may the Director establish a modified water quality standard that is less stringent than a technology-based effluent guideline that has been established by EPA for the pollutant.

R18-11-107. Antidegradation

38. Comment: The language of the antidegradation Section at R18-11-107 is confusing. Undefined terms make the provision vague to the point of unusability. Such terms include "highest statutory and regulatory requirements...set forth in the Clean Water Act," "necessary to accomodate...," and "important economic and social development."

    Response: The state antidegradation rule is modeled on the federal antidegradation policy at 40 CFR 131.12. The phrases cited in the comment are taken directly from the federal antidegradation regulation. Existing EPA guidance explains and interprets each of the subsections of the antidegradation rule, including the provisions cited by the commenter [See Water Quality Standards Handbook,

    Chapter 4, Antidegradation; Questions and Answers on Antidegradation [U.S. Environmental Protection Agency, August 1985]. In addition, ADEQ is developing a state antidegradation implementation guidance document which will help to further interpret the meaning of the rule.

39. Comment: The proposed rule would eliminate R18-11-107(A) which provides that the determination of whether a water is degraded will be on a pollutant-by-pollutant basis. This subsection should be retained. EPA policy prefers that the antidegradation rule be applied on a pollutant by pollutant basis [See Water Quality Standards Handbook, §4.5]. The current language was added to the water quality standards during the last triennial review for the good reasons stated in the concise explanatory statement for those rules.

    ADEQ explains the proposed change by claiming that the current rule would preclude the use of biocriteria and biomonitoring as a basis for determining whether a water is degraded. Even if that were true, which we question, that reason opens the

way for arbitrary decisions when implementing the rule. There are no biocriteria in the rules, nor is there a rule regarding the use of biomonitoring to determine whether a water is degraded. The city of Phoenix is not aware of any applicable EPA guidance to make such assessments under the antidegradation rule, particularly where the water quality standards contain numerous types of different designated uses. State law does not authorize rules that are incapable of reasonable interpretation without resort to guidance documents that do not have the force and effect of rules.

Removing the requirement to use a pollutant-by-pollutant analysis will cause unnecessary confusion, especially when analysis is based on parameters for which there are no numeric standards. By its very nature, the antidegradation rule requires a pollutant-by-pollutant analysis in order to determine whether in-stream water quality can maintain existing uses. Without the analysis provided by a pollutant-by-pollutant analysis, the antidegradation rule becomes too vague to be enforceable.

Response: ADEQ agrees that R18-11-107(A) should be retained. In the last triennial review of water quality standards, ADEQ adopted R18-11-107(A) to clarify that implementation of the antidegradation rule is on a pollutant-by-pollutant basis. As noted by the commenter, this subsection is consistent with EPA antidegradation guidance that "it is best to apply antidegradation on a parameter-by-parameter basis" [See Water Quality Standards Handbook, 2nd Edition, p. 4-7].

ADEQ is concerned that the language of R18-11-107(A) implies that an antidegradation review may be done only on a chemical-specific basis by reference to numeric water quality criteria. ADEQ would like to clarify that the antidegradation rule is expressed in terms of applicable water quality standards. While this includes numeric water quality standards for specific chemicals, it also includes the narrative toxics standard which requires that a surface water be free from pollutants in amounts or combinations of pollutants that are toxic to humans, plants, animals or other organisms. A finding of degradation may be made based upon an increase in the ambient toxicity in a surface water as measured by toxicity testing.

ADEQ agrees that there are no biocriteria in the water quality standards rules now. However, the state is developing a biocriteria program. Biocriteria may be included in the water quality standards rules in a future triennial review. When biocriteria are adopted as water quality standards, they may be used in determining whether degradation is occurring in a surface water.

40. Comment: Deleting the present R18-11-107(A) is a problem. Based on the explanation for the change, it appears that antidegradation, a rather subjective decision even in its present form, will now apply to situations which are not adequately defined by the water quality standards. The absence of objective numeric standards for biocriteria or biomonitoring results means that the subjective nature of an antidegradation violation will become even more subjective than is presently the case. It is unfair to require a discharger to comply with a "standard" which is nebulous at best. R18-11-107(A) should not be deleted.

    Response: ADEQ agrees that R18-11-107(A) should not be deleted. However, in retaining the reference to pollutant-by-pollutant analysis, ADEQ wishes to clarify that such analysis may include measurements of ambient toxicity as determined from toxicity test results. ADEQ does not agree that toxicity test results are subjective criteria which cannot be used in an antidegradation review.

    The antidegradation rule is expressed in terms of applicable water quality standards, including the narrative toxics standard. Thus, if it was determined from toxicity tests that there were toxic pollutants in toxic amounts in a surface water, then the narrative toxics water quality standard would be violated and the surface water would be considered Tier 1 for purposes of the antidegradation rule. As such, the existing water quality must be maintained and could not be further degraded. There could be no increase in ambient toxicity in the surface water. Similarly, if a surface water is free from toxics in toxic amounts as measured by toxicity tests, then it would be considered Tier 2 for purposes of the antidegradation rule. There could be no increase in toxicity in the surface water without meeting the requirements prescribed in R18-11-107(C).

41. Comment: EPA has commented previously regarding the apparent lack of implementation procedures for the state's antidegradation provision. This situation appears to be aggravated by the deletion of language which requires that the determination of degradation be made on a pollutant-by-pollutant basis. We encourage the state to restore this language to R18-11-107 and include it within the state implementation policy.

    Response: ADEQ retained R18-11-107(A) in the adopted rule as recommended by EPA and others. ADEQ also is developing procedures for implementation of the state antidegradation rule. However, the state's antidegradation implementation procedures need not be prescribed in the water quality standards rules. EPA guidance clearly allows the development of implementation procedures outside of the rule provided the state antidegradation policy is referenced in the water quality standards so that the functional relationship between the water quality standards and the antidegradation policy is clear [See Water Quality Standards Handbook, §4.3, p. 4-2].

    Arizona's antidegradation policy is stated in the water quality standards rule at R18-11-107. The rule is consistent with all of the requirements of the federal antidegradation policy set out in 40 CFR 131.12. Also, references in the Tier 1 and 2 antidegradation provisions to "the applicable water quality standard" make clear that there is functional relationship between the water quality standards and the antidegradation policy. ADEQ will establish procedures for implementation of the antidegradation rule in a guidance document through the state's water quality management process [i.e., the Continuing Planning Process].

42. Comment: The antidegradation rule, R18-11-107, should specify that all designated uses are protected. This provision, as written, only applies to existing uses.

    Response: The currently effective federal antidegradation policy at 40 CFR 131.12 makes no specific reference to the protection of designated uses. The state rule is consistent with 40 CFR 131.12. The state antidegradation rule at R18-11-107 is expressed in terms of applicable water quality standards. Under Tier 1 of the antidegradation policy, existing water quality

cannot be degraded in a surface water which does not meet the applicable water quality standard. Under Tier 2 of the policy, where existing water quality is better than an applicable water quality standard, the existing water quality must be maintained and protected. As EPA is well aware, a "water quality standard" consists of a designated use and the water quality criteria to protect that use. The state antidegradation rule therefore protects designated uses through the specific references to water quality standards.

43. Comment: Phelps Dodge has several concerns regarding ADEQ's draft antidegradation implementation guidelines. Phelps Dodge believes that the preparation and adoption of the guidelines should be subject to formal rulemaking requirements since they qualify as a rule under the Arizona Administrative Procedures Act [AAPA]. Under the AAPA, a rule is defined as "an agency statement of general applicability that implements, interprets, or prescribes law or policy, or describes the procedure or practice requirements of an agency. The draft implementation guidelines clearly qualify as a rule because they interpret the scope and application of Arizona's antidegradation policy.

    Response: ADEQ disagrees. While the draft antidegradation implementation guidance may be considered a "rule" under the Arizona Administrative Procedures Act as argued by the commenter, the guidance also may be properly considered to be a "substantive policy statement" under the Arizona Administrative Procedures Act. Under A.R.S. § 41-1001(21) a substantive policy statement" means:

    [A] written expression which informs the general public of an agency's current approach to, or opinion of... the requirements of...[an] administrative rule...including where appropriate, the agency's current practice, procedure or method of action based upon that approach or opinion. A substantive policy statement is advisory only.

    ADEQ's antidegradation implementation procedures describe the agency's current approach to and interpretation of the requirements of R18-11-107. The antidegradation implementation guidance document will describe ADEQ's current practice, procedure or method of action to implement the rule based upon ADEQ's interpretation of R18-11-107.

    Finally, the antidegradation implementation guidance is advisory only. No antidegradation implementation policy can apply generally to all facilities and activities. Required steps in an antidegradation review process may vary on a case-by-case basis depending on the facility or the activity that is subject to review.

44. Comment: ASARCO is concerned that the Department will examine overall conditions that are not tied directly to objective criteria in antidegradation reviews, thereby making the determination of compliance with the rule subjective and inconsistent.

    Response: Antidegradation reviews are tied to objective criteria under the adopted rule. An antidegradation review requires an analysis and characterization of existing water quality. Existing water quality is evaluated by reference to the water quality standards. For example, under Tier 1 of the antidegradation rule, no degradation of water quality is permitted in a surface water "where existing water quality does not meet the applicable water quality standard." The numeric and narrative water quality standards provide the objective criteria for determination of whether there is degradation or not. Similarly, Tier 2 of the antidegradation rule states that where existing water quality is better than the applicable water quality standard, the existing water quality shall be maintained and protected. In both cases, degradation is measured by reference to a water quality standard. ASARCO's concern that antidegradation reviews are not tied to objective criteria is unfounded. ADEQ's implementation guidance for the antidegradation rule will clarify further how water quality standards are used in antidegradation reviews.

45. Comment: It would be unwise to eliminate language from the current rule stating that "determination of whether there is any degradation of water quality...shall be on a pollutant-by-pollutant basis." Such deletion might lead some to incorrectly conclude that degradation with respect to any 1 pollutant is no longer sufficient to show a violation of the antidegradation rule. ADEQ expresses concern that the current language implies that antidegradation review is done only on a chemical-specific basis. The better way to address that concern is to expand the language of the rule, not narrow it. This could accomplished by changing the rule to read: "determination of whether there is any deradation of water quality...shall be on a pollutant-by-pollutant basis and by biological monitoring and criteria."

    Response: ADEQ agrees that R18-11-107(A) should not be deleted. However, ADEQ does not believe that it is necessary to expand the subsection by adding language which specifically addresses biomonitoring. ADEQ has stated in the concise explanatory statements for this and the previous triennial review that the "pollutant-by-pollutant analysis" may include an evaluation of ambient toxicity in a surface water to determine whether existing water quality complies with the narrative toxics water quality standard.

46. Comment: The proposal also is deficient in that it lacks antidegradation implementation procedures. EPA has identified this as a deficiency in Arizona's standards since 1986. The U.S. Fish & Wildlife Service in 1994 found that this deficiency needed to be corrected by 1995 to avoid incidental take of threatened and endangered species. Further under the Arizona Administrative Procedure Act and the Clean Water Act, such implementing procedures must be adopted as rules, not informal guidelines.

    Response: ADEQ agrees that antidegradation implementation guidance needs to be developed to explain the state's current approach to the state antidegradation rule. The guidance will identify the procedures the state will follow in evaluating activities that may impact existing water quality in Arizona surface waters. The state is just beginning to focus on the development of appropriate antidegradation implementation procedures through the state's water quality management process. Draft implementation procedures have been developed and circulated for public comment. ADEQ believes that these antidegradation implementation procedures should be initially developed as guidance through the Continuing Planning Process. Once the guidance is final and the state gains experience with antidegradation implementation procedures, the guidance document can

be reviewed to determine if any of the implementation procedures need to be incorporated into rule.

R18-11-108. Narrative Water Quality Standards

47. Comment: In 1993, EPA disapproved the lack of implementation procedures for the narrative toxics standard at R18-11-108(A)(5). After being sued by Defenders of Wildlife, EPA proposed their own standard at 61 FR 2766 (January 29, 1996) which proposes to use their own document, "EPA, Region 9, Policy on Using Biomonitoring to Implement Arizona's Narrative Toxicity Criterion." I don't find anywhere in your proposed rules or in the preamble to the proposed rules, the state's explanation of your response to the EPA disapproval or the state's proposal to bring the present Arizona rule into compliance. My understanding is that the state is working on implementation procedures so as to beat the deadline given in the Defenders of Wildlife lawsuit. What is the public to make of all of this? One has to be a legal detective to even figure out the procedure and there is no way to know the actual standards without resort to further sources within ADEQ that aren't mentioned in the Notice of Proposed Rulemaking. I object on a procedural basis that ADEQ has given insufficient notice to the public. Having said all that, I would like to suggest that you follow the EPA policy.

Response: On September 9, 1993, EPA disapproved the state's lack of biomonitoring implementation procedures for the narrative toxics standard. To be in compliance with §303(c)(2)(B) of the Clean Water Act and 40 CFR 131.11(a)(2), EPA said that the state must adopt chronic toxicity implementation procedures, including testing procedures. EPA said that the state must provide information identifying the methods for regulating point source discharges based on the state's narrative toxics standard. EPA also stated that Arizona was required to adopt a numeric toxicity standard or an implementation procedure for the narrative toxics standard which EPA could use in developing NPDES permits. EPA stated that if the state chose not to adopt a numeric criterion for ambient toxicity, such as 1 TU_a or 1 TU_c, then Arizona must, in its implementation procedures, specify how the narrative standard would be translated into numeric discharge limits for whole effluent toxicity in NPDES permits. EPA further stated in its disapproval letter that Arizona could include the necessary implementation procedures in a guidance or policy document.

To ADEQ's knowledge, the EPA disapproval of a narrative water quality standard for the absence of implementation procedures is unprecedented. Despite continuing questions over EPA's legal authority to disapprove Arizona's water quality standards on this ground, ADEQ agreed to develop an guidance document which described procedures for implementing the narrative toxics standard to address the EPA disapproval. However, ADEQ chose to develop this implementation guidance document through the state water quality management process [i.e., also called the Continuing Planning Process or CPP] because 1 of the required elements of the state CPP is a description of the process for assuring adequate implementation of new or revised water quality standards [See 40 CFR 130.5(b)(6)]. Thus, the development of the implementation procedures has taken place outside of the rulemaking process.

The Defenders of Wildlife lawsuit and the threat of a federal promulgation of implementation procedures for the state narrative toxics standard accelerated the state's development of the implementation guidance. ADEQ published notice and held public meetings on January 16 and 18, 1996, to take public comments on the draft implementation procedures for the narrative toxics standard. The draft implementation procedures closely followed the EPA Region IX *"Policy on Using Biomonitoring to Implement Arizona's Narrative Toxicity Criterion."* As a result of public comments received, ADEQ simplified the implementation guidance by removing language that specifically related to NPDES permitting issues. The revised implementation guidance specifies numeric benchmark toxicity criteria for determining whether there is a violation of the narrative toxics standard [i.e., 0.3 TU_a and 1.0 TU_c]. These numeric benchmarks may be used by EPA in developing whole effluent toxicity [WET] discharge limitations in NPDES permits. The state implementation guidance does not specifically address how WET discharge limitations are to be established in NPDES permits. Since Arizona does not have primacy over the NPDES permit program, ADEQ does not believe it can develop implementation guidance which legally binds EPA [the NPDES permit-issuing authority for Arizona] with respect to how WET discharge limitations are established in an NPDES permit. Existing federal guidance documents adequately address how EPA permit writers establish WET discharge limitations in NPDES permits.

EPA has indicated that the revised guidelines for implementation of the narrative toxics standard are approvable and will allow EPA to withdraw its disapproval.

48. Comment: Same comments with regard to the EPA disapproval of the lack of implementation procedures for the narrative nutrients standard at R18-11-108(A)(6).

Response: On September 9, 1993, EPA disapproved the lack of implementation procedures for Arizona's narrative nutrient standard at R18-11-108(A)(6). EPA stated in its disapproval letter that in order for the narrative nutrient standard to be approvable, the state must clarify how the narrative standard will be implemented or adopt numeric nutrient standards for Arizona surface waters. EPA stated that because Arizona lacked implementation procedures, there was insufficient support for the position that the narrative standard provides protection substantially equivalent to that provided by numeric nutrient standards promulgated by EPA for Arizona in 1976.

ADEQ responded to the EPA disapproval by letter dated July 6, 1994. ADEQ gave assurances to EPA that the state would clarify how the narrative nutrient standard would be implemented through the development of a guidance document. Again, ADEQ took the position that such implementation procedures should not be prescribed in rule. ADEQ developed a draft guidance document and initiated a public review process through the state water quality management process. During 1995, public comments were solicited at meetings held by local Councils of Government. The guidance document for the narrative nutrient standard was finalized and submitted to EPA on January 16, 1996. EPA has indicated that implementation guidance document is approvable and will allow EPA to withdraw its disapproval of the lack of implementation procedures for the nar-

rative nutrient standard.

49. Comment: The state's proposed implementation guidelines for the narrative nutrient standard are not adequate to address the problem of eutrophication in Arizona rivers and lakes. Those guidelines set out an elaborate set of investigation procedures, but offer no assurance that such investigations will ever be conducted anywhere. Indeed, the state's failure to develop numeric nutrient limits for many waters has been due to ADEQ's unwillingness to dedicate any resources to this task. ADEQ does not explain how the situation will be any different with respect to investigating violations of the narrative standard.

    Further, we question the need for a multi-level investigation procedure. To the extent that the Nutrient Enrichment Rating Sheet is an acccurate measure of narrative violations, a rating can be performed without going through multiple layers of investigation. We do, however, have serious concerns about the rating sheet. A number of the items require extremely subjective assessments. A major reason for requiring implementation procedures is to provide objective criteria for implementing the very subjective narrative standard. The rating sheet does not meet this need. Further, ADEQ does not indicate the source of, or technical basis for, the various rating criteria and scores. Also, the last sentence of the rating sheet states that if more than 6 of the criteria are rated at the highest score possible and/or the total score is greater than 75, then a narrative violation "is likely to have occurred." This equivocal language undermines the whole purpose of the implementing procedure. The quoted phrase should be changed to: "is deemed to have occurred."

    Finally, under the Arizona Administrative Procedures Act and A.R.S. § 49-221(A), these implementation guidelines must be adopted as rules, not merely as guidelines.

    Response: At the outset, it should be noted that the implementation guidelines for the narrative nutrient standard were developed through the state water quality management process with public participation procedures that are separate from the triennial review process to modify water quality standards. During 1995, public meetings were held by ADEQ and local Councils of Government to solicit comment on the implementation guidelines for the narrative nutrient standard. Theimplementation guidelines are not a subject of this rulemaking. The proper forum forcommenting on the content of the implementation guidelines was through those separate public participation procedures.

    Notwithstanding procedural objections about the proper forum for commenting on the guidelines, ADEQ disagrees that the state implementation guidance for the narrative nutrient standard is inadequate to address the problem of eutrophication of Arizona surface waters. The investigation procedures outlined in the guidance describe a technically defensible approach to the identification of eutrophication problems in Arizona surface waters and suggests the steps that will be followed to resolve a confirmed nutrients violation.

    Implementation and consistent enforcement of violations of the narrative nutrient standard is preferable to the establishment of numeric water quality criteria for nutrients for Arizona surface waters for the following reasons. First, there are no national criteria guidance recommendations which could be used a basis for numeric criteria for nutrients to control accelerated or cultural eutrophication in surface waters. There are no criteria guidance recommendations for total nitrogen to control eutrophication. While there is some discussion of data which might be used to support a total phosphorus criterion to control nuisance plant growth or accelerated eutrophication, a numeric criterion is not recommended by EPA. For example, EPA states in the Quality Criteria for Water, 1986 [Gold Book]:

    To prevent the development of biological nuisances and to control accelerated or cultural eutrophication, total phosphates as phosphorus (P) should not exceed 50 µg/L in any stream at the point wherer it enters any lake or reservoir, nor 25 µg/L within the lake or reservoir. A desired goal for the prevention of plant nuisances in streams or other flowing waters not discharging directly to lakes or impoundments is 100 µg/L total P.

    However, EPA acknowledges in the Gold Book that there are natural conditions that dictate the consideration of either a more or less stringent phosphorus level. EPA also notes in the Gold Book that eutrophication problems may occur in surface waters where the phosphorus concentration is less that that indicated above. Similarly, there are surface waters where phosphorus is not a limiting nutrient and the need for phosphorus standards is substantially diminished. In other words, EPA acknowledges that water quality standards for nutrients must be established on a site-specific basis.

    For example, EPA recognizes a number of specific exceptions can occur which reduce the threat of phosphorus as a contributor to eutrophication in lakes: 1) Naturally occurring phenomena may limit the development of nuisance growth of plants; 2) Technological or cost-effective limitations may help control introduced pollutants; 3) Waters may be highly laden with natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis; 4) Some waters morphometric features of steep banks, great depth and substantial flows contribute to a history of no nuisance plant problems; 5) In some waters, a nutrient other than phophorus is limiting to plant growth and the level and nature of such a limiting nutrient would not be expected to increase to an extent that would influence eutrophication; and 6) In some surface waters, phosphorus control cannot be sufficiently effective under present technology to make phosphorus the limiting nutrient.

    In the Gold Book, EPA suggests another method of controlling the inflow of nutrients into a lake or reservoir to prevent eutrophication. That is to prescribe an annual loading of total phosphorus for a receiving surface water. EPA suggests critical loading levels for total phosphorus in grams per square meter of surface area per year for a particular water volume and hydraulic detention time in years. However, EPA notes again that there may be surface waters where loadings that are higher than the recommended loadings of total phosphorus do not produce eutrophy, as well as surface waters where lower loadings may be associated with nuisance plant growth. In other words, the loading approach also must be determined on a site-specific basis.

    In the absence of national criteria guidance for nutrients or scientifically defensible loading limits to control cultural eutroph-

ication; and recognizing that many site-specific variables exist which affect whether eutrophication becomes a problem in a surface water, ADEQ has not developed numeric water quality criteria for nutrients that generally apply to surface waters in Arizona. Instead, Arizona has adopted numeric nutrient criteria for 10 surface waters based upon site-specific studies. In addition, EPA has promulgated federal nutrient standards for a limited number of surface waters in Arizona. ADEQ will continue to rely on these numeric criteria and the implementation of the narrative nutrient standard to identify surface waters with eutrophication problems.

R18-11-109. Numeric Water Quality Standards

50. Comment: The city of Mesa supports the repeal of turbidity criteria for the full body contact and partial body contact designated uses as not being scientifically defensible.

    Response: ADEQ agrees that the currently effective turbidity criteria for the full body contact designated uses and the partial body contact designated uses are not scientifically defensible. The turbidity criteria in the currently effective water quality standards rules were established to protect aquatic life, not recreational uses.

51. Comment: The city of Tucson believes that the change in the turbidity standard is a positive step toward resolving potential water quality issues for stormwater discharges.

    Response: With the repeal of the turbidity criteria for the full body contact and partial body contact designated uses, the currently effective turbidity criteria will not apply to ephemeral waters. Consequently, turbidity criteria will not have to be met by stormwater discharges to ephemeral waters.

    The currently effective water quality criteria for turbidity have no application to ephemeral waters for 2 main reasons. First, the currently effective turbidity criteria were established to protect aquatic life which does not occur in ephemeral waters. Second, the current turbidity criteria were established without any consideration of the natural turbidities that are associated with stormwater runoff in ephemeral waters. Suspended solids in stormwater runoff are a natural component of ephemeral waters and may be abundant during periods of high precipitation and runoff.

    Anthropogenic activities may increase the load of suspended solids in an ephemeral water above the level which would be normally expected in an unimpacted ephemeral water. However, research needs to be done on ambient turbidities and total suspended solids levels in ephemeral waters in Arizona to support the establishment of scientifically defensible water quality criteria for turbidity.

52. Comment: ASARCO strongly supports the proposed repeal of turbidity criteria for the full body contact and partial body contact designated uses because they are not scientifically defensible. Also, the turbidity criteria should be repealed because of the unique problems associated with applying turbidity standards to stormwater discharges in arid climates.

    Response: ADEQ agrees for the reasons set out in the response to the previous comment.

53. Comment: The Pima County Department of Environmental Quality concurs with ADEQ's proposed repeal of turbidity criteria for the full body contact and partial body contact designated uses. This will provide much needed and appropriate relief for jurisdictions in Arizona who are issued NPDES permits and must meet Arizona water quality standards.

    Response: ADEQ agrees. However, ADEQ would like to clarify that the state is not repealing all of the numeric water quality criteria for turbidity. ADEQ is retaining turbidity criteria for the protection of aquatic life in surface waters that are cold water fisheries, warm water fisheries, and in effluent dependent waters. NPDES-permitted facilities, including stormwater discharges, which discharge to surface waters with the A&Wc, A&Ww, and A&Wedw designated uses are required to comply with applicable water quality standards, including turbidity. The proposed repeal will provide some relief for an NPDES-permitted stormwater discharge if it is to an ephemeral water. In such cases, the numeric water quality criteria for turbidity will not apply.

54. Comment: The proposal to eliminate numeric turbidity standards for FBC and PBC waters is ill-advised and contrary to federal law. The state must adopt standards adequate to protect designated uses. Turbidity limits are necessary to protect the safety and aesthetic enjoyment of swimming and other water recreation. The fact that the state's current turbidity limits are based on the protection of warm water aquatic life hardly justifies leaving FBC and PBC without any numeric turbidity limits at all. It would make far more sense to use the turbidity limits for cold water aquatic life as turbidity limits for FBC and PBC waters. Waters meeting cold water fishery standards typically have the level of clarity that people expect and find desirable for swimming and other water recreation, and would also assure sufficient visibility to avoid safety hazards. An even more justifiable standard for FBC waters would be to prohibit any turbidity. That is the approach taken in Arizona's regulations for outdoor swimming pools, which deal with the same type of use.

    Response: While the commenter is correct that states must adopt water quality criteria that protect designated uses, such criteria also must be based upon a sound scientific rationale. The currently effective turbidity criteria for the full body contact and partial body contact designated uses are not supported by a sound scientific rationale. There is no correlation between the currently effective numeric water quality criteria for turbidity and what may be necessary to protect a surface water for primary or secondary contact recreation or aesthetic enjoyment.

    ADEQ agrees that the adoption of turbidity criteria for surface waters that are cold water fisheries or for outdoor swimming pools would provide a level of water clarity in a surface water that is adequate for primary and secondary recreation. However, the complete prohibition on turbidity in a natural surface water is physically impossible. ADEQ also believes that the establishment of A&Wc criteria is unnecessarily stringent and unattainable in Arizona surface waters. While it may be argued

on paper that the water in a surface water with either the FBC or PBC designated use should be as clear as the water in a swimming pool, ADEQ believes that such a water quality goal is simply unattainable in the real world. The only way to achieve such clarity would be to filter and disinfect the surface waters of Arizona.

It should be noted that the repeal of the turbidity criteria for full body contact and partial body contact affects ephemeral waters only. All other surface waters in Arizona [with the exception of canals which are not protected for the FBC or PBC designated uses] have an A&Wc, A&Ww or A&Wedw designated use. Consequently, the turbidity criteria for the A&Wc, A&Ww and A&Wedw designated uses will be retained and will remain the same for most of the surface waters in Arizona.

55. Comment: The proposed standard for dissolved oxygen in effluent dependent waters is grossly inadequate to protect aquatic life. It fails to comply with the Clean Water Act and EPA water quality standards rules, which require that standards be adequate to protect uses, including the protection and propagation of fish and wildlife. It is not enough for standards to prevent acute mortality [and the proposed standard is not even stringent enough to assure that]. EPA's national water quality criteria for dissolved oxygen require a 1-day minimum of 5 mg/L for the protection of early life stages of warm water aquatic life. The state's proposed daytime minimum of 3 mg/L and nighttime minimum of 1 mg/L for effluent dependent waters are far less protective than the national criteria, and therefore cannot be approved by EPA. The state's proposal is further deficient because it contains no DO standards for 30-day mean, 7-day mean, or 7-day mean minimum as specified in EPA's national criteria.

Response: Effluent-dependent waters (EDWs) are created aquatic habitats that exist primarily because of the discharge of wastewater. In most cases, the removal of that discharge would result in not only the loss of the aquatic habitat but the loss of the associated riparian habitat. The benefits of these created habitats can be easily seen by looking at the wildlife that are attracted to and depend on these waters.

The state has recognized EDWs as a class of waters distinctly different from coldwater, warmwater or ephemeral habitats. EPA's national criteria for dissolved oxygen are based only on coldwater and warmwater habitats; not created EDWs. While the state was able to develop EDW water quality criteria for the priority pollutants on the basis of a methodology that considered only resident EDW aquatic species, few data are available for the development of dissolved oxygen criteria for EDW species. Not only are data lacking specific to EDWs but EPA's Ambient Water Quality for Dissolved Oxygen (1986) discusses a number of issues relevant to the applicability of their laboratory-derived data to natural conditions. Given these data gaps, the state has little basis for justifying the application of the national warmwater dissolved oxygen standard to EDWs.

Recent work done on developing site-specific dissolved oxygen criteria for the South Platte River in Colorado [an effluent dependent water] suggests that the proposed dissolved oxygen criteria are protective of Arizona's EDW aquatic species. Nineteen species of fish have been documented to inhabit EDWs in Arizona. Ten of these are also found in the South Platte River. Four other species are represented by a member of the same genus. When the South Platte study was initiated, of the species known to inhabit the river, the 3 species that were considered most likely to be the most sensitive to low dissolved oxygen were fathead minnow, channel catfish, and largemouth bass. All of these species are found in Arizona EDWs. Of these 3 species, No-Observed-Effects Concentration (NOEC) data were generated on Older Life Stages (OLS) for fathead minnow and largemouth bass; and Earlier Life Stages (ELS) for fathead minnow (see table below).

Laboratory Test	Fathead Minnow	Largemouth Bass
OLS NOEC - 1 Day minimum NOEC survival (mg/L)	< 0.9	< 0.8
OLS NOEC - 7 Day mean minimum NOEC DO survival (mg/L)	< 1.1	< 0.9
ELS - 1 Day minimum NOEC larval survival (mg/L)	2.0	No data available
ELS - 1 Day minimum NOEC hatching success (mg/L)	< 1.0	No data available
ELS - 30 Day mean NOEC larval growth (mg/L)	5.1	No data available

The results of the South Platte River study suggest that, for largemouth bass and the fathead minnow, the state's 1.0/3.0 mg/L diurnal standard is relatively protective for the 1-day and 7-day minimums.

Also, dissolved oxygen data from Arizona EDWs show that dissolved oxygen concentrations range from > 1 mg/L to > 12 mg/L on a daily basis and that occasionally super-saturation occurs. Consequently, it is likely that daily means are at or greater than the 30-Day mean NOEC larval growth value of 5.1 mg/L that was found for fathead minnow in the South Platte River.

While there are not enough data to develop a more scientifically-based EDW dissolved oxygen standard in Arizona, enough information exists to suggest that the criteria are adequately protective. To determine whether or not that assumption is correct, it will be necessary to have regional or site-specific studies to determine what is the most sensitive species inhabiting Arizona EDWs. For example, the information cited from the South Platte River study pertained only to fathead minnow and largemouth bass. That study found that the Johnny darter (not resident in Arizona EDWs) was the most sensitive fish species inhabiting the South Platte River EDW. Consequently, the site-specific water quality criteria for the South Platte River were based on protecting the Johnny Darter.

In the absence of available guidance to justify dissolved oxygen criteria for an effluent dependent water, the State adopted a 1.0 mg/L as an absolute minimum. During the current triennial review, the State has proposed making the absolute minimum standard more stringent during daytime hours (daytime = 3.0 mg/L; nighttime = 1.0 mg/L).

The commenter criticizes the dissolved oxygen criteria as being deficient because it contains no criteria for 30-day mean, 7-day mean, or a 7-day mean minimum as specified in EPA's national criteria guidance document. Gold Book criteria are recommendations for states, not rules. Moreover, EPA's "Ambient Water Quality Criteria for Dissolved Oxygen" recognizes that its criteria are based almost entirely on laboratory data rather than field studies and this could result in a more protective standard than necessary. Considering this fact, the national criteria guidance document states:

> "..if the laboratory data are applied as minimum allowable criteria, the criteria will presumably be higher than necessary because the mean dissolved oxygen concentration will often be significantly higher than the criteria. If applied as a mean, the criteria could allow complete anoxia and total mortality during brief periods of very low dissolved oxygen or could allow too many consecutive daily minima near the lethal threshold. If only a minimum or a mean can be given as a general criterion, the minimum must be chosen because averages are too independent of the extremes (emphasis added)."

The currently effective dissolved oxygen criteria to protect designated uses are expressed as minimums and these criteria have been approved by EPA.

56. Comment: ADEQ's §305(b) reports repeatedly show eutrophic conditions in rivers and lakes throughout the state. The 1994 report cites such conditions in Mormon Lake, Lower Lake Mary, Rainbow Lake, Black Canyon Lake, Alamo Lake and other waters. Yet there are no numeric limits on nutrient levels in these lakes. The state's failure over many years to develop such limits violates the Act's mandate that standards be developed to protect uses.

    Response: ADEQ disagrees that numeric water quality standards for nutrients for surface waters which show eutrophic conditions are mandated by the Clean Water Act and its implementing regulations. It is true that the Clean Water Act requires that states adopt water quality criteria that protect designated uses. However, such criteria must be based on a sound scientific rationale [See 40 CFR 131.11(a)]. In establishing water quality criteria, the Clean Water Act's implementing regulations provide that a state should: 1) establish numeric criteria based on §304(a) guidance, §304(a) guidance modified to reflect site-specific conditions, or other scientifically defensible methods; and 2) establish narrative criteria where numeric criteria cannot be established or to supplement the numeric criteria [See 40 CFR 131.11(b)].

    As noted in a response to a previous comment, there are no §304(a) guidance recommendations for nutrients to prevent accelerated cultural eutrophication of surface waters. Because of the many variables that may affect eutrophication, the only scientifically defensible way to establish numeric nutrient limits for a surface water is on a site-specific basis. Site-specific studies to establish numeric water quality criteria for nutrients are resource intensive. ADEQ admits that current resource constraints have prevented the agency from conducting such studies. While agency resource constraints have operated to limit the number of surface waters with numeric water quality criteria for nutrients, ADEQ also questions the utility of the establishment of numeric nutrient criteria for the reasons stated below. ADEQ has developed numeric water quality criteria for nutrients for a number of Arizona surface waters [See R18-11-109(H)]. These numeric water quality criteria are supplemented by a narrative nutrient criterion which applies to surface waters for which numeric criteria have not been established. This combination of numeric and narrative criteria for nutrients meets the requirements of the Clean Water Act.

    Arizona's waters are naturally low in nitrogen. Long, warm, sunny days, high water temperatures and ample natural sources of phosphorus combine to cause some of our aquatic ecosystems, in their natural condition, to be among the most productive ever measured. This condition coupled with the natural tendency for reservoirs and shallow lakes to become eutrophic allows natural inputs of nitrogen from atmospheric fixation, fixation by plants and algae and the breakdown of organic matter to have a large effect on trophic status.

    All the lakes cited by the commentor are reservoirs with the exception of Mormon Lake, which is a shallow wetland/lake ecosystem. When a stream or river is dammed to form a reservoir, water is not the only substance which is stopped from continuing along its natural course. Organic matter, in dissolved and particulate forms, also is retained and over time builds up to high levels. This organic matter is broken down and nitrogen is released and incorporated by the plant community. The sources of this organic matter are varied and may come from natural sources such as in situ production of plant material and plant materials washed into streams during runoff. Also anthropogenic sources such as direct input from the discharges of treated sewage and other effluents and indirect inputs from nonpoint sources such as the runoff from septic tanks and fertiliz-

ers and increased organic matter input from grazing may contribute.

None of the lakes cited by the commentor have direct inputs of treated effluent and only 1, Alamo Lake, has permitted discharges in its watershed which could be addressed by numeric nutrient standards. The probable cause of the eutrophication of all the cited lakes is a combination of the tendency of reservoirs and shallow lakes to become eutrophic and input of organic matter and nitrogen from natural and anthropogenic nonpoint sources.

The narrative nutrient standard now contained in the water quality standards rules may be used to address not only nitrogen inputs but also any other input which could cause an excess growth of aquatic plants and algae. A numeric nitrogen standard may not, in many cases, detect a numeric violation in the midst of an overproductive aquatic ecosystem due to the tight cycling of nutrients which has been demonstrated to occur in Arizona. This tight cycling means that most of the nutrients are contained in plant biomass where they are broken down and reused quickly leaving low levels in the water column. The narrative nutrient standard may be used to identify overproductive aquatic ecosystems no matter the cause. Once the problem is identified, and if it is not caused by a discharge, nonpoint source best management practices are the most effective way to address nutrient problems in Arizona surface waters.

57. Comment: The City of Phoenix supports the proposed dissolved oxygen standard for effluent dependent waters. The proposed standard takes into account the diurnal nature of dissolved oxygen in surface waters and the ability of fish species found in EDWs to survive short term exposure to low levels of dissolved oxygen. This standard is scientifically defensible and supportable.

    Response: ADEQ agrees. ADEQ adopted diurnal water quality standards for dissolved oxygen in effluent dependent waters as proposed.

R18-11-110. Salinity of the Colorado River

58. Comment: This Section has not been amended to reflect the standards implementation requirements adopted by the Colorado River Basin Salinity Forum for the 7 basin states in the 1993 review.

    Response: In the last triennial review of the state water quality standards, ADEQ repealed references to implementation requirements for the salinity standards for the Colorado River. The salinity standards rule, including the repeal of the implementation procedures, was approved by EPA. The state proposed no amendments to the salinity standards rule in this triennial review.

    The currently effective rule prescribes the water quality criteria for salinity at 3 control points on the Lower Colorado River. The basinwide implementation plans to ensure that the salinity criteria are met are found in the 1993 triennial review document prepared by the Colorado River Basin Salinity Control Forum [Forum]. Arizona supports the basinwide approach to implementation of the salinity standards as contained in the Forum's 1993 triennial review document. However, Arizona does not believe that such implementation plans should be incorporated into Arizona's water quality standards rules. Arizona has stated on several occasions [and EPA has agreed] that implementation procedures for water quality standards are properly located in guidance documents or in policy statements, but not in the water quality rules themselves. EPA Region IX obviously agreed with this position in the last triennial review when it approved the salinity standards for the Lower Colorado without elements of the implementation plans in rule. Also, this approach has been approved by other EPA regional offices. EPA Region VIII recently approved Colorado's water quality standards for salinity and the adoption of the basinwide plan of implementation as a separate policy statement. Arizona should not be required to amend its water quality standards rule to include salinity control implementation procedures contained in the Forum's most recent triennial review document.

R18-11-111. Analytical Methods

No comments

R18-11-112. Unique Waters

59. Comment: The Department received 141 written comments on the unique waters nominations, most addressing the Buehman Canyon Creek nomination. Several of the comment letters in support of the nominations had multiple signatures. A summary of the written record based on signatures shows:

Unique Water Nomination	Support	Non-Support
Buehman Canyon Creek	180	9
Aravaipa Creek	54	0
South Fork Cave and Cave Creeks	42	0

    Many of the comments in support of the nominations came from private citizens and small business owners primarily in Tucson and Oracle, and private landowners in the Cascabel and Redington areas. Organizations supporting 1 or more of the nominations included the following: Redington Natural Resource Conservation District, Sierra Club (Rincon & Palo Verde Groups, Legal Defense Fund), the Nature Conservancy, Arizona League of Conservation Voters, Arizona Riparian Council, Pima County Public Works Department of Transportation and Flood Control District, Arizona Game & Fish Department, Tucson Audubon Society, Oracle Trails Coalition, Southwest Center for Biological Diversity, Arizona Center for Law in the Public Interest, and Saguaro Forest Associates.

Comments in opposition to unique waters nominations were received only for Buehman Canyon Creek. These comments came primarily from small mineral exploration companies and the Southwestern Minerals Exploration Association.

In addition to the written record, 18 formal comments were made at the Tucson public hearing. Sixteen of these comments were in support of the unique waters nominations, primarily Buehman Canyon, and 2 comments were made in opposition to the Buehman Canyon nomination.

Buehman Canyon Creek Nomination

Representative comments are separated according to support or opposition to the unique waters nomination. Comments in support are separated according to the unique waters nomination criteria: 1) Exceptional recreational and ecological significance, and 2) presence of threatened and endangered species.

Exceptional Recreational Significance

60. Comment: It is enjoyed by hikers, bikers, photographers, birdwatchers, naturalists, hunters and silence. It's a beautifully scenic area...

61. Comment: This canyon is also a very popular place for recreational retreats by my family as well as many families in Cascabel and Redington. We enjoy the high quality water in the stream that allows our children to swim and frolic without fear of contamination. Places like this in Arizona are harder and harder to find.

62. Comment: As the president of a construction company, I realize my business success depends upon growth. I also realize growth also depends on the quality of life in Arizona...We need to recognize and protect our great natural resources, especially valuable surface waters.

63. Comment: Please listen to the people and respect their spirit. This part of the San Pedro Valley and adjoining areas like Buehman and Redfield Canyon are 'heaven on earth'! We guide groups from all over the world to these places. We guide for Redington Land and Cattle in Cascabel. Please do not let them desecrate our pristine Buehman Canyon.

64. Comment: The fact that the creek is close to Tucson means that it has exceptional recreational value for a large number of Arizonans.

65. Comment: Please consider the needs of the people of Tucson as well as the economy of Tucson which depends a great deal on tourists who come to Tucson to see the beautiful wilderness areas.

66. Comment: Consider the economic advantages of Buehman Canyon in its natural state. The greatest selling points for our state are recreation and life style...A number of groups have banded together to preserve the San Pedro, which is quickly becoming a highly desirable eco-tourist destination with important positive economic consequences for the area. To allow the degradation of Buehman Canyon Creek, an important tributary of the San Pedro, is to fly in the face of what so many have labored to accomplish.

67. Comment: Please grant the unique waters designation to Buehman Canyon Creek for the sake and wonder of our children and our children's children. We must...remember our children's future will be a direct reflection of our current choices.

Exceptional Ecological Significance

68. Comment: As the local citizens organization established under Arizona law to make recommendations concerning conservation of this kind, the Redington NRCD has concluded that Buehman Creek is precisely the kind of unique water the statute was enacted to protect...All of the riparian areas in this conservation district are of critical concern, and for years a great diversity of landowners, conservation groups, and government agencies have been actively trying to prevent any further loss or degradation of our unique waters. We have sometimes disagreed about how to do it, but there is very widespread agreement and a strong concern among local ranchers, other resident landowners, nonprofit conservation organizations, and federal land stewards that Buehman Creek is an irreplaceable Arizona treasure which should be preserved.

69. Comment: It is 1 of the few remaining perennial creeks in southern Arizona, and it supports a rich riparian community which is critical to the survival of a diverse group of plants and animals.

70. Comment: Think of the gigantic desert that lies on the eastern slope of the Catalinas and Buehman the only live stream...The architecture of its desert hillsides stuffed with saguaros. The stately cottonwood and sycamore anchored streamside. The turtles, frogs and fish, the kingfishers, redtails, the ducks and the deer. The wonderful combination of these contrasting components of stream and desert create a canyon so visually exciting that if it were another state it would be declared a national monument.

71. Comment: Buehman Canyon Creek descends through several different life zones and is a significant riparian area. The protection of riparian habitats is critically important in Arizona because, as the Arizona Game and Fish Department estimates, 75% or more of all Arizona's native wildlife species depend on healthy riparian ecosystems during some portion of their life cycle. Less than 0.5% of Arizona's landscape is riparian.

72. Comment: We cannot afford the loss of any more clean water in this arid region, nor can we afford the loss of any more riparian habitat. The loss of clean water in southern Arizona causes not only environmental upheaval but it is also economically burdensome. The continuing loss of this resource demands ever more radical and expensive means of replacing that water which is lost to our use.

73. Comment: We need to preserve Buehman Creek for all the life that finds it home and for us humans who need to return to the natural world when we can.

74. Comment: In 1989 the Pima County Flood Control District acquired land at Bingham Cienega, a spring-fed marsh near Redington. This 300 acre tract of land also includes an intermittent reach of the San Pedro River, where underflows are forced to the surface. Based on recent isotopic evidence, I believe the principal source of water to Bingham Cienega is from recent recharge rather than leakage of fossil water from a confined aquifer at greater depth. Buehman Canyon may provide an important source of high-quality water to the cienega, as well as the San Pedro River. Buehman Canyon was identified as a Class I riparian habitat in Pima County's Critical and Sensitive Wildlife Habitat Map. The District has also identified it as a riparian habitat qualifying for protection and mitigation requirements under our Floodplain and Erosion Hazard Mitigation Ordinance, adopted August 19, 1994. This ordinance applies only to development plans and subdivision plats.

75. Comment: I am a natural history cinematographer working on a film about the Sonoran Desert. This film is a 3 year project by Oxford Scientific Films, Ltd., of England and National Geographic Society Television of Washington D.C. It will air as a NGS-TV special on NBC later this year. During our travels throughout the Sonoran Desert, we've come to know Buehman Canyon Creek as 1 of the best places to film wildlife...During the past 2 years, the annual precipitation has been sporadic. It is at these times when drought condition exist that the value of Buehman Canyon Creek as a provider for life and shelter becomes so apparent.

76. Comment: As a cultural anthropologist much interested in processes of social development of the San Pedro River Valley in the vicinity of the Cascabel and Redington, I urge you to pursue this designation. The community emerging in this part of the San Pedro Valley understands the importance of this zone as a flyway for migratory birds and a corridor for wildlife movement between the sky islands in the area. This value in turn depends on the flow of water from the major tributaries in the immediate vicinity, Buehman Creek being 1 of these crucial tributaries.

Presence of Threatened & Endangered Species

77. Comment: A number of rare, threatened or endangered species have been documented in the area, including the peregrine falcon, longfin dace, Gila topminnow, desert pupfish, leopard frog, southwestern willow flycatcher, northern beardless tyrannulet, northern gray hawk, desert tortoise, zone-tailed hawk, Catalina beard tongue (*Penstemon discolor*), Pima Indian mallow, and San Carlos wild-buckwheat."

78. Comment: This creek is an unusual and unique surface water which provides a wildlife migration corridor between the upper elevations of the Santa Catalinas and the San Pedro River Valley. Through its travels through several life zones, it supports a diversity of plants and animals, including numerous species that are listed or are candidates for listing as threatened and endangered.

79. Comment: It is my hope that this unique and increasingly rare piece of heritage and wilderness can be protected for myself, you, my children, and yours. In am concerned that watersheds containing native threatened and endangered species are shrinking making extinction a certain possibility."

80. Comment: Additional features of Buehman Canyon that make it especially valuable are the presence of at least 1 native species of fish, the longfin dace, and 1 native ranid frog, the lowland leopard frog, in the *absence* of any introduced aquatic predators. It is clear from extensive recent work by many investigators that 1 of the primary causes, if *the* primary cause, of recent declines and local extinctions of native fishes and ranid frogs in Arizona is the pervasiveness of introduced predatory fishes..., bullfrogs, and crayfish in perennial waters in the state. The absence of these predators in Buehman Canyon is extremely important and makes that stream even more valuable.

    Response: ADEQ agrees with the comments in support of the Buehman Canyon Creek nomination. Buehman Canyon Creek meets the necessary criteria for classification as a unique water. The adopted rule therefore classifies Buehman Canyon Creek as a unique water.

81. Comment: The current status of stocked populations of Desert Pupfish, *Cyprinodon macularis*, and Gila Topminnow, *Poeciliopsis occidentalis*, in Buehman Canyon Creek is not clear to the Arizona Game & Fish Department. Longfin Dace are not listed as threatened or endangered species by either the State of Arizona or the U.S. Fish & Wildlife Service. A search of our Heritage Data Management System revealed the occurrence of the Lowland leopard frog, *Rana yavapaiensis*, in Buehman Canyon Creek. This frog is listed as a state candidate species in "Threatened Native Wildlife in Arizona." Buehman Canyon Creek has recreational and ecological significance, particularly associated with riparian and woodland habitats along the creek.

    Response: ADEQ agrees with the Arizona Game & Fish Department that Buehman Canyon Creek is of exceptional recreational and ecological significance. ADEQ agrees that the Longfin Dace is not listed as a threatened or endangered species. Finally, ADEQ agrees that the current status of the stocked populations of Desert Pupfish and the Gila Topminnow is unknown. However, the very fact that Buehman Canyon Creek was chosen as a site for the reintroduction of the Desert Pupfish and the Gila Topminnow is an indication of the exceptional ecological significance of this surface water.

Comments in Opposition to Buehman Canyon Creek unique waters nomination:

82. Comment: The adoption of a rule designating Buehman Canyon Creek as unique waters is procedurally flawed; would detrimentally effect a major segment of the regulated community - namely the further exploration, development and production operations contemplated by Keystone; and might constitute a regulatory takings or partial takings resulting in substantial (and

unnecessary costs) to the State of Arizona.

83. Comment: Although the ADEQ knew at the outset that a copper deposit of economic importance lies in and near Buehman Canyon, we never received notice from ADEQ that they were considering a unique waters designation and no attempt was made to contact us as owner of the mining claims in Buehman Canyon.

    Response: When the nomination was originally prepared in 1990 the Coronado National Forest was informed about plans to nominate Buehman Canyon Creek as a unique waters. Mr. McGinnis, owner of the Bellota Ranch, also was contacted about the possibility of including the portion of the creek on his private land with the proposal. At that time Mr. McGinnis was not interested in including his land with the nomination. The nomination was submitted to ADEQ in October, 1990. When received, it was too late in that triennial review of water quality standards to include the nomination in the proposed rule package. Consequently, ADEQ did not begin the public review of the proposal until the current triennial review.

    The adoption of water quality standards through the triennial review process is a very open, public process. During the current triennial review process, the following steps were taken to keep the public and regulated community informed about proposed rule changes, including the Buehman Canyon Creek unique waters nomination:

    1. January 1994 - The 1st round of public meetings for the triennial review process was held. The Buehman Canyon nomination was highlighted as a proposed unique water.
    2. February 1994 - By letter, all land management agencies were informed of proposals for unique waters that would be considered by ADEQ, so that comments of support or non-support could be submitted.
    3. July 1994 - At the annual ADEQ/USFS meeting the nomination of Buehman Canyon Creek, as well as other unique waters proposals, was presented to the Forest Service.
    4. November 1994 - The 2nd round of public meetings for the triennial review process was held. The Buehman Canyon Creek nomination was once again highlighted as a proposed unique water.
    5. February 1995 - ADEQ sent out a letter announcing a series of public meetings to be held around the state for the purpose of discussing the proposed unique waters.
    6. March 1995 - A public meeting was held at the Tucson Main Library, to answer questions and solicit written comments for or against the unique waters proposals.
    7. August 1995 - Public meetings were held to discuss ADEQ's draft rules package which included discussion of the proposed unique waters.
    8. September 30, 1995 - The comment period for the proposed rule changes ended. All Buehman Canyon comments received by this date were in support of the proposal. Included in the comments was a request by Mr. Bill McGinnis of the Bellota Ranch (adjacent to Forest Service land) to include with the existing unique water nomination the portion of Buehman Creek that flows through his private land.

84. Comment: Buehman Canyon Creek is not a unique site for wildlife migration, nor is it a perennial stream as stated. There are numerous intermittent streams and canyons in the area...All are intermittent streams with riparian vegetation.

    Response: A unique waters nomination does not require that the water body be perennial, but that the water body have unique attributes of recreational or ecological significance or the presence of threatened and endangered species. According to the document, "Arizona Rivers, Lifeblood of the Desert" (Arizona Rivers Coalition, March 1991), the Buehman Creek reach, headwaters to Forest Service Road #801 (ca. 2 miles below FS boundary), is characterized as follows: The entire length of the upper section is perennial and free-flowing; near the lower end, the creek goes underground and emerges intermittently in small perennial pools. The entire length is free-flowing during spring snowmelt and summer monsoons. "A Biotic Survey of Buehman, Espiritu, Youtcy and Roble Canyons in the Redington Pass Region, Arizona" (Jim Malusa and J. Mark Porter, Dept. of Ecology and Evolutionary Biology, University of Arizona) describes a stream with varying degrees of flow from perennial to ephemeral depending upon the specific stream reach. Work done by the University of Arizona, the Arizona-Sonora Desert Museum, and Saguaro National Park has shown that the Buehman Canyon area is indeed a corridor for wildlife migration and a valuable habitat for a number of rare, threatened or endangered species.

85. Comment: The soil on both sides of Buehman Canyon at and below the mine site contain toxic compounds of copper, arsenic, lead, zinc and other heavy metals which stunts vegetation growth. The alkalinity of the water of almost 8.0 will not dissolve these metals and will not show in water analyses. We see no "attributes of pristineness" or a healthy habitat for endangered species as has been stated as a requirement to attain the status of unique waters.

    Response: Water samples collected in May/June, 1991 at 3 sites near the Coronado National Forest boundary indicate good water quality with no exceedances of water quality standards, and no detections of arsenic, copper, lead or zinc. On November 29, 1995, samples were taken on the perennial reach located downstream of the Forest Service boundary. The results again indicated good water quality with mostly non-detects of total recoverable metals. Detectable metals were well below water quality standards limits. The dissolved portion of metals is the only portion that is biologically available to organisms, and the primary source of concern in protecting water quality. Also, high alkalinity is common in Arizona streams due to the geology. The criteria for designation of unique waters [A.A.C. R18-11-112(D)], do not state that the water quality of a proposed unique water must be pristine. This characteristic is only 1 of the criteria that can be cited as support for a nomination of a unique water.

86. Comment: We feel that the Sierra Club has used the unique waters proposal to oppose our mining plans in the area. The unique waters designation should not be adopted because the existing ADEQ permitting rules are adequate to protect the area of our planned mining activities.

    Response: The unique waters designation pertains to water quality and does not necessarily preclude mining activities. However, the discharge control requirements for a mining facility may be more stringent and may affect mining operations. Direct point source discharges to a unique water would be prohibited and indirect discharges (e.g., to tributaries of unique waters) may not degrade the water quality of the unique water. Consequently, a copper mine in the Buehman Canyon watershed would need to be operated in a manner that does not affect ambient water quality. Regardless of the activities planned in Buehman Canyon, the nomination met the criteria at R18-11-112(D).

87. Comment: The copper ore is far more unique than the creek in Buehman Canyon.

    Response: In order to qualify as a valid unique waters nomination, a surface water must meet at least 1 of the following criteria found at A.A.C. R18-11-112(D): (1) The water body 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 the wilderness characteristics, or (2) Threatened or endangered species are known to be associated with the water body and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species. Buehman Canyon meets both of these criteria. The relative scarcity or the "uniqueness" of copper ore deposits is irrelevant.

88. Comment: The statement that Buehman Canyon is "1 of the few, if not the only occurrence of limestone at a Sonoran desert stream" is patently false.

    Response: Further research shows that while the occurrence of limestone in Sonoran desert streams is not common, it is not as unusual as the nomination material suggests. Nevertheless, Buehman Canyon Creek still meets the necessary criteria for a unique waters nomination.

89. Comment: Public access to Buehman Canyon has been denied by local landowners. A unique waters designation for Buehman Creek would result in our inability to use our 10 inch cased water well which has been registered with the Department of Water Resources.

    Response: A unique water designation only applies to water quality and has no effect on private property rights or water rights. Access to the area via private land is at the discretion of the private land owner. The classification of Buehman Canyon Creek as a unique water would have no effect on the use of a well.

90. Comment: How the word unique ever got into the books as a qualification is beyond comprehension...Because no canyon or creek is exactly like another...the word usage in a specific case is a useless generality...Buehman Canyon Creek is no different than hundreds of other canyons or creeks coming from Arizona mountains...Judge this and other cases on more compelling reasons than the tool of special interest striving to lock away our public lands from the general public's use.

    Response: The term "unique water" is equivalent to the phrase "Outstanding National Resource Water (ONRW)". Under the Clean Water Act, all states are required to include a mechanism within their water quality standards rules to allow for specific water bodies to be designated as ONRWs (or "unique waters" as termed in Arizona's rules). The 2 criteria for this classification are found at R18-11-112(D). Buehman Canyon Creek meets both of these criteria.

91. Comment: We believe that the Sierra Club's proposal of a unique waters designation is only an attempt to deny the public future access to the area and future tax revenues and economic benefits from the area.

    Response: The designation of Buehman Creek as a unique water will have no effect on public access to the area. The designation only applies to the level of water quality protection required. Tax revenues and economic benefits may be measured in a multitude of ways including but not limited to mining, ranching, recreation, and tourism.

92. Comment: With limited money from the government, and certainly no anticipated maintenance funds from groups who request environmental designations removing land from profitable use, it is folly to take this land from economic use when it could benefit our state, its people and its ability to support existing recreation and wilderness areas. Why shouldn't groups who wish to set aside additional large tracts of productive land into non-productive fallow status be required to obtain the land in the same manner as the rest of us, by purchasing it? Why shouldn't they also be required, with their own funds, to maintain it? This should not be a burden doubly dumped on taxpayers by a vocal few for their privilege of private control at public expense."

    Response: A unique waters classification does not preclude the "economic use" of the Buehman Canyon Creek watershed. A unique waters classification results in a higher level of water quality protection and may result in more stringent regulation of land use activities that may affect water quality, but it does not necessarily preclude land use activities. Direct point source discharges to a unique water would be prohibited and for indirect discharges, [e.g., to tributaries] it would be necessary to demonstrate that there would be no degradation of existing water quality in Buehman Canyon Creek. Consequently, any mining activity in the watershed would need to be conducted in a manner that does not degrade ambient water quality in Buehman Canyon Creek.

    The nominated reach of Buehman Canyon Creek includes both public and private land. These lands are not being set aside by this unique waters classification.

Aravaipa Creek Unique Waters Nomination

93. Comment: Portions of Aravaipa Canyon were designated as a wilderness area in the 1st Arizona Wilderness Act. Additional wilderness in the canyon was designated by the Arizona Desert Wilderness Act of 1990. The addition of Aravaipa Creek to the list of unique waters in the state is consistent with its nationally recognized ecological significance.

94. Comment: Aravaipa Creek offers outstanding recreational, aesthetic and wilderness attributes. Aravaipa Canyon is an area of exceptional beauty. In addition to its physical characteristics, Aravaipa Canyon and Aravaipa Creek are of equally exceptional biological significance. The largely untrammeled riparian area is home to a lush plant community and abundant wildlife.

95. Comment: Aravaipa has cut a spectacular canyon, giving us a national treasure, and is certainly worthy of all the protection Arizona can muster.

96. Comment: The listed spikedace and loach minnow, as well as the threatened Colorado Roundtail Chub either actually or potentially inhabit the creek. Aravaipa Creek provides essential habitat for these species. Maintenance of the exceptional water quality...is essential to the continued existence of the threatened or endangered fish in the canyon.

97. Comment: The riparian area...offers a home or migratory route for a number of birds which are either threatened or endangered. Species such as the peregrine falcon, bald eagle, black hawk, gray hawk and the newly-threatened willow flycatcher find essential habitat in Aravaipa Canyon.

98. Comment: The native fishery of Aravaipa Creek is the most significant in the state.

    Response: Aravaipa Creek meets the necessary criteria for nomination as a unique water and the Department recommends that Aravaipa Creek receive that designation.

99. Comment: At Aravaipa Creek, we propose that the downstream boundary be extended to T6S R17E south boundary of the NE1/4 SE1/4 of Section 23. All of the private property in this segment is owned by The Nature Conservancy.

    Response: The original ADEQ nomination for Aravaipa Creek extended to the confluence of Holy Joe Canyon. However, during a public meeting held at Central Arizona Community College on April 14, 1995 local citizens requested that the nomination be restricted to within the BLM Wilderness boundary, and as requested, this change was made. At this late date, the Department believes that the boundary should not be extended downstream without an opportunity for the local citizenry to provide additional input on such a change.

Cave Creek and South Fork of Cave Creek Unique Waters Nomination

100. Comment: The Cave Creek watershed may be 1 of the most distinctive biological areas in North America. Because of its location near the border of Mexico and within natural wildlife corridors, the Cave Creek area is home to a diverse and unusual assortment of wildlife. The area is nationally known as a birdwatching and photographing location.

101. Comment: The ecological significance of the Cave Creek watershed is underscored by the critical habitat it contains for threatened or endangered species, such as the Northern Goshawk, peregrine falcon, Chiricahua leopard frog, Elegant Trogon, several bat species and several plant species.

    Response: Cave Creek and South Fork of Cave Creek meet the necessary criteria for nomination as unique waters, and the Department recommends that these water bodies receive that designation.

102. Comment: At Cave Creek it is our sense that there is often strong local support for environmental protection for Cave Creek. Based upon our awareness of landowner support for environmental protection initiatives, we recommend you further evaluate extending the downstream boundary of the Cave Creek segment from the Coronado National Forest boundary to the Cave Creek bridge adjacent to the Portal store. The Conservancy also owns a small portion of the creek in this segment. Please note that the Conservancy's support of the Cave Creek extension is predicated on local landowner support along the creek.

    Response: ADEQ agrees that there may be interest in extending the unique waters segment downstream towards Portal. However, at this late date there is insufficient time to evaluate local support for an extension of the nomination. If there is sufficient support, the Department could lengthen the unique waters reach during the next triennial review.

103. Comment: The Preamble to the proposed rules states on p. 2819 that Cave Creek and South Fork of Cave Creek "provide critical habitat for the following endangered or threatened species...." We suggest caution in the use of the term, "critical habitat" if it is not used to mean critical habitat as designated by the U.S. Secretary of the Interior pursuant to the Endangered Species Act. In the Endangered Species Act, "critical habitat" has a very specific meaning. There has not been a formal designation of critical habitat along Cave Creek or the South Fork of Cave Creek for the species listed in the Preamble. Cave Creek and the South Fork of Cave Creek clearly have exceptional recreational and ecological significance, criteria which qualify the waters as eligible for designation as a unique water.

    Response: ADEQ agrees that the term, "critical habitat," has a specific meaning under the Endangered Species Act and that there has not been a formal designation of critical habitat for Cave Creek or the South Fork of Cave Creek. However, while there has not been a formal designation of critical habitat, threatened and endangered species are known to be associated with these surface waters and they are of exceptional recreational and ecological significance.

104. Comment: We support the proposed designations of additional unique waters. However, we oppose the proposed change in

the 1st sentence of R18-11-112(F). Water quality standards for unique waters cannot and should not be limited to maintaining and protecting existing water quality. Under the Clean Water Act and EPA rules, water quality standards must be met whether or not existing water quality meets such standards. Where existing water quality violates standards, water quality planning and pollution control must be directed at restoring and improving water quality so that standards are achieved.

Response: ADEQ agrees that the proposed revision to the 1st sentence of R18-11-112(F) could be interpreted to mean that site-specific standards may only be established to maintain and protect existing water quality. While this is usually the purpose underlying the establishment of site-specific standards for a unique water, ADEQ did not intend to limit the purposes for which site-specific standards may be adopted. ADEQ revised the rule by restoring the language of the currently effective rule. The adopted rule states: "The following water quality standards apply to the listed unique waters..."

R18-11-113. Effluent Dependent Waters

105. Comment: The city of Phoenix supports the change from "effluent dominated waters" to "effluent dependent waters." The word, "dependent," better articulates the dependency of the stream segment in question to discharges of effluent to maintain an ecosystem and recognizes the uniqueness of that ecosystem. The term, "effluent dependent waters," is also more consistent with recent EPA guidance [i.e., EPA Region IX's *Supplementary Guidance for Conducting Use Attainability Analyses for Effluent Dependent Ecosystems*, April 1993].

Response: ADEQ agrees that the term, "effluent dependent waters" is preferable to "effluent dominated waters" for the reasons stated in the comment.

R18-11-114. Mixing Zones

No comments.

R18-11-115. Nutrient Waivers

106. Comment: Reference is made in R18-11-115(B)(3)(b) and R18-11-115(B)(4) to identification and protection of the nearest downstream water with perennial flow. Waters downstream may be intermittent and the state rule should reflect this.

Response: ADEQ agrees that the reference in R18-11-115(B)(3)(b) and R18-11-115(B)(4) to perennial waters may exclude an intermittent stream. ADEQ revised the rule to refer to "the nearest downstream surface water."

107. Comment: As in prior triennial reviews, we oppose the provision allowing nutrient waivers. Such waivers are not allowed by the Clean Water Act and implementing rules. If ADEQ wishes to weaken nutrient standards for a particular waterbody, it must do so via the water quality standards revision process.

Response: The currently effective nutrient waiver provision at R18-11-115 was reviewed and approved by the U.S. Environmental Protection Agency in the last triennial review of Arizona's water quality standards. EPA approves or disapproves standards provisions based on whether the provision meets the requirements of the Clean Water Act and its implementing regulations. EPA approval of the nutrient waiver rule means that nutrient waivers are consistent with the Act and its requirements.

R18-11-116. Resource Management Agencies

No comments.

R18-11-117. Canals and Municipal Park Lakes

108. Comment: The minor change to R18-11-117 adding "drains" is an improvement to the rule.

Response: ADEQ agrees. ADEQ understands that "drains" are distinguishable from "canals." R18-11-117 is intended to apply to both.

R18-11-118. Dams and Flood Control Structures

No comments.

R18-11-119. Natural Background

No comments.

R18-11-120. Enforcement

109. Comment: EPA recognizes that ADEQ is retaining language at R18-11-120(B) that refers to the use of practical quantitation limits as a general statement of enforcement policy. However, EPA maintains that PQLs are not water quality standards.

Response: EPA's comment reflects a fundamental misunderstanding of the purpose of the reference to practical quantitation limits [PQLs] in R18-11-120. ADEQ has never taken the position that PQLs are water quality standards. Water quality standards consist of designated uses and water quality criteria that are necessary to protect such uses. Arizona has adopted numeric water quality criteria which adequately protect designated uses using criteria derivation methodologies that have been approved by EPA. These water quality criteria are prescribed in R18-11-109 and Appendix A. The PQLs are not water quality criteria. The PQLs that are referenced in R18-11-120 are prescribed solely for purposes of enforcement when a water quality criterion is established at a concentration that is below the lowest level that can be reliably detected and quantified

during routine laboratory operations. The PQL is not a water quality criterion, nor does it change an applicable water quality criterion that has been established to protect a designated use. The PQL represents the concentration at which the state will take enforcement action for the violation of a water quality standard that is established at a concentration which cannot be reliably detected or quantified.

110. Comment: EPA recommends deletion of the reference to "a minimum rate of 1 grab sample per day" from R18-11-120(C).

Response: ADEQ disagrees that the reference to "a minimum rate of 1 grab sample per day" in R18-11-120(C) should be deleted. The language is necessary to ensure that at least 4 samples are collected over a 4-day period to determine compliance with aquatic and wildlife chronic criteria.

111. Comment: ASARCO recommends that the Department develop a narrow upset defense that would apply to temporary non-compliance with surface water quality standards due to exceptional events beyond the reasonable control of a permittee [e.g., storm-induced overflows from impoundments]. The burden of proof would be on the person asserting the upset defense. Such an upset defense would eliminate the discrepancy which currently exists between the National Pollutant Discharge Elimination System permit and the surface water quality standards. Under current NPDES regulations, a permittee has an affirmative defense against upset conditions that cause violations of technology-based permit limitations. However, a permittee does not have a similar defense if that same upset causes a violation of water quality-based permit limitations or results in a temporary exceedance of water quality standards in a receiving water.

Response: ADEQ disagrees. There is nothing in the Clean Water Act or its implementing regulations which recognizes an upset defense to violations of state-adopted water quality standards or water quality-based effluent limitations in NPDES permits. The fact that the NPDES regulations limit the upset defense to violations of technology-based discharge limitations argues against state recognition of this affirmative defense.

112. Comment: It is fundamentally dishonest to establish a water quality standard at a concentration that is below the practical quantification limit [PQL]. The PQL is defined as the lowest level of quantitative measurement that can be reliably achieved during routine laboratory operations. This means that a pollutant cannot be reliably measured below the PQL. To enforce a violation of a standard set below the PQL, where there can, by definition, be no reliable evidence to prove the violation, is a fundamental deprivation of due process under the Arizona and United States Constitutions.

Response: ADEQ disagrees. Water quality criteria that are established at the practical quantitation limit [PQLs] may not be adequately protective of designated uses. Moreover, PQLs will change as analytical technology improves. ADEQ agrees that enforcement of water quality standards at the PQL is appropriate. Reliable evidence of a violation of a water quality standard is a necessary prerequisite to any enforcement action. ADEQ believes that the PQL represents a reliable and quantifiable enforcement level.

113. Comment: We support deletion of the Appendix C PQLs, which is mandated by EPA's disapproval action. However, we object to the proposal to retain the 2nd sentence in R18-11-120(B) which indicates that water quality standards will be enforceable only at or above the PQL. This enforcement policy is not an appropriate part of the state's water quality standards and is contrary to law. The Act and EPA rules require water quality standards to be fully adequate to protect designated uses. The 2nd sentence of R18-11-120(B) effectively relaxes many of the state's standards to levels that are less than fully protective of designated uses. For this reason, EPA national guidance prohibits the use of detection limits [and by analogy, practical quantitation limits] as a basis for setting standards. This is not merely a matter of academic concern. PQLs can be as much as 1 million times higher than a water quality standard. This differential could be of great significance where, for example, a discharge will contain a pollutant at levels between the standard and the PQL. The mere fact that the concentration cannot be precisely measured at such levels does not mean that the discharge cannot be effectively controlled to reduce or eliminate concentrations in excess of the standard [i.e, via pollution prevention, product substitution, etc.]. Furthermore, even where concentrations cannot be measured below the PQL, that does not preclude setting a limit on the total daily quantity of pollutant discharge based on the water quality standard.

Response: ADEQ disagrees with the comment that the use of practical quantitation limits for enforcement purposes is inappropriate and contrary to law. PQLs were not used as a basis for setting water quality standards. ADEQ used methodologies for deriving numeric water quality criteria that are approved by EPA. The methodologies that were used as a basis for setting water quality standards are explained in detail in Appendix A. None of the approved methodologies employ detection limits or PQLs as a basis for deriving water quality criteria. The use of PQLs does not "relax" or change any water quality standard. The PQLs represent a practical response to the limitations of available analytical technology. ADEQ believes that is appropriate to define enforcement levels where numeric water quality criteria are established at concentrations that are below reliable levels of detection and quantification. Nothing in the Clean Water Act or its implementing regulations prohibits the use of PQLs as enforcement levels. Moreover, EPA had no objection to the use of PQLs for enforcement purposes provided the PQLs were not prescribed in rule. EPA's objection to prescribing PQLs in Appendix C of the water quality standards rules was based upon the concern that the PQLs could not be readily modified to keep pace with improvements in analytical technology.

Nothing in R18-11-120(B) precludes EPA from establishing NPDES permit limits based upon the total quantity of a pollutant discharged to comply with the water quality standard.

R18-11-121. Schedules of Compliance

114. Comment: The City of Mesa proposes that the following language be included in R18-11-121(A) and (C) to clarify the status of schedules of compliance for municipal stormwater discharges. ADEQ should modify R18-11-121(A) as follows:

A schedule to bring an existing point source into compliance with a water quality standard may be established in a National Pollutant Discharge Elimination System permit for an existing point source. A compliance schedule for an existing point source, other than a municipal stormwater discharge, shall require compliance with a discharge limitation based upon a water quality standard no later than 3 years after the date of the issuance of the National Pollutant Discharge Elimination System Permit.

R18-11-121(C) should be revised by adding the following language:

> The Department shall not require storm water discharges to comply with applicable water quality standards prior to February 18, 2006.

Response: ADEQ agrees that R18-11-121(A) should be amended to clarify that the 3-year limit on schedules of compliance for existing point sources does not apply to NPDES-permitted stormwater discharges. ADEQ disagrees with the suggested exemption of stormwater discharges from having to comply with water quality standards until February 18, 2006. ADEQ does not believe a blanket exemption from water quality standards until 2006 for stormwater discharges is consistent with the requirements of the Clean Water Act. Moreover, a blanket exemption may undermine the implementation of best management practices to achieve compliance with water quality standards.

115. Comment: The City of Tempe is deeply concerned over the effect of revisions to R18-11-121. ADEQ should not repeal the 10-year window for stormwater discharges to comply with water quality standards. It was the intent of the original rule to allow Congress time to resolve stormwater-related issues. Stormwater is really a nonpoint source discharge addressed by best management practices which is placed within the framework of a point source program. The City recommends that R18-11-121(C) be revised as follows:

> For permits subject to Section 402(p)(2) of the Clean Water Act, 33 USC §342(p)(2), the reasonable steps toward implementation of best management practices on a schedule specified in the permit shall constitute, until December 21, 2006, full compliance with water quality standards applicable to the permittee's activities.

Response: ADEQ disagrees. It is true that the intent of the original rule was to authorize schedules of compliance for NPDES stormwater permits and provide a 10-year "window" to comply with water quality standards. ADEQ also agrees with the commenter that stormwater discharges are best addressed within the framework of a nonpoint source control program and that compliance with water quality standards should be achieved through the implementation of best management practices. ADEQ chose the 10-year timeframe to give Congress adequate time to resolve stormwater / water quality standards issues as part of reauthorization of the Clean Water Act.

While Congress still has not reauthorized the Clean Water Act, ADEQ now believes that the 10-year timeframe should be repealed. A 10-year maximum timeframe is not consistent with federal regulations and EPA policy on schedules of compliance which require compliance as soon as possible but no later than any applicable statutory deadlines. EPA has generally limited schedules of compliance in NPDES permits to the term of the permit within which it is issued. Thus, the 5-year term of the NPDES permit is generally regarded as the maximum timeframe for a schedule of compliance. ADEQ believes that the maximum timeframe for a schedule of compliance should apply to NPDES-permitted stormwater discharges. Consequently, ADEQ amended R18-11-121(A) to clarify that the 3-year timeframe for schedule of compliance for existing point source discharges does not apply to NPDES-permitted stormwater discharges. The adopted rule authorizes schedules of compliance in NPDES stormwater permits. This will allow for the establishment of a schedule of compliance in the 1st round of NPDES stormwater permits. The adopted rule remains silent with regard to the maximum timeframe and leaves its establishment to the discretion of the permit-issuing authority.

ADEQ cannot adopt the language recommended by the commenter. While ADEQ may agree in principle, EPA Region IX has indicated that a rule which provides that implementation of best management practices shall constitute full compliance with water quality standards is <u>not</u> approvable. ADEQ will not adopt a rule which will be disapproved by EPA and which will lead to a federal promulgation.

116. Comment: The City of Tempe believes that elimination of the reference in R18-11-121(A) to the effective date of the water quality standard is a good change. We suggest that the trigger for a schedule of compliance be the effective date of the permit, not the date of issuance of the permit. The schedule of compliance will be a permit term, which should only be effective when the permit is effective. It will be inappropriate to require compliance with only 1 permit term while other permit terms are subject to change in the appeal process. It is also inequitable that a permittee would see its time for compliance slip away during the term of an appeal instituted by a 3rd party.

Response: ADEQ agrees that a schedule of compliance for an existing point source should run from the effective date of an NPDES permit rather than the date of issuance. ADEQ revised R18-11-121(A) in the adopted rule accordingly.

117. Comment: R18-11-121(A) should be revised to clarify that it does not apply to stormwater discharges. The City recommends the following language:

> A schedule to bring an existing point source OTHER THAN A MUNICIPAL SEPARATE STORM SEWER SYSTEM into compliance with a water quality standard may be established in a National Pollutant Discharge Elimination System Permit for the existing point source. A compliance schedule for an existing point source THAT IS NOT A MUNICIPAL SEPARATE STORM SEWER SYSTEM shall require compliance with a discharge limitation based upon a water quality standard no later than <u>5</u> years after the effective date of the National Pollutant Discharge Elimination System permit.

Response: ADEQ agrees that R18-11-121(A) should be amended to clarify that the 3-year limit on schedules of compliance for existing point sources does not apply to stormwater discharges. However, ADEQ disagrees with several of the suggested revisions to the rule. Inclusion of the phrase, "other than a municipal separate storm sewer system" in the 1st sentence could be interpreted to mean that a schedule of compliance could not be established in an NPDES stormwater permit. ADEQ also disagrees that the limit on schedules of compliance for existing point sources should be expanded from 3 years to 5 years. The Clean Water Act provides authority for states to establish schedules of compliance for new or revised water quality standards that are at least as stringent as those required for technology-based effluent limitations [See §303(e)(3)(A) and §303(e)(3)(F)]. These are typically limited to 3 years. Also, 3-year compliance periods are consistent with analogous provisions of the Clean Water Act. For example, §301(b)(2) of the Clean Water Act provides that technology-based effluent limitations shall be complied with as expeditiously as possible but no later than 3 years after effluent guidelines are promulgated. Similarly, §304(l) of the Act provides that point sources shall comply with individual control strategies within 3 years.

118. Comment: ADEQ is proposing to change the timeframes within which dischargers subject to an NPDES permit must achieve compliance with water quality-based discharge limitations. Currently, the schedule of compliance rule states that a compliance schedule for an existing point source discharger must require compliance with a water quality-based discharge limitation no later than 3 years after the effective date of the water quality standard. ADEQ is proposing to change the rule to provide that compliance must be achieved no later than 3 years after the date of the issuance of the NPDES permit. ADEQ also proposes to remove the limitation that compliance schedules may be issued only for water quality standards adopted after August 13, 1986. Phelps Dodge supports these changes as they would provide more flexibility in issuing compliance schedules to existing point source dischargers.

    Response: ADEQ agrees in part. ADEQ agrees that schedules of compliance should not run from the effective date of a water quality standard. However, ADEQ revised the proposed rule to clarify that a schedule of compliance for an existing point source must require compliance with a water quality-based discharge limitation no later than 3 years after the effective date of an NPDES permit, not the date of issuance of the permit.

    ADEQ agrees that the part of the rule which states that schedules of compliance are authorized for water quality standards adopted after August 13, 1986 should be deleted. However, ADEQ believes that the rule should be amended to clarify that a schedule of compliance may be established only for a "new or revised" water quality standard. This change would be consistent with §303(e)(3)(F) of the Clean Water Act which gives authority for schedules of compliance. §303(e)(3)(F) directs EPA to approve a state continuing planning process which includes, among other elements: "... adequate implementation, including schedules of compliance, for revised or new water quality standards...." [emphasis added].

    A schedule of compliance should be not be allowed for a water quality standard that was established prior to the current NPDES permit cycle for that discharge. ADEQ believes it is appropriate to authorize a schedule of compliance for any new or revised water quality standard that will be incorporated into the NPDES permit for an existing point source discharge when the NPDES permit is reissued.

119. Comment: ADEQ is proposing to delete the 10-year schedule of compliance for stormwater discharges. ADEQ's rationale for repealing the 10-year schedule of compliance for stormwater dischargers is circular. ADEQ states that it created the 10-year timeframe to allow time for the U.S. Congress to resolve stormwater related issues, such as application of water quality standards to stormwater, in the context of reauthorizing the Clean Water Act. ADEQ then states that because Congress is still grappling with the reauthorization of the Act, it should repeal the 10-year schedule. This reasoning does not make sense. Because the reauthorization of the Clean Water Act is still pending, stormwater related issues are still unresolved. The 10-year "window" should be retained until stormwater issues are resolved.

    Additionally, ADEQ adopted the 10-year timeframe only 4 years ago. ADEQ arguably recognized that reauthorization of the federal Clean Water Act could take longer than 4 years. The 10-year timeframe clearly should not be removed from Arizona's surface water quality standards.

    Response: ADEQ disagrees. ADEQ chose the 10-year time limit for schedules of compliance for stormwater discharges to allow time for the resolution of issues related to the application of water quality standards to stormwater discharges in the context of Clean Water Act reauthorization. However, the 10-year timeframe is not consistent with Clean Water Act provisions which prescribe maximum time limits for compliance schedules [See §301(b)(2) and §304(L)]. ADEQ believes that the maximum timeframe for a schedule of compliance in a NPDES stormwater permit should be limited to the term of the NPDES permit. Thus, the maximum timeframe for a schedule of compliance should be limited to 5 years.

120. Comment: ASARCO strongly supports eliminating the restriction that compliance schedules may be granted only with respect to water quality standards adopted after August 13, 1986 and statement in rule that compliance must be achieved within 3 years of the date an NPDES permit is issued.

    Response: ADEQ agrees that the reference to water quality standards established after August 13, 1986 should be eliminated. Schedules of compliance should only be available for new or revised water quality standards [See response to Comment #118]. ADEQ revised the R18-11-121(A) to authorize schedules of compliance for up to 3 years of the effective date of an NPDES permit.

121. Comment: The Department's proposal to delete the 10-year time period for a schedule of compliance for a stormwater discharge could be interpreted as meaning that stormwater discharges must immediately comply with surface water quality standards. The Department may want to consider language that would preclude such an interpretation.

    Response: ADEQ disagrees. A schedule of compliance refers to an enforceable sequence of interim requirements in a

NPDES permit which lead to ultimate compliance with NPDES water quality-based permit conditions. A schedule of compliance is prescribed in a NPDES permit because immediate compliance cannot be achieved. By its very nature, a schedule of compliance acknowledges that there will be a delay in compliance. A rule which authorizes a schedule of compliance cannot reasonably be interpreted to require immediate compliance.

122. Comment: ADEQ is proposing to eliminate the sentence in R18-11-121(C) which establishes a 10-year time frame for a schedule of compliance for a stormwater discharge. If this sentence is eliminated, a careful reading of the proposed rules indicates that anyone issued a storm water permit will have 3 years from the date of permit issuance to come into compliance with water quality standards. This would effectively reduce by 3 years the time of compliance for all major municipalities in Arizona who will probably be issued a stormwater permit this year. If it was ADEQ's intention that no specific date be set for water quality standards compliance for storm water discharges until after Congress reauthorizes the Clean Water Act, then more clear and specific language needs to be added to these proposed rules to indicate this. We request that R18-11-121(A) be modified to read as follows:

A schedule to bring an existing point source into compliance with a water quality standard may be established in a National Pollutant Discharge Elimination System permit for the existing point source. A compliance schedule for an existing point source, other than a municipal stormwater discharge, shall require compliance with a discharge limitation based upon a water quality standard no later than 3 years after the date of issuance of the National Pollutant Discharge Elimination System permit.

Response: ADEQ agrees. ADEQ revised R18-11-121(A) to clarify that it does not apply to stormwater discharges.

123. Comment: The proposed rule would eliminate the 10 years currently allotted for schedules of compliance in stormwater NPDES permits. This could be interpreted to limit schedules of compliance in stormwater permits to the 3 years provided under R18-11-121(A). The City recommends that ADEQ revise R18-11-121(C) as follows:

National Pollutant Discharge Elimination System Permits issued for municipal separate storm sewer systems shall provide a schedule for implementing best management practices as provided by §402(p)(2) of the Clean Water Act, 33 USC §1342(p)(2). The best managment practices shall be those activities that are reasonable, cost-effective, and necessary for the permittee's activities to meet the requirements of these water quality standards. The implementation of the best management practices shall constitute compliance with these water quality standards with respect to the permittee's activities. Any such compliance schedule shall not require that the permittee's activities comply with these water quality standards prior to December 31, 2003.

Response: ADEQ agrees that the proposed rule could be interpreted to limit schedules of compliance for NPDES-permitted stormwater discharges to 3 years. ADEQ revised R18-11-121(A) to clarify that the 3-year limit on schedules of compliance does not apply to stormwater discharges. ADEQ disagrees with the suggestion to revise the rule to state that implementation of best management practices shall constitute full compliance with water quality standards. EPA Region IX has stated that such a provision would not be approvable. While the recommended revision is consistent with ADEQ's current position that water quality-based discharge limitations should not be written into NPDES stormwater permits and that the control of pollutants in stormwater is appropriately addressed within a nonpoint source framework, ADEQ will not adopt rule language which will be disapproved by EPA and which will lead to a federal promulgation of water quality standards in this regard.

124. Comment: Pima County requests that ADEQ replace the current language found in R18-11-121(C) with the following language:

> For permits subject to Section 402(p)(2) of the Clean Water Act, 33 USC §1342(p)(2), the reasonable steps toward implementation of best management practices on a schedule specified in the permit shall constitute, until December 31, 2006, full compliance with water quality standards applicable to the permittee's activities.

Response: ADEQ disagrees that R18-11-121(C) should be revised to state that implementation of best management practices shall constitute compliance with water quality standards for the reasons stated in the response to the previous comment.

125. Comment: The proposed changes to R18-11-121 are problematic. First, while the change in R18-11-121(A) results from a valid concern, it does not take into consideration the fact that a NPDES may be appealed. Rather than requiring compliance no later than 3 years from the date a permit is issued, the compliance date should be 3 years from the date that the permit is effective.

Response: ADEQ agrees that a schedule of compliance for an existing point source should require compliance no later than 3 years from the effective date of the permit.

126. Comment: There is no valid reason for deleting the 10-year window provided in R18-11-121(C) for stormwater discharges. The 10-year window was originally established for good reason and if Congress does not address stormwater discharges, then stormwater discharges will be subject to the 3 year limit proposed in the revised R18-11-121(A). The 10-year window should be retained.

Response: ADEQ disagrees that the 10-year "window" should be retained. The 10-year window of compliance established in the last triennial review deferred grappling with the real issue presented by NPDES stormwater permits and water quality standards. That is, should water quality-based discharge limitations be written into NPDES stormwater permits? The 10-year time frame provided the permit-issuing authority [EPA] with the flexibility to defer water quality-based discharge limitations in the 1st round of NPDES stormwater permits. It also provided time for Congress to answer questions regarding the applica-

tion of water quality standards to stormwater discharges in Clean Water Act reauthorization.

Four years later, the Clean Water Act has not be reauthorized. At this point, ADEQ does not believe that the 10-year "window" should be retained. Instead, ADEQ believes that the rule should simply authorize schedules of compliance for stormwater discharges and remain silent with regard to a maximum timeframe. This will authorize schedule of compliances in the 1st round of NPDES stormwater permits and provide time to complete Clean Water Act reauthorization and resolve the stormwater / water quality standards issues. ADEQ agrees that stormwater discharges should be treated like other nonpoint source discharges. That is, the control of the discharges of pollutants in stormwater should be addressed through the implementation of best management practices, not water quality-based discharge limitations. Hopefully, Congress will agree with the state's position, amend the Clean Water Act, and clarify how stormwater discharges may achieve compliance with water quality standards. ADEQ can then amend rule in a future triennial review.

127. Comment: The current rule allows only 3 years for a schedule of compliance. This is far too short. ADEQ borrowed this time from EPA rules for technology-based effluent limits. However, R18-11-121(A) applies to water quality-based permit limits, which require a longer time for compliance. When EPA issues techology-based permit limits, it has already done a great deal of preparatory work to identify the necessary technology. This background work has not been done for water-quality based limits. The effort to determine the appropriate control techniques to meet water quality-based limits may consume 3 years by itself. Additional time would then be needed to design, construct and implement the control technique. The City requests that the 3-year time be lengthened to not less than 5 years.

Response: ADEQ disagrees that the limit on schedules of compliance for existing point sources should be expanded from 3 years to 5 years. The Clean Water Act provides authority for states to establish schedules of compliance for new or revised water quality standards that are at least as stringent as those required for technology-based effluent limitations [See §303(e)(3)(A) and §303(e)(3)(F)]. Schedules of compliance for technology-based effluent limitations are typically limited to 3 years.

128. Comment: The rule for allowing compliance schedules is contrary to the Act for the same reasons as the variance provision. Indeed, a compliance schedule is simply a type of variance. Further, ADEQ is proposing to worsen this provision by allowing compliance schedules to run from the date of NPDES permit issuance, rather than the date of adoption of the standard. This would effectively allow some dischargers up to 8 years to meet new standards, where, for example, a new standard is adopted just after a permit has been issued, and the next permit is not issued until 5 years therefter. Moreover, the rule does not limit compliance schedules to newly adopted standards. Thus, a discharger who is violating a standard 1st adopted 15 years ago could nonetheless ask for a compliance schedule to allow yet more time to comply. Such untenable results are not justified by the supposed difficulty of determining when a standard was 1st adopted. Prior versions of the state's water quality standards are readily available, and ADEQ can easily compile this information and make it accessible to interested persons.

Response: ADEQ disagrees that the schedule of compliance rule is contrary to the Clean Water Act. The Clean Water Act provides authority for states to establish schedules of compliance for new or revised water quality standards that are at least as stringent as those required for technology-based effluent limitations [See §303(e)(3)(A) and §303(e)(3)(F)].

ADEQ agrees that a schedule of compliance should only be available for a "new or revised" water quality standard and has revised the rule accordingly. ADEQ believes that it is consistent with the Clean Water Act to allow the time period for a schedule of compliance to run from the effective date of an NPDES permit. It is true that the rule, in the "worst case" example provided in the comment, theoretically allows up to 8 years to meet a "new or revised" water quality standard. It should be noted that the rule authorizes schedule of compliances. The rule does not mandate that a schedule of compliance be established with the maximum 3-year term. The NPDES permit-issuing authority [i.e., EPA] may establish a schedule of compliance in an NPDES permit, but is not required to do so. Moreover, the permit-issuing authority may require compliance "no later than 3 years" after the effective date of the permit. A shorter schedule of compliance may be established in the NPDES permit.

129. Comment: We are also concerned about the proposed language on stormwater permits. We do not believe that the current language allowing for 10-year compliance schedules is either legal or sensible for the same reasons stated in the previous comment. We are concerned that ADEQ is now intending to allow unlimited compliance schedules for stormwater permits. That would be an even more untenable approach. We urge ADEQ to delete the stormwater compliance schedule provision in its entirety.

Response: ADEQ disagrees. ADEQ believes that schedules of compliance are explicitly authorized by the Clean Water Act. Moreover, a schedule of compliance for a storm water permit is sensible and necessary when it is unclear how a stormwater discharge may comply with water quality-based discharge limitations. ADEQ revised R18-11-121(C) by deleting the 10-year timeframe for schedules of compliance in NPDES stormwater permits. The adopted rule is silent with regard to a maximum timeframe. However, ADEQ believes that the maximum timeframe should be limited to the term of a NPDES stormwater permit.

R18-11-122. Variances

130. Comment: ADEQ's proposed variance provision does not give the state as much flexibility as it could and should have. ADEQ's proposed variance regulation is not as broad or as flexible as allowed by other states [e.g., Colorado] or by EPA guidance. To be as useful as possible, the proposed variance provision should be amended to allow temporary variances for both point source and nonpoint source discharges. EPA has not objected to extending variances to nonpoint source discharges. In fact, EPA has approved such provisions in states like Colorado. Colorado's surface water quality standards regula-

tions have an EPA-approved variance procedure that applies to human-induced conditions deemed correctable with a 20-year period such as 1) nonpoint source pollution which cannot be currently controlled using best management practices; 2) deposition of instream toxicants due to past nonpoint source activities which can be removed by natural processes or human efforts, and 3) other conditions which are correctable but for which time will be required to implement measures to achieve compliance with the standard.

Response: 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 5 years and 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.

131. Comment: The criteria for granting variances should be as varied as possible, thereby allowing the Director to grant temporary variances in all appropriate cases. EPA guidance specifically lists several criteria not included in ADEQ's proposed variance provision. Also, variance regulations approved by EPA in other states, such as Colorado, include additional examples of appropriate criteria.

Response: ADEQ disagrees. 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 5 of the grounds cited in 40 CFR 131.10(g) are appropriate for a discharger-specific variance. These 5 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 these 5 grounds may support the removal or downgrade of a designated use of a surface water, they are not ideally suited for making a decision on a variance for a specific discharger. For example, it is not immediately clear how "naturally occurring pollutant concentrations which prevent attainment of the water quality standard" may be applied to a individual discharger. While it may not be possible to comply with a water quality standard because naturally occurring pollutant concentrations in the surface water, it is difficult to see why an individual discharger should be granted a variance from a water

quality standard on this ground. If it is not possible 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 temporary variance for an individual discharger is not appropriate because it is unlikely that compliance with the water quality standard may ultimately be achieved where naturally occurring pollutant concentrations in a surface water prevent attainment.

The 1 element in 40 CFR 131.10(g) which may be applied on a discharger-specific basis relates 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 1st 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 FR 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, the only ground that can be practically applied to support a request for a variance in such situations is the "widespread and substantial economic and social impact" factor. For these reasons, ADEQ declines to broaden the grounds for a variance. ADEQ did amend the proposed variance provision to more closely follow the language of the "widespread and substantial economic and social impact" factor as expressed in 40 CFR 131.10(g).

132. Comment: Variances should be allowed for specific water bodies or segments, not just for specific dischargers. According to EPA, this would "relieve dischargers from the burden of demonstrating that individual variances are appropriate and allow multiple dischargers to pool their resources to obtain a single variance and then to start work on solving the underlying problem."

Response: ADEQ disagrees. 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 a temporary modification of a water quality standard which can only be done through rulemaking.

The suggestion by the commenter to allow for "waterbody variance" is consistent with an approach to variances that EPA is considering. EPA has stated in a preliminary draft of the Advanced Notice of Proposed Rulemaking for the federal water quality standards regulation that it is considering the approach of dividing variances into 2 categories: waterbody variances [to which the 1st 5 designated use removal elements in 40 CFR 131.10(g) apply] and discharger-specific variances [to which the "substantial and widespread economic and social impact" factor applies].

While state 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 easily distinguishable from the factors which 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 response is the removal of the designated use, not the issuance of a variance that is limited in duration. In general, a variance should be used only where the state believes that a water quality standard can ultimately be attained. The 5 grounds in 40 CFR 131.10(g) [other than "widesread and substantial economic and social impact"] which would support a "waterbody variance" are essentially permanent in character. It is unlikely that where such conditions exist in a surface water, that those conditions will change in the short term or that the water quality standard may ultimately 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 modi-

fications; physical conditions related to the natural features of a surface water; or human caused sources of pollution that cannot be remedied or would cause more environmental damange to remedy, it is unlikely that the water quality can be attained, even in the long term. Where such conditions exist, a use attainability analysis should be conducted to remove or permanently downgrade the designated use.

133. Comment: The proposed variance procedure allows ADEQ to grant a variance only for 1 narrow ground [i.e., upon a demonstration that treatment more advanced than that required to comply with technology-based effluent limitations is necessary to achieve compliance with the water quality standard and it is not technically or economically feasible to achieve compliance within the next 5 years]. ADEQ also is proposing to limit the variance provision to point source discharges. ADEQ should amend the proposed variance provison to be as useful and flexible as possible by 1) including all 6 factors identified in 40 CFR 131.10(g); 2) extending the variance provision to nonpoint source discharges; and 3) allowing variances for specific water bodies or segments. A flexible and useful variance prvision would permit ADEQ to creatively address and resolve environmental problems. Such a variance provision also would temper the fact that water quality standards are enforceable against any person [regardless of whether the person discharges through a point or nonpoint source] who causes a violation of a water quality standard.

    Response: ADEQ disagrees. See responses to Comments #131 and #132.

134. Comment: The Department should include all 6 factors listed in 40 CFR 131.10(g) as bases for granting a variance. Basing a variance on the 40 CFR 131.10(g) factors would allow the variance procedure to be used in situations where the need for a variance is 1) temporary, and 2) in anticipation of a permanent removal or downgrading of a designated use via a use attainability analysis.

    Response: ADEQ disagrees. See response to Comment #131 and #132.

135. Comment: ADEQ should clarify that a lesser showing must be made to support a variance than must be made to support a permanent change in the designated use of a water segment. Because a variance is a temporary, short-term change and subject to periodic review and scrutiny, the burden of proof for a variance clearly should be less than the burden of proof for a use attainability analysis.

    Response: ADEQ agrees that since a variance is temporary and subject to periodic review, that a "burden of proof" that is less than that required for a permanent downgrade or removal of a designated use should be considered. Arguably, the application of the same substantive test and "burden of proof" which applies to the removal of a designated use through the use attainability analysis process to a variance provides little incentive for choosing the temporary variance over a permanent downgrade of a designated use. However, the adoption of rule language which articulates what the "burden of proof" is for a variance is not a straightforward task.

    The concept of a "burden of proof" has been developed through the law of evidence by the courts. A straightforward application of judicial concepts of burden of proof to an administrative process like a request for a variance is not entirely successful. In general, the "burden of proof" refers to the necessity or duty of affirmatively proving a fact in dispute on an issue raised between the parties in any cause. The term generally includes 2 different concepts: 1) the "burden of persuasion" which traditionally never shifts from 1 party to the other at any stage of a court proceeding; and 2), the "burden of going forward with the evidence," which may shift back and forth between the parties as a trial progresses. Of these 2 general concepts, the most applicable to the variance process is the concept of the burden of persuasion. In general, a person who requests a variance has the burden of persuasion for each of the required elements specified in the variance rule. The burden of persuasion may require a party to establish the existence or nonexistence of a fact by a preponderance of the evidence, by clear and convincing proof, or by proof beyond a reasonable doubt. Except as otherwise provided by law [e.g., criminal cases], the burden of proof requires proof by a preponderance of the evidence. In general, a preponderance of the evidence appropriately describes the burden of proof that applies to the variance process. While in theory, the burden of proof that applies to a variance request should be less than that which applies to the removal of a designated use because a variance is temporary, ADEQ does not believe this concept can or should be developed in rule.

136. Comment: The addition of the rule on variances is timely and necessary. However, there is a considerable lack of understanding in the general populace about the limitations a regulated entity has when obtaining a variance and the performance requirements that are associated with such a variance. I would suggest that some additional explanatory language accompany the final rule. The Department may even wish to develop a separate explanation of how the rule will work.

    Response: ADEQ agrees that a variance procedure is a necessary component of the water quality standards rules. ADEQ also agrees that additional guidance on variances may need to be developed to further explain the rule.

137. Comment: ADEQ is to be commended for the new variance proposal. The Department should note that there are local governments in the State that may be in a position to qualify for a variance. For example, a small community may not be able to fund the necessary treatment and disposal system to comply with a standard simply because of a lack of bonding capacity to construct the facility. Presumably, this is the kind of economic impact which will be considered when an application for a waiver is evaluated.

    Response: ADEQ agrees. The determination of whether a small community can fund necessary treatment in excess of technology-based requirements and whether such treatment would cause a "substantial and widespread economic and social impact" is an example of the kind of factor that may be considered by ADEQ in deciding whether to grant a discharger-specific variance.

138. Comment: The City supports the procedures for granting a variance for the reasons articulated in the preamble to the proposed rules. The provision will allow flexibility for communities that cannot meet water quality-based discharge limitations, on a short-term basis, because of technological limitations or substantial economic hardship. An example might be a small community or town wastewater treatment plant that does not have the immediate resources to comply with a particular standard. It is not practical to shut the town down in order to eliminate the discharge. A variance allows the facility to remain in compliance while they obtain the funds to carry out the activities necessary to ultimately comply with the standard.

    Response: ADEQ agrees.

139. Comment: The water quality standards should allow consideration of any or all of the factors listed in 40 CFR 131.10(g) when determining whether a variance should be granted. EPA policy provides for consideration of all of those factors [Water Quality Standards Handbook, §5.3]. Consideration of any 1 or more of the §131.10(g) factors would further public policy and is consistent with the intent of the variance provision to allow temporary deviation from a designated use that is temporarily unattainable. This provision could be very helpful for stormwater discharges. This recommended change is necessary to allow stormwater dischargers potentially needed time to evaluate best management practices [BMPs] to decide whether further BMPs are needed to meet water quality standards. This is particulary necessary because ADEQ proposes to add the fish consumption designated use to the Salt River which may have unanticipated impacts on the municipal stormwater program.

    Response: ADEQ disagrees that variances should be allowed for all of the grounds specified in 40 CFR 131.10(g) for reasons stated in responses to previous comments. ADEQ does not believe that 5 of the factors in 40 CFR 131.10(g) support a temporary variance that is issued to a specific discharger. ADEQ agrees that a variance may be requested for a stormwater discharge.

140. Comment: The proposed variance provision is flatly contrary to the Clean Water Act and EPA rules. Under the Act, water quality standards are absolute. Economic impacts can be considered to a limited degree in determining whether a use is attainable, but once the use is designated, all dischargers must comply with the standards adopted to protect that use. The Act does not allow for discharger-specific variances from standards, and we do not believe that EPA has authority to hold otherwise.

    Further, the proposed variance provision does not meet the following requirements of EPA's policy on variances: a) The variance procedure must involve the same substantive and procedural requirements as apply to removing a designated use [e.g., completion of a use attainability analysis]; b) Each individual variance must be adopted as a part of the water quality standards; c) The state must demonstrate that meeting the standard is unattainable based on 1 or more of the grounds specified in 40 CFR 131.10(g) for removing a designated use. For example, if the source is claiming that standards cannot be met for economic reasons, it must show "substantial and widespread economic and social impact" not merely economic infeasibility for the particular facility; and d) The variance can last no more than 3 years, not 5, and cannot be renewed unless the discharger makes a new demonstration of unattainability [EPA, Water Quality Standards Handbook, 2nd Ed. at 5-12].

    In addition, the proposal is void for vagueness because it offers no definition whatsoever for economic or technical infeasibility. Doubtless some industries will argue that pollution controls are economically infeasible if they will reduce profits. That is hardly a basis for allowing unsafe levels of pollutants in public waters. We strongly urge ADEQ to delete the variance provision in its entirety. Variances are antithetical to the whole idea of restoring and maintaining water quality in the state's rivers and lakes.

    Response: ADEQ agrees in part and disagrees in part. The variance provision is not flatly contrary to the Clean Water Act as alleged by the commenter. The federal water quality standards regulation provides at 40 CFR 131.13 that states may, at their discretion, include in their state water quality standards, policies affecting their application and implementation, such as variances. Also, EPA has formally indicated the allowability of state variance provisions in several administrative decisions [See Decision of the General Counsel No. 44 (June 22, 1976); Decision of the General Counsel No. 58 (March 29, 1977)] and in guidance documents [See §5.3, Variances From Water Quality Standards, Water Quality Standards Handbook, 2nd Ed., p. 5-11]. EPA has approved state variance provisions and has promulgated a federal variance procedure in the Great Lakes Water Quality Initiative regulations [See 60 FR 15415 [March 23, 1995].

    ADEQ agrees that EPA policy on variances provides that variance procedures involve the same substantive and procedural requirements as those which apply to removal of a designated use. However, EPA also acknowledges that there are differences between the requirements for removal of a designated use and a variance. Unlike the use attainability process, variances are both discharger and pollutant-specific, are time-limited, and do not result in a modification of the designated use. EPA guidance states that EPA will approve state variance procedures if:

    1. Each individual variance is included as part of the water quality standard;
    2. The state demonstrates that meeting a water quality standard is unattainable based on 1 or more of the grounds outlined in 40 CFR 131.10(g) for removal of a designated use;
    3. It is demonstrated that treatment more advanced that that required by §303(c)(2)(A) and (B) has been carefully considered and that alternative effluent control strategies have been evaluated;
    4. The water quality standard for which a variance is requested is binding upon all other dischargers on the stream segment;
    5. The discharger who is given a variance for 1 specific pollutant is required to meet applicable water quality criteria for other constituents;
    6. The variance is granted for a specific period of time and must be rejustified upon expiration at least every 3 years;

7. The discharger either must meet the water quality standard upon the expiration of the term of the variance or make a new demonstration of unattainability;

8. Reasonable progress is being made toward meeting the water quality standard; and

9. The variance was subjected to public notice, opportunity for comment, and public hearing.

The adopted rule meets all of the above criteria except for 2. First, under the state variance procedure, a variance is not included as part of a water quality standard. Under the state-adopted rule, a variance is included as part of the NPDES permit for a specific discharger. While not entirely consistent with stated EPA guidance, ADEQ believes that this approach is appropriate since variances are granted on a discharger-specific basis and do not result in a modification of a water quality standard. Second, the state variance procedure provides for a term of 5 years, not 3 years. Again, since a variance may be granted only to a specific discharger, it is logical to tie the term of the variance to the NPDES permit cycle for that discharger. A 5 year term for a variance should be approvable by EPA. In fact, despite the statement in EPA guidance that variances should be rejustified every 3 years, EPA's own variance procedure in the Great Lakes Water Quality Initiative prescribes a maximum timeframe for a water quality variance of 5 years or the term of the NPDES permit for a point source discharge, whichever is less. The state rule requires a discharger to demonstrate that all the required elements for a variance are met before a variance is renewed.

ADEQ agrees with the commenter that the ground for a variance should be substantively the same as that which applies to removal of a designated use. ADEQ revised the rule to incorporate the "widespread and substantial economic and social impact" ground at 40 CFR 131.10(g)(6). ADEQ agrees that the "economic infeasibility" ground stated in the proposed rule may have been void for vagueness because it lacked decision criteria for determining economic infeasibility. Moreover, the economic infeasibility test is inconsistent with EPA guidance on approvable grounds for a variance. The adopted rule solves this problem by linking the substantive ground for the variance to the "widespread and substantial economic and social impact" factor in 40 CFR 131.10(g).

R18-11-123. Prohibition Against Discharge; Sabino Creek

No comments.

App. A. Numeric Water Quality Criteria

Partial Body Contact

141. Comment: ADEQ has used the same reference dose for both full body contact and partial body contact. The risk of exposure from partial body contact is substantially different from the risk of exposure in full body contact. The direct use of a reference dose for ingestion is not appropriate, nor is the use of a maximum contaminant level for drinking water. A specific example is that of arsenic. ADEQ notes that the use of a reference dose results in a concentration that is lower than the National Primary Drinking Water maximum contaminant level for arsenic. The MCL is based upon a lifetime exposure of drinking 2 liters of water every day with an adequate safety factor. To regulate ephemeral streams and EDWs which have a water quality standard based upon a MCL is unjustified. The use of the 1-day health advisory for children is an overly protective basis for PBC standards but appears to have relevance.

Response: In developing the present Partial Body Contact (PBC) water quuality standards, ADEQ used criteria derivation protocols established in the 1992 triennial review with the modification that 10-day and long term health advisories are no longer used. Instead, 1-day children's health advisories were used. Depending on data availability, the following procedures were used to determine standards for the partial body contact designated use in their order of preference:

1. One-day children's health advisories;

2. The EBASCO method of using the reference dose [Rfd] for computing the water quality criterion for a parameter where there is no published 1-day health advisory or the 1-day health advisory has been withdrawn [NOTE: The EBASCO method was used in the last triennial review to derive PBC water quality criteria. The EBASCO method for deriving PBC criteria was recommended by the regulated community in the last triennial review and is described in detail in an attachment to this concise explanatory statement [See Rationale for the Development of Toxic Pollutant Standards to Protect Human Health (March 12, 1996), p. 5-7].

3. If a maximum contaminant level for drinking water is less stringent than a water quality criterion for the PBC designated use that is derived using either the 1-day health advisory or the EBASCO method, then the MCL was substituted.

With regard to arsenic, the PBC water quality criterion was calculated using the RfD with a result of 42 ug/L. Because the MCL for arsenic (50 ug/L) was less stringent and the health advisory that the 1992 standard was based on had been withdrawn, the MCL was used as the PBC water quality criterion.

Hardness dependent metals

142. Comment: ADEQ is correct in revising the footnote to establish the hardness value as the hardness of the receiving water. In all cases, hardness should be that of the ambient water. The site-specific metals study of the Santa Cruz River, submitted to ADEQ in September, 1995, documents the range and nominal variation of the hardness of the ambient water which flows periodically in the Santa Cruz. The hardness of the monitored natural flow from precipitation events ranged from 324 mg/L to over 3000 mg/L. As demonstrated in the site-specific metals study, the increasing hardness reduced the toxic species of the various metals. As an example, in the particular case of lead, the distribution of the toxic forms of lead decreased with

increasing hardness of stormwater flows. The principal lead species [over 90% of the total] changed from $Pb(CO_3)_2$ to $PbCO_3$ during stormwater events but did not revert or release the toxic specie Pb^{+2}. Since stormwater events routinely exceed a hardness level of 400 mg/L, for ephemeral and EDW waters, the hardness value at 400 mg/L should be fixed unless site-specific conditions demonstrate a reduced hardness during storm events.

Response: ADEQ agrees that the hardness of the receiving water should be used to derive hardness dependent water quality criteria for metals. ADEQ also agrees that a hardness cap of 400 mg/L should be imposed because the data base used for the development of the §304(a) criteria guidance for hardness-dependent metals does not include data which supports extrapolation of the hardness effects of metal toxicity beyond a hardness of 400 mg/L as calcium carbonate.

143. Comment: Many chemical and physical aspects of stormwater runoff make it difficult to quantify and compare to the current and proposed surface water quality standards for hardness dependent metals. Deciding how to arrive at an appropriate and fair hardness determination for stormwater runoff is 1 of these difficult aspects. Due to the fact that hardness is used in the calculations for determining metals standards, it becomes a critical factor for obtaining an accurate and fair standard for a point source discharge to meet. ADEQ's latest proposal of where to obtain a sample for hardness is not accurate or fair for a stormwater discharge. If hardness is determined from the effluent [i.e., stormwater] being discharged to an ephemeral stream, then the metals standard will probably always be more stringent than it would be if hardness is determined from water flowing in the stream as a direct response to rainfall, or if hardness is determined from an average of hardness found in the receiving water on a historical basis. This occurs because storm water is initially low in hardness until it has had sufficient time of contact with the land surface and specifically soil to adsorb carbonates found in the receiving environment. ADEQ should develop an acceptable strategy for allowing a discharger to use the current or historical hardness of the wate flowing within the receiving stream during a runoff event as the hardness level to be used in the metals standards calculations. At a minimum, ADEQ should insert language in the proposed rule that would allow hardness to be measured from within the receiving stream segment, whether ephemeral or effluent dependent, as long as the stream segment is carrying storm water runoff at the time the compliance sample is collected from the point source.

Response: ADEQ is not in a position to develop scientifically-defensible stormwater standards for hardness-dependent metals. However, ADEQ agrees that the hardness of the receiving water should be used to determine numeric water quality criteria for hardness-dependent metals. See response to following comment.

144. Comment: The Department proposes capping hardness at 400 mg/L for hardness-dependent metals criteria when the discharge is to an ephemeral or effluent-dependent stream. ASARCO is concerned that capping the hardness of an effluent at 400 mg/L during storm events in Arizona could result in unattainable water quality standards, particularly because of the high hardness seen in ephemeral streams during these storm events. ASARCO believes that ADEQ needs to consider and develop separate stormwater water quality standards for hardness-dependent metals as well as for other parameters which take into account Arizona's arid environment.

Response: ADEQ agrees that the current water quality standards rules do not consider the unique nature of storm water runoff events. This problem exists across the United States as a result of a lack of national guidance/data on appropriate methods for developing storm water-specific standards. Coupled with this problem is the lack of adequate data which supports extrapolation of hardness effects on metal toxicity beyond a hardness of 400 mg/L as calcium carbonate. Up to now the lack of storm water-specific water quality standards has not affected the application of water quality standards, including a hardness cap, to NPDES stormwater permits as chemical-specific compliance monitoring is not being required in the 1st phase of NPDES stormwater permits. Hopefully, Congress will resolve issues related to stormwater discharges and compliance with state-adopted water quality standards in the debate over Clean Water Act reauthorization. Although the Clean Water Act has yet to be reauthorized, ADEQ believes that it is appropriate to wait for Congress to address the stormwater issue before investing considerable resources to develop storm water-specific standards.

145. Comment: EPA recommends that the state adopt a hardness cap of 400 mg/L as calcium carbonate for hardness dependent metals for all waters. 40 CFR 131.36(b)(4) specifies that the maximum hardness shall not exceed 400 mg/L as calcium carbonate, even if the actual ambient hardness is greater than 400 mg/L as calcium carbonate. The rationale for a cap on hardness is that we have no assurance that the toxicity mitigating effect of hardness applies beyond this hardness threshold.

Response: ADEQ agrees. The rationale for imposing a hardness cap is that the data base used for the development of the §304(a) criteria guidance for hardness-dependent metals does not include data which supports extrapolation of the hardness effects of metal toxicity beyond a hardness of 400 mg/L as calcium carbonate. In recognition of this fact 40 CFR 131.36(c)(4) states that the maximum hardness value for use in hardness-dependent metals equations shall not exceed 400 mg/L as calcium carbonate. In the proposed rules the Department proposed that if the receiving surface water is an ephemeral water or an effluent-dependent water, then the hardness of the effluent that is discharged is used to calculate the numeric water quality criterion. For these waters a hardness cap of 400 mg/L as calcium carbonate was imposed, even if the hardness of the effluent was greater than 400 mg/L as calcium carbonate. The Department also proposed that if the receiving surface water had an A&Ww or A&Wc designated use, then the hardness of the receiving water is used to calculate the numeric criterion. However, in this case no hardness cap was imposed. In order to be consistent with the federal regulation and the scientific rationale for the hardness cap, i.e., the database does not contain adequate data to extrapolate the hardness-dependent equations, a hardness cap of 400 mg/L is uniformly applied to all discharges regardless of the type of water body.

146. Comment: There is a substantial decrease in the numeric limit for silver between the existing water quality standard and the proposed hardness dependent formula. While no discussion or justification of the change is made in the proposed rule, the change to a value in the range of 10 ppb will create a substantial financial impact on the photographic products industry.

Work by the nationwide Silver Coalition has demonstrated that a regulatory value of 10 ppb is not scientifically based and does cause a severe economic impact on silver users. The toxicity of silver is primarily in the free ion [Ag^+] or the silver nitrate form. The Site-Specific Metals Partitioning Study, Phase II Final Report, submitted to ADEQ on September 8, 1995 demonstrated that of the dissolved fraction of silver, over 66% of the dissolved silver was combined with a chloride molecule which rendered the silver into a nontoxic form. The proposed formula for silver is incorrect and must be revised to not cause a widespread economic impact.

Response: ADEQ did not decrease the numeric water quality criteria for silver. The hardness-dependent formulas for the calculation of silver water quality criteria for all A&W uses, including effluent-dependent waters, are the same as the currently effective hardness-dependent formulas for silver.

147. Comment: The City of Phoenix supports ADEQ's position on the aquatic and wildlife standards for mercury. Currently, there is no scientifically justified mercury criterion for the protection of wildlife nationwide, let alone for the waters of the arid west. The City believes that the tissue monitoring program to be conducted in a cooperative effort between ADEQ, EPA, U.S. Fish & Wildlife Service, and the Arizona Game and Fish Department is the best approach to resolving the concerns. The program will characterize the problem, if any exists, and provide a foundation for developing a solution.

Response: ADEQ agrees. See response to following comment.

148. Comment: In its February 16, 1994 biological opinion on the state's last triennial review, the U.S. Fish & Wildlife Service found that the state's A&W standards for mercury are likely to jeopardize the continued existence of threatened and endangered species because the standards do not adequately protect against food chain accumulation. Instead of developing a fully protective standard, the state proposes merely to conduct a tissue monitoring program. There is no deadline for completion of this program, nor any commitment by ADEQ to develop fully protective mercury standards by any date certain. This approach does not satisfy the requirements of the Clean Water Act. The state must adopt standards that are fully protective of designated uses, including wildlife. As it stands now, the state's mercury standards do not meet this requirement.

Further, the proposed monitoring program is little more than a study to prepare for more study. Meanwhile, endangered birds and other species will be left without adequate protection. The study seems premised on the flawed notion that we must 1st find high levels of mercury in fish tissue before even thinking about setting protective standards. That approach is contrary to a major purpose of the water quality standards - namely, to prevent environmental harm before it occurs. Moreover the setting of a protective mercury standard does not require further sampling. A mercury standard to protect against food chain accumulation has already been established for the Great Lakes. A similar standard could be developed for Arizona. The Arizona standard might differ if there were evidence that mercury uptake rates among Arizona fishes are markedly different than among Great Lakes fishes, but ADEQ has offered no evidence to suggest that this is so. Further, ADEQ's proposed study does not appear to be directed at identifying such differences.

Finally, to the extent that ADEQ requires further evidence of mercury contamination, recent tests have found mercury levels averaging 1.63 mg/kg in fish in Arivaca Lake, and 1.44 mg/kg in fish in Pena Blanca Lake. These levels far exceed the 1.0 mg/kg level that ADEQ said would trigger the development of a protective mercury standard.

Response: ADEQ does not concur with the commentor's assertions that the state's currently effective water quality standards for mercury are not protective of designated uses, including wildlife. ADEQ used EPA methodologies and data to derive the numeric water quality criteria for mercury to protect Arizona's aquatic and wildlife designated uses. These methodologies are fully explained in Appendix B of the Concise Explanatory Statement which supports the state-adopted water quality standards [See Rationale For the Development of Toxic Pollutant Criteria to Protect Aquatic and Wildlife Designated Uses (January 10, 1992)].

For the state's aquatic and wildlife [cold water fishery] designated use, ADEQ employed the EPA methodology described in the national "Guidelines for Deriving Water Quality Criteria for the Protection of Aquatic Life and Its Uses" [Guidelines Methodology] to derive water quality criteria for mercury. The Guidelines Methodology calls for the calculation of a Final Residue Value [FRV] if a maximum permissible tissue concentration and at least 1 acceptable bioconcentration factor [BCF] determined from an aquatic animal species are available. The EPA Guidelines Methodology specifically states that 1 of the purposes for deriving a FRV is to protect wildlife, including fishes and birds, that eat aquatic organisms from demonstrated adverse effects [See 45 FR 79346 (November 28, 1980)]. ADEQ calculated an FRV for mercury using data from EPA's National Ambient Water Quality Criteria Document for Mercury. The FRV of 0.012 µg/L became the A&Wc and the A&Ww criteria to protect against chronic toxicity from mercury.

ADEQ also used the FRV procedure to calculate Arizona's aquatic and wildlife chronic standard for mercury in effluent dominated waters [A&W edw]. In an Addendum to the 1992 Concise Explanatory Statement which supported the state-adopted water quality standards, ADEQ stated:

The proposed standard was based on toxicity to aquatic life. However, mercury has a propensity to accumulate in tissues of aquatic life to levels that may be harmful to wildlife or human consumers. These routes of exposure should be considered in developing A&W standards. The EPA publication Ambient Water Quality Criteria for Mercury-1984 (Criteria Document) does not contain information regarding the effects of mercury on wildlife but does contain information on the effects of mercury on humans. Setting a standard based strictly on toxicity to aquatic life may not adequately protect wildlife. Therefore, ADEQ is using an FDA action level as a surrogate to protect wildlife. ADEQ recalculated the A&Wedw chronic standard for mercury using the more appropriate Final Residue Value procedure [See Guidelines].

The recalculated A&Wedw numeric water quality criterion to protect against chronic toxicity for mercury is 0.2 µg/L. The use of the Final Residue Value procedure to derive water quality criteria for the aquatic and wildlife designated uses demonstrates that Arizona considered bioaccumulative effects when it adopted water quality standards for mercury.

The state does not agree that the state monitoring program designed to assess the accumulation of mercury in the tissues of prey species of the endangered Bald Eagle, Yuma Clapper Rail, and Brown Pelican does not satisfy the requirements of the Clean Water Act. The state does not disagree that mercury may present a potential hazard to wildlife which occur in or otherwise utilize Arizona's streams, lakes, and riparian areas. However, the magnitude, class, and extent of this potential hazard is unclear at this time. To this end, the state in coordination with Arizona Game & Fish Department, USFWS, and EPA has proposed a monitoring program designed to assess the accumulation of mercury in the tissues of prey species of the endangered Bald Eagle, Yuma Clapper Rail, and Brown Pelican. This monitoring program has been accepted as the "reasonable and prudent alternative" satisfying the U.S. Fish and Wildlife Service jeopardy opinion:

"The jeopardy opinion remains unchanged by the mercury criterion. What has changed is the Service's reasonable and prudent alternative which initially required EPA to adopt mercury wildlife criteria that are protective of threatened and endangered species. After review and discussions with EPA and ADEQ, all parties agreed that there may not be enough information available to accurately determine mercury wildlife criteria. Instead the agencies will adopt a tissue monitoring program to assess the magnitude and extent of mercury bioaccumulation in the prey base of fish eating birds. The draft Arizona Priority Pollutant Sampling Program for 1996 describes this cooperative program. The Service supports this draft plan." (USFWS letter to EPA Region IX, January 17, 1996)

To protect mammals and birds that regularly consume fish and other aquatic organisms, the U.S. Fish and Wildlife Service based its jeopardy opinion at least in part on an action level of 0.1 ppm wet weight. (Eisler, R. 1987. Mercury hazards to fish, wildlife, and invertebrates: A synoptic review. U.S. Fish & Wildlife Service Biological Report 85 (1.10). 90 pp.). This action level was based on only 2 scientific studies. In the 1st study game farm mallards were fed dry duck mash containing 0.5 ppm (dry weight) mercury in the form of the seed fungicide and disinfectant methylmercury dicyandiamide (Heinz, G.H. 1979. Methylmercury: Reproductive and behavioral effects on 3 generations of mallard ducks. Journal of Wildlife Management 43: 394-401). While this study showed decreased reproductive success in mallards fed the fungicide containing diet, it would have been more applicable to natural conditions had it more closely resembled realistic food chain interactions. The 2nd study showed the accumulation of mercury in tissues of domestic laying chickens, but did not report ill effects caused by the accumulated mercury in the body (March, B.E., R. Poon, and S. Chu. 1983. The dynamics of ingested methyl mercury in growing and laying chickens. Poultry Science 62: 1000-1009).

ADEQ believes that using the priority pollutant program to determine the degree of protection that wildlife receives from mercury contamination is both practical and useful as this program is an example of agencies pooling expertise and scarce resources to identify and address pollution problems. Coordination among the EPA, the U.S. Fish & Wildlife Service (USFWS), the Arizona Game & Fish Department (AGFD), and ADEQ has resulted in the collection of useful data that pinpoints where agencies and other concerned parties should be directing tight resources to gain maximum benefit. ADEQ and cooperating agencies have also used the data that resulted from the priority pollutant program to initiate efforts to mitigate problems when identified. The most recent example of such an effort is the cooperation occurring among the Arizona Game and Fish Department, the U.S. Forest Service, the Arizona Department of Health Services, and ADEQ to address mercury contamination in fish at Peña Blanca Reservoir in southern Arizona.

ADEQ disagrees that the Great Lakes Water Quality Initiative [GLWQI] protocols should be used to develop mercury water quality standards for Arizona. Regardless of the scientific quality of the work that was done to develop the GLWQI, it is clear that applying the results of that work to Arizona is not scientifically defensible. This conclusion is supported by the EPA Directors of the Standards & Applied Science and Health & Ecological Criteria Divisions at EPA Headquarters:

> "... [the] EPA would not consider applying specific Guidance elements outside the [Great Lakes] basin in situations where they are not scientifically or technically defensible. For example the provisions for BCCs may not be appropriate in systems not having the long retention times and other chemical, biological, and physical characteristics of the Great Lakes System." (Water Quality Criteria and Standards Newsletter, USEPA, April 1995, EPA-823-N-95-001)

In addition to the scientific applicability of the Great Lakes Initiative to Arizona, it is worth considering the usefulness of implementing the recommended mercury criterion of 180 picograms/L (pg/L) in Arizona: A 180 pg/L (0.00018 µg/L) mercury standard is 67 times more stringent than Arizona's most stringent mercury standard (0.012 µg/L - chronic standard for A&Wc use) and ca. 2,700 times more stringent than the practical quantitation limit (0.5 µg/L), the lowest level of quantitative measurement that can be reliably achieved during routine laboratory operations as set in Arizona's water quality standards. Consequently, the establishment of a 180 pg/L mercury standard results in a standard 2,700 lower than can be practicably measured. Arizona's geology is such that the natural levels of many elements, including mercury, may be higher than what is naturally found in regions of the United States with different geologies. A 1991 study by the Earth Technology corporation found the average mercury concentration of 47 background soil samples taken throughout Arizona by the US Geological Survey to be 0.1 mg/Kg. Consequently, it is probable that in some parts of Arizona 180 pg/L of mercury in water is below natural background levels. Given what is stated above, ADEQ does not believe that the application of the GLWQI recommendations for mercury is either scientifically defensible or practical for protecting water quality in Arizona.

ADEQ disagrees that the tissue levels of mercury found in Peña Blanca and Arivaca Lakes are evidence of the need for the development of a more stringent water quality standard. While fish taken from both Peña Blanca and Arivaca Lakes contained concentrations of mercury above both the US Fish and Wildlife Service and US Food and Drug Administration action

levels (0.1 and 1.0 mg/Kg respectively) these levels do not indicate an inadequate water quality standard. A concurrent water sample taken from Peña Blanca did not contain detectable levels of mercury and the sediment sample had a mercury concentration 60 times lower than the residential Human Health Based Guidance Level for the consumption of soil. Neither lake receives NPDES discharges which could be regulated by a more stringent water quality standard. Both lakes, however, are affected by nonpoint source runoff from long abandoned mines on public lands. A standard set at a level that is impossible to measure in a practical manner would have no impact on this mercury source. Instead, efforts should be directed to find solutions to minimize nonpoint source runoff from abandoned mines and manage the fishery in Pena Blanca Lake in a way that minimizes the risk to human health.

149. Comment: The City of Phoenix appreciates the state's efforts at updating specific water quality standards as new information becomes available. New information indicating that arsenic in animal tissue occurs in the relatively nontoxic organic form, resulting in a more realistic arsenic standard for the Salt River, will avoid large unnecessary costs and diversion of resources in attempting to solve a problem that does not exist.

Response: EPA has established a new human health screening value for arsenic in fish tissue that considers only the inorganic fraction of arsenic, rather than total arsenic. This change in how arsenic is considered is due to the probability that organic arsenic is an order of magnitude less toxic and teratogenic than the inorganic form. The new human health screening value also does not consider a carcinogenic endpoint in its calculation.

Currently, ADEQ calculates the fish consumption standard on the basis of its classification as a carcinogen. Because EPA is publishing new information that changes the classification of arsenic from a carcinogen to a non-carcinogen, ADEQ appropriately changed the method of calculation of the fish consumption standard. Explicit in the EPA decision to classify arsenic as a non-carcinogen is the fact that arsenic in tissue is at least 90% comprised of organic arsenic. This fact coupled with the low assumed consumption rate for fish tissue [6.5 g/D] and the strong probability of a non-linear dose response curve, having a low slope at low dose [where most of the dose is methylated] and a high slope at high dose [where methylation capacity is saturated] favors a change in the methodology for calculating an arsenic criterion.

Because there is a possibility of some inorganic arsenic in fish tissue, ADEQ calculated the the new fish consumption criterion according to the following equation:

$$SV = ([Rfd \times BW] \div [CR \times BCF]) \times 0.9$$

The 0.9 factor is a margin of safety / uncertainty factor that allows for the possibility of some inorganic arsenic in fish tissue. However, regardless of the value of this uncertainty factor, the change in status for arsenic from a carcinogen to a non-carcinogen results in such a high fish consumption criterion that the water quality criteria for arsenic for both the domestic water source and full body contact designated uses are more stringent.

Appendix B. List of Surface Waters and Designated Uses

150. Comment: Colony Wash and Cereus Wash should be reclassified as ephemeral waters to which the standards for A&We and PBC be applicable. Both washes are ephemeral streams or dry arroyos that for part of their distance flow through Fountain Hills, Arizona.

Response: ADEQ agrees. A review of available groundwater data indicates that these water bodies should be classified as ephemeral waters. The corresponding appropriate designated uses are A&We and PBC.

151. Comment: The City of Tucson has concern that 3 washes appear to have been arbitrarily listed, as they are tributary to listed waters. These are: Alamo Wash [tributary to Rillito Wash]; Atterbury Wash [tributary to Pantano Wash]; and Julian Wash [tributary to the Santa Cruz River]. Because these washes are tributary to listed waters, and therefore share the same use designations, it is unnecessary and redundant to list them separately. The City of Tucson requests that these washes be removed from listing in Appendix B.

Response: ADEQ disagrees. ADEQ listed these water bodies in Appendix B with A&We and PBC designated uses during the last triennial review of water quality standards. These surface water were listed on the basis of written request from the Pima Association of Governments (dated November 30, 1990). ADEQ researched this request and found that each of these ephemeral waters meets the definition of a surface water. Consequently, each was added to Appendix B. For ADEQ to remove these water bodies from Appendix B, it would be necessary to demonstrate that these surface waters are not "surface waters" or "waters of the United States" that are subject to protection under the Clean Water Act (CWA). Because these surface waters are ephemeral waters and thus covered under the CWA these waters will continue to be listed in Appendix B.

152. Comment: The City of Tucson is concerned about the use of the term, "urban lakes," in Appendix B. The only ponds listed in Appendix B as "urban lakes" are in Tucson. What is the intent and meaning of this nomenclature. All of the waters listed in Appendix B as Tucson "urban lakes" would cease to exist if they were not artificially filled from either Tucson's reclaimed water system, potable water system or well. These urban lakes fail to meet the definition for "surface water." The following lakes and their sources are provided for your information: 1) Kennedy Lake [groundwater], 2) Lakeside Lake [reclaimed water], 3) Reid Park Lake [reclaimed water, serves as a forebay to irrigation system], 4) Silverbell Lake [recovery well], and 5) Fort Lowell Lake [Fort Lowell swimming pool].

Each of the lakes listed above is subject to use as a forebay for park irrigation systems with the exception of Fort Lowell Lake. With the next extension of Tucson's reclaimed water system, Kennedy Park Lake will receive reclaimed water. 65% of Tucson's reclaimed water is recharged and recovered at the Sweetwater Recharge and Recovery Facility. The balance is

treated and filtered at Tucson's Reclaimed Water Treatment Plant. All of the water served to the reclaimed water system meets open access irrigation standards and is regulated under the reuse rules. Tucson believes that the reuse regulations are sufficiently stringent to eliminate these lakes from consideration as surface waters.

Response: In the last triennial review of the water quality standards, ADEQ found that Kennedy Lake and Lakeside Lake were "surface waters" or "waters of the United States" because they are located in washes that are surface waters, but that Silverbell Lake was not a "surface water" because it was not originally created in what would otherwise be considered a surface water [See Concise Explanatory Statement (CES) from the 1992 triennial review, p. 242]. It was too late in the last triennial review to list Kennedy Lake and Lakeside Lake in Appendix B of the water quality standards.

A review of this statement in the 1992 CES does show that Kennedy Lake and Lakeside Lake are built in washes and meet the definition of a surface water that requires protection under the Clean Water Act. Silverbell Lake and Reid Lake result from excavations and were not originally constructed in what would otherwise be considered a "surface water." Because fishing activities are encouraged in both of these lakes (Silverbell Lake is part of State Urban Fishing Program; Reid Lake is stocked by the City of Tucson), a broad interpretation of the definition of a surface water could result in these lakes being considered surface waters and regulated under the Clean Water Act. However, both lakes have reuse permits and it is possible to regulate water quality to protect human health [See A.A.C.R18-9-703(A)]. Fort Lowell Lake is not built in a surface water, nor is it used for recreational activity. As a result of the above analysis, ADEQ will list Kennedy Lake and Lakeside Lake in Appendix B, but not list Silverbell Lake, Reid Lake and Fort Lowell Lake.

The term "urban lake" was used as a description to recognize that these lakes are found within the urban environment. However, it would be more correct to use the term "municipal park lake" to link these water bodies with the maintenance rule found at A.A.C. R18-11-117. These types of lakes were recognized in the 1992 triennial review and ADEQ made a decision to apply FC, A&Ww and PBC uses to them. The FC use recognizes that these lakes are part of urban fishing programs and the PBC use recognizes that these lakes are not used for swimming. In addition to the lakes referenced in Tucson, a number of these lakes also have been established in the Phoenix area. The Phoenix area lakes, although given specific locations in Appendix B, are likewise not identified as municipal park lakes. To be consistent throughout all the water quality standards all urban lakes will be identified in Appendix B as "municipal park lakes" and given specific location descriptions. The following modifications have been made to the Tucson municipal park lakes listed in Appendix B: Kennedy Lake - Mission Road & Ajo Road, Tucson; Lakeside Lake - 8300 East Stella Road, Tucson; Agua Caliente Lake - 12325 East Roger Road, Tucson.

153. Comment: Because of its location within Atterbury Wash, Lakeside Park Lake represents a unique case. Lakeside Lake was constructed within the wash for the purpose of stormwater detention and is equipped with a sedimentation basin that serves to improve stormwater quality. It is a "wet" stormwater detention basin, with a permanent pool maintained by reclaimed water, which is subject to reuse permit standards. As a detention basin, Lakeside Park only temporarily detains stormwater and should not be subject to more restrictive standards [A&Ww] than the ephemeral wash in which it is positioned. The City of Tucson believes that water quality within Lakeside Park Lake is best regulated under the reuse program. The City therefore requests that ADEQ reconsider the listing of Lakeside Park Lake as an urban lake, leave it regulated as a tributary with the A&We designation and remove the partial body contact and fish consumption designated uses.

    Response: The location of Lakeside Park Lake in Atterbury Wash requires its classification as a "surface water" or a "water of the United States." The definition of "surface water" includes all impoundments of waters that are otherwise defined as "surface waters." The definition of "surface water" also includes all intrastate lakes which are used or could be used by interstate or foreign travelers for recreational or other purposes. The fact that Lakeside Park Lake also may function as a "wet" stormwater detention basin does not change the fact that the lake meets these definitional criteria.

154. Comment: The discharge from the Mt. Lemmon Wastewater Treatment Plant should be included as an effluent dependent water. The authorized discharge site is described in the NPDES permit as "unnamed washes, tributary to Alder Wash, tributary to the San Pedro River."

    Response: ADEQ agrees in part. A review of the NPDES permit for this facility shows that the discharge is to an unnamed wash that is tributary to Alder Wash. Accordingly, this EDW will be listed in R18-11-113 and Appendix B as: Unnamed Wash (Mt Lemmon WWTP to 0.25 km downstream). The designated uses are A&Wedw & PBC.

155. Comment: The Arizona Game & Fish Department supports inclusion of Kennedy, Lakeside and Silverbell Lakes in the Santa Cruz basin in Appendix B. Inclusion of these lakes will improve our ability to manage and maintain these important resources under our Urban Fishing Program. Game and Fish manages this popular program under an interagency agreement with the City of Tucson. Biweekly fish stockings under this program are dependent on adequate water quality conditions.

    Response: ADEQ will list Kennedy Lake and Lakeside Lake in Appendix B of the surface water quality standards rules because they result from impoundments of a surface water. Silverbell Lake has been removed because (1) it is not built in a surface water, and (2) it is regulated under the wastewater reuse rules.

156. Comment: [9 letters from private citizens] Lakeside Park Lake should be listed in Appendix B and subject to water quality standards.

    Response: The Department has listed Lakeside Lake in Appendix B because it clearly meets the definition of a "surface water" that is subject to water quality standards. That is, Lakeside Lake is an impoundment of a water that is defined as a "surface water" under R18-11-101(40)(d).

157. Comment: A stretch of Pinal Creek, downstream of the Cyprus Miami mine, from Setka Ranch to the Salt River has been designated as having the use of agricultural irrigation [AgI]. To our knowledge, water from this segment is not used for the irrigation of crops. Cyprus Miami requests that ADEQ remove the agricultural irrigation designated use along this section of Pinal Creek.

    Response: The AgI designated use has been listed for this portion of Pinal Creek for some time and little information exists as to why it was 1st listed as a designated use. Information from the Setka family and the U.S. Geological Survey indicates that farming may have occurred in the 1940s and 1950s, but that the use has not occurred for many years. Therefore, ADEQ removed the AgI designated use from Pinal Creek, Setka Ranch to the Salt River.

158. Comment: Pima County personnel have investigated the use designation for the Tanque Verde Creek in the Tucson area and have found that a large portion of the creek should not have the current desigation of A&Ww. Field investigation has led Pima County personnel to believe that the creek should only have conservatively the A&Ww designation from the headwaters down to Wentworth Road, and the rest of the reach from Wentworth Road down to the confluence with Tanque Verde Creek should be designated A&We, PBC and AgL. We request that this portion of the Tanque Verde Creek be redesignated to reflect this.

    Response: Based on information from ADEQ staff and groundwater maps, ADEQ concurs with this comment. The listing for Tanque Verde Creek has been changed in Appendix B.

159. Comment: The Agua Caliente Wash is incorrectly designated. The A&Ww designation on this wash may be attributable to the same current designation on the Tanque Verde Creek of which it is tributary. Agua Caliente Wash should be redesignated A&We, PBC and AgL to relect the accurate condition of this wash.

    Response: ADEQ agrees in part. Information gathered from ADEQ and Pima County staff show that Agua Caliente Wash is ephemeral in its lower portion outside of the Coronado National Forest. However, evidence exists of permanent flow in the reaches located above the Coronado National Forest boundary. ADEQ has modified the Appendix B listing for Agua Caliente Wash to the following: Agua Caliente Wash, Headwaters to Coronado National Forest boundary, A&Ww, FBC, FC, AgL; Agua Caliente Wash, below Coronado National Forest boundary, A&We, PBC & AgL.

160. Comment: What was the rationale for the addition of the AgL designated use on the Santa Cruz River?

    Response: Information provided to ADEQ since the adoption of the 1992 water quality standards was used as a basis for adding the AgL to 2 segments of the Santa Cruz River: Nogales WWTP to Tubac; Roger Road WWTP to Baumgartner Road. Information was provided that the river was used for livestock watering, especially in the Nogales to Tubac segment. It was assumed that this use was likely also occurring in the Roger Road WWTP to Baumgartner Rd. segment as well. However, in response to the comment, ADEQ staff have investigated further to find that it is unlikely that the AgL designated use is occurring in the latter segment. This finding is based on (1) the reach is located in an area dominated by urban surroundings and farming, and (2) no records of downstream water rights exist for anyone using the effluent for the purpose of livestock watering. As a result of this research, the Department is retaining the AgL use for the Santa Cruz River, Nogales International WWTP outfall to the Tubac Bridge, and removing the use from the Santa Cruz River, Roger Road WWTP outfall to Baumgartner Road.

161. Comment: The Town of Patagonia objects to the designation of Sonoita Creek from the headwaters to the Patagonia WWTP outfall as aquatic and wildlife [warm water fishery]. The correct designation should be aquatic and wildlife [ephemeral]. The Town of Patagonia recently submitted extensive documentation of the ephemeral nature of Sonoita Creek above its WWTP outfall as part of its nutrient waiver application. The evidence submitted by the town shows that this stream segment does not support a self-sustaining fish population. Therefore, imposition of a fish consumption standard is inappropriate. In addition, because this stream segment is ephemeral, imposition of the partial body contact standard also is inappropriate.

Response: There are 3 components to the definition of an ephemeral water as defined at A.A.C. R18-11-101(22): (1) a channel that is at all times above the water table, (2) a channel that flows only in direct response to precipitation, and (3) a channel that does not support a self-sustaining fish population. An investigation of Sonoita Creek and a review of available groundwater data indicate that the portion of Sonoita Creek from the headwaters to 1 kilometer downstream of the State Route 82 bridge crossing qualifies as an ephemeral stream. However, at ca. 1 kilometer downstream of the State Route 82 bridge the flow in Sonoita Creek becomes intermittent. During a recent field investigation the following site conditions were found:

About 35 to 40 yards upstream of where Pennsylvania Avenue crosses Sonoita Creek surface flow is present. Upstream of this point, for 1/4 to 1/3 of a mile, surface flow was continuously present. Aquatic vegetation included watercress, duckweed, horsetail and several different types of green algae. A healthy riparian corridor is present with varying age classes. The invertebrate community in flowing areas included Veliidae, Gerridae, Chironomidae, Simuliidae, and snails. Amphibian egg masses were observed as well.

Several indicators were found that this portion of Sonoita Creek is not ephemeral but intermittent: (1) ADEQ records from previous monitoring activities on Sonoita Creek indicate that flow is variable, i.e., sometimes the site does dry up; (2) in order to have healthy riparian vegetation, water must be either at or close to the surface at all times; (3) water must be present at the surface for long enough periods (at least several weeks at a time) to allow the development of the aquatic vegetation; and (4) the types of biological organisms present are typical of intermittent waters. These findings taken together indicate that beginning ca. 1 kilometer below State Route 82 Sonoita Creek is no longer ephemeral but intermittent. Naturally intermittent streams are designated as either A&Ww or A&Wc.

With regards to the application of the PBC designated use, federal regulations require that all water bodies have an established recreational use, either Full Body Contact (swimming) or PBC (incidental contact). Because FBC is only attainable in ephemeral waterbodies during flood events, water bodies with A&We as a designated use have PBC as the recognized recreational designated use.

Appendix B has been modified to show that Sonoita Creek, from the headwaters to 1 kilometer downstream of State Route 82, is an ephemeral water with the designated uses of A&We and PBC. From 1 kilometer downstream of State Route 82 to the Town of Patagonia WWTP outfall, the stream has aquatic and wildlife [warm water fishery] [A&Ww], full body contact [FBC], fish consumption [FC] and the agricultural livestock watering [AgL] designated uses.

162. Comment: Sonoita Creek, below the Town of Patagonia, should not be designated as Aquatic & Wildlife [warmwater fishery], but should be redesignated as Aquatic & Wildlife [effluent dependent water].

Response: An effluent-dependent water (EDW) is defined as a surface water that consists primarily of discharges of treated wastewater (A.A.C. R18-11-101 (21). Consequently, for Sonoita Creek, below Town of Patagonia, to be designated as an effluent dependent water (EDW), more than 50% of the total discharge of the creek must consist of treated wastewater.

Information gathered from staff, department files and data submitted by the Town of Patagonia shows that the portion of Sonoita Creek for a distance of 750 feet downstream of the WWTP outfall qualifies as effluent-dependent, i.e., more than 50% of the flow consists of treated wastewater. ADEQ has modified Appendix B and R18-11-113 to reflect this designation. Sonoita Creek, from the Town of Patagonia WWTP outfall to 750 feet downstream of the outfall is classified as an effluent dependent water with the A&Wedw, PBC and AgL designated uses. Below 750 feet downstream of the Town of Patagonia WWTP outfall, the designated uses are A&Ww, FBC, FC and AgL.

163. Comment: What is the rationale for the designated uses on Nogales Wash?

Response: Appendix B list the designated uses for Nogales Wash as A&Ww, PBC, AgI & AgL. ADEQ has received information that the agricultural uses are inappropriate, primarily because the urban surroundings provide no opportunity for agricultural activity. Also a field investigation showed that the FC use is also not occurring, i.e., there are no consumable aquatic organisms present. The final rule reflects these findings, listing A&Ww and PBC as the only uses occurring in the wash. While researching the appropriate uses for Nogales Wash, it was determined that Nogales Wash is not directly tributary to the Santa Cruz River as Appendix B currently lists, but is instead a tributary of Potrero Creek. Potrero Creek is directly tributary to the Santa Cruz River. The following changes have been made to Appendix to clarify this finding: (1) the location description for Nogales Wash has been changed to "Tributary to Potrero Creek", and (2) Potrero Creek has been added to Appendix B with the following designated uses: Potrero Creek, headwaters to Interstate 19, A&We, PBC, AgL; and Potrero Creek, below Interstate 19, A&Ww, FBC, FC, AgL.

164. Comment: The Central Arizona Water Conservation District is pleased that the Central Arizona Project aqueduct is not included in the list of canals to which water quality standards apply. CAWCD continues to believe that it is inappropriate to apply water quality standards to the CAP aqueduct system.

Response: The Central Arizona Project canal is not listed as a surface water in the currently effective water quality standards rules. ADEQ did not propose any changes to the currently listed canal systems in this triennial review.

165. Comment: The application of fish consumption standards to canal systems like the CAP is inappropriate. The entire Central Arizona Project system is fenced in a concerted effort to keep people and wildlife out of the canal system. It is estimated that at least $20 million has been spent on fencing the Central Arizona Project system. A "proximity access system" has been installed to restrict access to authorized operations and maintenance personnel. Gates throughout the system remain locked at all times, except for access by authorized personnel. Signs have been placed throughout the length of the CAP system stating that trespassing, swimming and fishing are strictly prohibited. The estimated cost of signage for the CAP system is $50,000 to $100,000.

Response: ADEQ did not propose any changes to the designated uses of canals that are listed in Appendix B. The Central Arizona Project canal is not listed in Appendix B. Currently, no canal systems have the fish consumption designated use.

166. Comment: The constructed water conveyances provision of the Clean Water Act Reauthorization bill passed by the U.S. House of Representatives expressly allows a state that adopts or reviews water quality standards for constructed water conveyance systems to exempt such systems from aquatic life or fish consumption designated uses if such uses are not reasonably foreseeable or interfere with the intended purposes of the system. H.R. 961, which is now being considered by the United States Senate, unequivocally defers questions of water quality standards for constructed water conveyance systems like the CAP to the states. CAWCD commends ADEQ for deciding not to include the CAP system within its definition of "surface waters."

Response: ADEQ did not change any listings or designated uses of canals in this triennial review. ADEQ hopes that issues related to constructed water conveyances will be addressed during Clean Water Act reauthorization.

167. Comment: Adding fish consumption as a designated use for the Salt River segment from the I-10 bridge to the 23rd Avenue WWTP discharge is troubling. If, in fact, the EPA disapproval is a valid reason for this change, then the process, rationale, and reason for designating this stream segment as a warm water fishery in the 1st place is suspect and should be reviewed.

There are a myriad of stormwater returns along this stretch of the Salt River which will require a substantial investment of public funds to comply with the fish consumption standards without any demonstrable benefits in water quality or in any ben-

efits to the "fishery." It is especially disheartening to note that the economic impact statement dismisses this future eventuality with the statement that "[i]t is unclear how many NPDES-permitted facilities will be affected by these revisions." This statement, while accurate, is misleading since draft NPDES permits have been issued and the administrative process for finalizing these draft permits is proceeding.

Response: See response to following comment.

168. Comment: The only reason ADEQ proposes to add the fish consumption [FC] designated use to the Salt River from the I-10 bridge to the 23rd Avenue WWTP is because EPA demanded the change when it disapproved the last revision of the water quality standards that did not include that use. In regard to this stream segment, the EPA action appears to be arbitrary and capricious. ADEQ action does not and should not lend legitimacy to this determination. This use designation would impose extreme costs on the public because of the many stormwater outfalls that discharge to this river segment.

ADEQ could write a use attainability analysis to justify not including the FC designed use on this river segment but has chosen not to do so. The City is aware of no evidence that harvesting fish and shellfish for food is a significant activity on that stretch of the river, and ADEQ apparently has no complete data on the types of edible fish or shellfish, if any, that are caught and eaten from that river segment.

The stretch of the river is almost entirely dry throughout the year and should be classified as an ephemeral water. One known water source for this river segment is the Tempe Drain, which discharges seasonal and small amounts of stormwater and agricultural drainage. This water is not of sufficient quantity and duration to sustain independent populations of edible fish. ADEQ should collect more data on the effect of the Tempe Drain and its potential use for fishing. With the advent of new regulations prohibiting dry weather flows through storm drains, the flow from the Tempe Drain may diminish even further.

The other water sources are groundwater accumulations in sand and gravel pits located on private property. Since these pits are managed as private pits for mining operations, it is unreasonable to treat them as a natural river. We understand that the sand and gravel companies operate the pits in a way that would periodically kill any fish or shellfish in them. Thus, these pits are not likely to be sources of self-sustaining populations of edible aquatic life. Anyone who fishes in these pits may be trespassing and illegal fishing should not be a basis of the FC use. The City is not aware of any empirical evidence of significant human consumption of fish caught in these groundwater ponds.

For further factual analysis as to why the FC use is inappropriate for this river segment, the City hereby incorporates by reference the ADEQ Use Attainability Analysis for the fish consumption designated use for effluent dominated waters dated July 20, 1995. At the very least, ADEQ should apply the FC use to only those limited portions of the "river" where the ponds are located.

EPA rules and guidance allow the State to determine whether any fishing that may occur in this stretch of the Salt River is important enough to warrant protection. For example, the EPA document entitled, "EPA Guidance for State Implementation of Water Quality Standards (December 12, 1988) contains the following recommendation: "When fish ingestion is considered an important activity, then the human health related water quality criteria recommendation developed under §304(a) of the CWA should be used...." Note the qualifier that allows a determination as to whether fish consumption is important enough to warrant designation of the FC use. No EPA guidance document requires ADEQ to adopt th FC use for only incidental and sporadic harvesting of fish.

EPA has on several occasions emphasized that the state may consider economic and social impacts caused by a use designation. State law requires this consideration. The State also has a duty to accurately characterize the unique circumstances affecting a water body. EPA has stated that "[c]onsideration of the suitability of the water body to attain a use is an integral part of the water quality standards review and revision process."

ADEQ's economic analysis for the proposed rules did not consider the social and economic impact of the rule on stormwater discharges. ADEQ instead requested data on economic impacts from the public. The City cannot provide this data in the short time allotted for comments on the proposed rule. ADEQ should collect economic data before a rule is proposed, not afterwards. ADEQ had prior knowledge of the pending issuance of the NPDES permit to the City for municipal stormwater, and had access to stormwater monitoring data, and also knew that the City would question the propriety of the FC use for this segment of the Salt River as it would affect that permit.

Response: The EPA disapproval, dated September 9, 1993, stated that to be in compliance with §101(a)(2) of the CWA and 40 CFR 131.10(a), the State may either designate the FC use for all water bodies listed in Appendix B of the state water quality standards or provide use-attainability analyses to justify the omission of that use.

In response to that disapproval ADEQ stated on July 6, 1994 that it would (1) add the FC use to all water bodies with the A&Wc or A&Ww designated uses and (2) conduct appropriate UAAs for effluent-dependent and ephemeral water bodies to justify the omission of FC on any of these water bodies. The underlying assumption of this approach is that if a water body is capable of supporting a cold or warmwater aquatic organisms, then consumption of these organisms is also possible. Because the Salt River, I-10 bridge to 23rd Avenue bridge, has an A&Ww designated use, the approach to resolving the EPA disapproval results in the addition of the FC use on this portion of the Salt River.

The placement of the A&Ww use on this portion of the Salt River resulted from information received from the AZ Game & Fish department (letter dated September 20, 1990) during the previous triennial review (rules adopted January 10, 1992). A biological survey of aquatic wildlife species undertaken at 7th Avenue and the Salt River and I-10 and the Salt River resulted in the collection of the following aquatic taxa: Guppy, mosquitofish, goldfish, threadfin shad, tilapia, sailfin molly, tadpole,

crayfish, redear sunfish, green sunfish, frogs and carp. AGFD believes that these aquatic taxa continue to live along this portion of the Salt River (phone conversation with AGFD, February 28, 1996). Consequently, the Department believes that the A&Ww designated use is justified.

To justify not placing FC on this portion of the Salt River requires a UAA. In that UAA it will be necessary to document that in fact FC is not an existing use. While this would be an obvious conclusion for the portions of this part of the river that are routinely dry, it would not be a simple and may not be an appropriate conclusion for the generally perennial pools that are intermittently dispersed throughout this stretch. For example, during an investigation (February 23, 1996) of potential surface water contamination resulting from runoff from water sprayed on a nearby fire, ADEQ staff saw numerous fish in a pool extending from Central Avenue to 7th Street and found a carp hooked on an unattended fishing line with a bobber. Based on this finding, it is likely that FC is an appropriate use for the portions of the riverbed that have these pools. Through the UAA process it may be possible to re-segment this portion of the Salt River into segments with and without A&Ww and FC. However, if the segments are too short it will be difficult to demonstrate that re-designations are protective of downstream uses.

The FC designated use only potentially impacts storm water discharges (there are no other permitted point source discharges to this segment of the river). The drafts of the 1st cycle of storm water permits that affect this portion of the river do not have chemical-specific monitoring requirements to demonstrate compliance with water quality standards, and consequently the impact of the addition of the FC designation will not affect the implementation of these storm water permits. Moreover, these storm water permits will be effective 5 years until 2001. In the interim the state will be required to complete another triennial review of the water quality standards rules. Considering (1) the above time frames, (2) the nature of the currently drafted storm water permits, (3) the likelihood that FC is an existing use of parts of this portion of the Salt River, and (4) the potential complexity of the UAA that will be required to justify omitting the FC designated use, the Department believes that at this time it is appropriate to apply the FC designated use and review the designation during the next triennial review.

169. Comment: We oppose the proposed deletion from Appendix B of all waters located on tribal lands. The Act requires adoption of water quality standards for all waters of the United States within the state, and this includes waters within tribal lands. Although the state's jurisdiction on tribal lands is limited, state standards for such waters can serve important purposes, particularly where the tribe has not adopted water quality standards of its own. For example, such standards can be important in setting limits for discharges from areas outside that reservation that will or may reach reservation waters. State standards can also be important in guiding actions by EPA and other federal agencies with respect to activities on tribal lands that impact on surface water quality. Further, tribes can consent to the exercise of jurisdiction by the state in specific cases. There may also be instances in which the state does have jurisdiction over pollutant discharges by non-Indians within a reservation, where such discharges reach waters outside the reservation. For all the foregoing reasons, ADEQ should withdraw the proposal to delete from Appendix B waters that are located on tribal lands.

Response: The removal of surface waters on tribal lands that are listed in Appendix B of Arizona's water quality standards does not affect the application of Clean Water Act (CWA) requirements on the protection those waters. The February 4, 1987 Amendments to the Act require EPA to promulgate regulations specifying how EPA will treat qualified Indian Tribes as states for the purpose of, among other things, the water quality standards program. Final regulations were published in 56 FR 64893, December 12, 1991. For tribes to qualify they must be federally recognized, carry out substantial governmental duties, have appropriate authority to regulate the quality of reservation waters, and be reasonably expected to be capable of administering water quality programs.

In addition to federal rules governing the development of water quality standards by tribes, EPA also has adopted an Indian Policy which in practice "is to work directly with Tribal governments as independent authorities for reservation affairs, recognizing that they are not political subdivisions of States." (57 FR 8523, March 10, 1992).

ADEQ has adopted a tribal government policy that likewise recognizes the authority of tribal governments to manage their own affairs: "The ADEQ recognizes the sovereignty of tribal governments and their jurisdiction over lands within Indian country as defined by federal law. ADEQ will not assert authority over Indian country." (ADEQ Policy, February 4, 1994).

As stated above, the removal of listed tribal waters from Appendix B does not change the application of the Clean Water Act on these waters. This statement is based on the following: (1) The EPA has stated that in the interim between the time a tribe begins pursuing state status under the Clean Water Act and the time it adopts water quality standards, its policy will be to use previously developed state standards: "Were EPA to simply ignore previously developed state standards in the interim period before tribes develop their own standards, there would be a regulatory void which EPA believes would not be beneficial to reservation water quality" (56 FR 64891, Dec. 12, 1991); (2) Because no Arizona tribes have EPA-approved water quality standards, EPA Region IX uses the state water quality standards for determining effluent limitations. Removal of tribal lands from Appendix B will not change this permitting approach: "Should EPA find it necessary to promulgate federal standards for a tribe...(e.g., where necessary to address needed water quality-based permit actions), EPA re-asserts its belief that the standards of the adjacent state will be a logical beginning step for EPA if for no other reason than the consistency required by 40 CFR 131.10(b)" (56 FR 64891, December 12, 1991); and (3) If the EPA finds a need that is not met by state water quality standards, then "the EPA will give serious consideration to Federal promulgation of water quality standards on Indian lands" (56 FR 64891, December 12, 1991).

To date, no tribes in Arizona have qualified for state status for the purpose of administering water quality programs. However, several tribes, i.e., Navajo, Hopi, and White Mountain Apache, have submitted draft proposals to EPA and are already actively working with EPA on developing tribal water quality standards. ADEQ is also aware that at least 2 other Tribes, San Carlos Apache and the Gila Indian River Community, likewise plan to develop their own water quality standards programs.

In the interest of supporting the Department's policy of recognizing the right of tribes in Arizona to exercise jurisdiction over their own lands, and because many tribes are making a sincere effort to develop their own water quality standards, ADEQ believes that it is appropriate to remove tribal waters listed in Appendix B from the State's water quality standards.

170. Comment: In its April 29, 1994 decision on the state's last triennial review, EPA indicated that it had received documentation from the U.S. Fish & Wildlife Service and the Arizona Game and Fish Department that aquatic life and subsistence fishing occurs on some canals in the state. EPA further indicated that it had received assurances that ADEQ would revisit use designations for canals in the next triennial review, and that EPA expected "that the state will provide EPA with a revised list of navigable waters and use designations [Appendix B] in the next triennial review of standards that will reflect appropriate uses for canals to include "aquatic life and wildlife" and "fish consumption" where these uses occur." ADEQ has not complied with this requirement. As a result, canals that qualify as waters of the United States are not adequately protected by the state's standards.

Response: The commenter is correct that EPA approved the designated uses for canals listed in Appendix B in the last triennial review. Based upon assurances provided by ADEQ, EPA stated in its approval that EPA expected that the state would revisit the issue of which canals are "waters of the United States" in this triennial review and establish appropriate use designations for those canals that are "waters of the United States." EPA noted that it had received documentation from the U.S. Fish & Wildlife Service and the Arizona Game & Fish Department that aquatic life and subsistence fishing occurs on some canals in Arizona. EPA stated that where such uses exist in canals that are "waters of the United States," the water quality standards should include aquatic and wildlife and fish consumption designated uses.

ADEQ revisited the canal issues in this triennial review. ADEQ held a series of roundtable discussions in 1995 that were dedicated to discussing issues related to water quality standards and canals. In the course of those discussions, a number of fundamental legal questions arose regarding the applicability of the Clean Water Act to canals which the state was unable to resolve. Consequently, ADEQ has maintained the status quo with regard to the listing of canals and their designated uses.

The most fundamental question considered was whether canals are "waters of the United States" that are subject to Clean Water Act jurisdiction? It is possible to interpret the term, "waters of the United States," to include canals. The current state and federal definitions of "waters of the United States" are very broad. The legislative history of the Clean Water Act and the case law interpreting the meaning of "waters of the United States" supports giving the term its broadest possible constitutional interpretation. While neither the state or federal definitions of "waters of the United States" specifically include canals as an example, it is possible to argue that a canal is a "water...the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce...." On the other hand, it also is possible to argue that the definition of "waters of the United States" was never intended to apply to canal systems. All of the specific examples that are included in the definition of "waters of the United States" are natural water bodies. It may be argued that this reveals an intent not to regulate artificial water bodies like canals as "waters of the United States." Participants in the canal roundtable discussions were sharply divided over whether canal systems were "waters of the United States" or not. ADEQ acknowledges that there is considerable legal uncertainty in this regard and that, despite the specific listing of some canals in the currently effective rules, the scope of the jurisdiction of the Clean Water Act with respect to canals is unclear.

A 2nd important question was whether the "fishable / swimmable" goals of the Clean Water Act apply to canals? If canals are "waters of the United States," then under federal and state law, water quality standards must be established for canals which protect the public health and welfare, enhance the quality of the water, and serve the purposes of the Clean Water Act. Federal water quality standards regulations interpret the phrase, "serve the purposes of the Act," as meaning that the water quality standards should support the primary objectives of the Act [i.e., the interim goal of water quality that waters of the United States be "fishable / swimmable"]. In practical terms, this means that water quality standards for canals must provide, wherever attainable, water quality for the protection of fish, shellfish, and wildlife and recreation in and on the water. If canals are "waters of the United States," federal water quality standards regulations require that the state to establish water quality standards that maintain water quality in canals for full body contact recreation [FBC], fish consumption [FC] and the protection of aquatic life and wildlife [A&W] or conduct use attainability analyses to justify the omission of such water quality standards.

Participants in the canal roundtable discussion legitimately questioned whether the "fishable / swimmable" goals of the Clean Water Act are appropriate water quality goals for canals. For example, should canals have full body contact recreation standards when swimming is prohibited because of the danger of drowning? Should canals be required to maintain water quality which supports aquatic life when the design, flow regimes, physical characteristics, operation and maintenance of canals do not support A&W designated uses? Should water quality in canals be maintained at levels which protect persons who may consume fish taken from canals when fishing is prohibited and only an incidental use? Moreover, what if such designated uses actually interfere with the intended use of the canal system for water transport?

A 3rd important issue relates to interstate and intrastate equity. Only a limited number of canal systems in Arizona are listed in the currently effective water quality standards rules [There are only 4 canals or canal systems listed in Appendix B]. ADEQ cannot explain the rationale for the original listing of only 4 canal systems. It appears from the listing themselves that 3 of the 4 canal systems were listed originally to establish water quality standards for the maintenance and protection of water quality for use as a domestic water source. It is unknown whether the state ever considered the fundamental question of whether canals were "waters of the United States" when the canals were originally listed. A 4th canal, the Arlington Canal, apparently was listed on the basis of an EPA Regional Counsel decision which held that the Arlington canal was a "water of the United States." The point was made in the last triennial review and in the roundtable discussions that if canals are "waters of the United States," then shouldn't all canals in Arizona be listed and regulated under the water quality standards rules? Argu-

ably, all canals [even small laterals and ditches] have the requisite nexus with interstate or foreign commerce to be considered "waters of the United States." It is difficult to justify the selective listing of a small group of Arizona canals.

Also, there is a significant interstate equity issue with regard to canals. There does not appear to be a consistent EPA position as to whether canals are "waters of the United States" or not. It appears that states are being treated unequally depending on what EPA region a state is in. For example, in the West, only EPA Region IX has made the regulation of water quality in canals under the Clean Water Act an issue. EPA Regions VI and VIII have not made canals an issue for the water quality standards programs in their respective states. In fact, the State of Colorado, has enacted a state law which specifically exempts canals from the jurisdiction of the Clean Water Act. One may legitimately ask why EPA Region VIII did not find this exemption to be inconsistent with the Clean Water Act if canals are "waters of the United States."

In the canal roundtable discussions, ADEQ considered a number of regulatory options, including:

1. Regulation of water quality in canals as "waters of the United States;"
2. State regulation of water quality in canals as "waters of the state" and protection of water quality in canals for intended uses;
3. Exemption of all or some canals from water quality standards; and
4. Maintenance of the status quo.

Because of the many unanwered questions regarding the regulation of water quality in canals, ADEQ chose to maintain the status quo in this triennial review. ADEQ is aware that there are efforts in Congress to specifically address canal issues in the Clean Water Act. For example, H.R. 2567 was introduced in the 1st Session of the 104th Congress to amend the Clean Water Act as it related to water quality standards for constructed water conveyances. H.R.2567, as amended, specifically provides that "[i]f a State adopts or reviews water quality standards for constructed water conveyances, it shall not be required to establish recreational, aquatic life, or fish consumption uses for such systems if the uses are not existing or reasonably foreseeable or such uses interfere with the intended purpose of the conveyance system." ADEQ will maintain the status quo with regard to the canal systems that are currently listed in the water quality standards rules. Hopefully, the Congress will reauthorize the Clean

Water Act before the next triennial review and provide clearer guidance with regard to how water quality in canals should be regulated under the Clean Water Act.

Appendix C. Practical Quantitation Limits

171. Comment: ASARCO disagrees with the proposal to remove the PQL table from the water quality standards rules for inclusion in an enforcement guidance document as requested by EPA. Under the current water quality standards, the PQLs are used to determine compliance with numeric water quality standards that have been set near or below the limit of detection for a given pollutant and test method. Because the PQLs are used to determine compliance with numeric water quality standards, ASARCO believes that their use meets the definition of a rule under the Administrative Procedures Act. As such, the PQLs should be established through the rulemaking process. If reissued as guidance, the PQLs would fall under the definition of a substantive policy statement which is only advisory in nature. As a result, the PQLs would not be enforceable by the Department, could easily be challenged in a court of law, could be inconsistently applied by ADEQ personnel and could be changed at any time without public comment. ASARCO believes that it is critical to maintain the current listing of PQLs in the surface water quality standards.

Response: ADEQ disagrees. Practical quantitation limits are not default water quality standards which must be adopted by rule. Nor are the practical quantitation limits independently enforceable. It is the water quality standards that are enforceable. The purpose of R18-11-120(B) is to provide notice to the regulated community as to how ADEQ will enforce a violation of a water quality standard that is established at a concentration that is below levels of reliable detection and quantification. The rule provides an important notice function to the regulated community regarding how ADEQ will exercise its enforcement discretion. It is the water quality standards that are enforceable, not the PQLs. While the exercise of ADEQ's enforcement discretion may be challenged in court, ADEQ is confident that an enforcement action to prosecute a violation of a water quality standard that is initiated when the ambient concentration exceeds the PQL would withstand such challenge. The development of a guidance document which includes relevant PQLs provides adequate notice to the regulated community and will result in a more consistent ADEQ enforcement policy.

Stormwater

172. Comment: ASARCO continues to support the development of stormwater-specific water quality standards. ADEQ should develop stormwater-specific water quality standards applicable to both municipalities and industries and take into consideration the unique hydrological and water quality conditions that are created by storm events in the arid Southwest. Specifically, ADEQ should develop: 1) stormwater- specific turbidity standards; 2) "1st flush" standards; 3) stormwater-specific pH and temperature standards; and 4) stormwater-specific standards for hardness dependent metals.

Response: ADEQ supports the development of stormwater-specific water quality standards. However, there is no data to support the establishment of scientifically defensible standards in this triennial review.

173. Comment: The current water quality standards do not account for the unique conditions that are created by stormwater runoff, especially stormwater runoff into ephemeral drainages. These unique conditions, as recognized by the U.S. Congress in

H.R. 961, require that separate and appropriate criteria and standards be developed for stormwater runoff. In the interim, ADEQ should clarify that discharges of stormwater are exempt both from narrative and numeric water quality standards.

Response: ADEQ agrees that stormwater specific standards should be developed for Arizona surface waters. ADEQ disagrees that in the interim period while such standards are being developed that stormwater discharges may be exempted from compliance with narrative and numeric water quality standards. A blanket exemption from compliance with water quality standards for the class of stormwater discharges would be inconsistent with the Clean Water Act.

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:
Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12 [revised as of October 1, 1994] in R18-11-112(D)(2)(a).

List of Highly Safeguarded Protected Native Plants in Arizona, Arizona Administrative Code, Title 3, Chapter 6, Appendix A, subsection (A) [December 20, 1994] in

R18-11-112(D)(2)(c).

Federally Listed Threatened and Endangered Species of Arizona, U.S. Fish & Wildlife Service [June 6, 1995] in R18-11-112(D)(2)(d).

13. Was this rule previously adopted as an emergency rule?
No.

14. The full text of the rules follows:

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 11. DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY ~~BOUNDARIES AND~~ STANDARDS

ARTICLE 1. WATER QUALITY STANDARDS FOR ~~NAVIGABLE~~ SURFACE WATERS

Section
R18-11-101. Definitions
R18-11-102. Applicability
R18-11-103. ~~Exclusions~~ Reserved
R18-11-104. Designated Uses
R18-11-105. Tributary
R18-11-106. Net Ecological Benefit
R18-11-107. Antidegradation
R18-11-108. Narrative Water Quality Standards
R18-11-109. Numeric Water Quality Standards
R18-11-110. Salinity of the Colorado River
R18-11-111. Analytical Methods
R18-11-112. Unique Waters
R18-11-113. Effluent ~~dominated~~ Dependent waters
R18-11-114. Mixing Zones
R18-11-115. Nutrient Waivers
R18-11-116. Resource Management Agencies
R18-11-117. Canals and Municipal Park Lakes
R18-11-118. Dams and Flood Control Structures
R18-11-119. Natural Background
R18-11-120. Enforcement
R18-11-121. Schedules of Compliance
R18-11-122. Variances
R18-11-123. Prohibition Against Discharge; Sabino Creek
App. A Numeric water quality criteria
App. B List of ~~navigable~~ Surface Waters and Designated Uses
App. C Practical quantitation limits

ARTICLE 2. ~~DISCHARGE LIMITATIONS~~

~~R18-11-202. Discharge limitations for phosphates~~
~~R18-11-203. Prohibitions on discharge~~
~~R18-11-204. Repealed~~
~~R18-11-205. Discharges to ephemeral waters~~

ARTICLE 1.WATER QUALITY STANDARDS FOR ~~NAVIGABLE~~ SURFACE WATERS

R18-11-101. Definitions
~~In addition to the definitions prescribed in A.R.S. §§ 49-101 and 49-201, the~~ The terms of ~~Article 1 and~~ Article 2 this Article shall have the following meanings:

1. "Acute toxicity" means toxicity involving a stimulus severe enough to rapidly induce a response. In aquatic toxicity tests, an effect observed in 96 hours or less is considered acute.
2. "AgI" means agricultural irrigation.
3. "AgL" means agricultural livestock watering.
4. "Agricultural irrigation" means the use of a ~~navigable~~ surface water for the irrigation of crops.
5. "Agricultural livestock watering" means the use of a ~~navigable~~ surface water as a supply of water for consumption by livestock.
6. "Annual mean" means the arithmetic mean of monthly values determined over a consecutive 12-month period, provided that monthly values are determined for at least 3 months. The monthly value ~~shall be~~ is the arithmetic mean of all values determined in a calendar month.
7. "Aquatic and wildlife (cold water fishery)" means the use of a ~~navigable~~ surface water by animals, plants, or other organisms, including salmonids, for habitation, growth, or propagation.
8. "Aquatic and wildlife (effluent ~~dominated~~ dependent water)" means the use of an effluent ~~dominated~~ dependent water by animals, plants, or other organisms for habitation, growth, or propagation.
9. "Aquatic and wildlife (ephemeral)" means the use of an ephemeral water by animals, plants, or other organisms, excluding fish, for habitation, growth, or propagation.
10. "Aquatic and wildlife (warm water fishery)" means the use of a ~~navigable~~ surface water by animals, plants, or other organisms, excluding salmonids, for habitation,

growth, or propagation.

11. "A&Wc" means aquatic and wildlife (cold water fishery).
12. "A&We" means aquatic and wildlife (ephemeral).
13. "A&Wedw" means aquatic and wildlife (effluent ~~dominated~~ dependent water).
14. "A&Ww" means aquatic and wildlife (warm water fishery).
15. "Clean Water Act" means the Federal Water Pollution Control Act, as amended by the Water Quality Act of 1987 ~~(and no future amendments), which is incorporated by reference and on file with the Office of the Secretary of State and the Department~~.
16. "Criteria" means elements of water quality standards that are expressed as pollutant concentrations, levels, or narrative statements representing a water quality that supports a designated use.
17. "Designated use" means a use specified in Appendix B of this Article for a ~~navigable~~ surface water.
18. "Domestic water source" means the use of a ~~navigable~~ surface water as a potable water supply. Coagulation, sedimentation, filtration, disinfection, or other treatments may be necessary to yield a finished water suitable for human consumption.
19. "DWS" means domestic water source.
20. "EDW" means effluent ~~dominated~~ dependent water.
21. "Effluent ~~dominated~~ dependent water" means a ~~navigable~~ surface water that consists primarily of discharges of treated wastewater ~~and that~~ which has been classified as an effluent ~~dominated~~ dependent water by the Director ~~pursuant to A.A.C.~~ under R18-11-113.
22. "Ephemeral water" means a ~~navigable~~ 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.
23. "Existing use" means a use that ~~is actually attained~~ has actually occurred in a ~~navigable~~ surface water on or after November 28, 1975 or a use that the existing water quality of a ~~navigable~~ surface water will allow.
24. "FBC" means full body contact.
25. "FC" means fish consumption.
26. "Fish consumption" means the use of a ~~navigable~~ surface water by humans for harvesting aquatic organisms for consumption. Harvestable aquatic organisms include, but are not limited to, fish, clams, turtles, crayfish, and frogs.
27. "Full body contact" means the use of a ~~navigable~~ surface water which causes the human body to come into direct contact with the water to the point of complete submergence. The use is such that ingestion of the water is likely to occur and certain sensitive body organs, such as the eyes, ears, or nose may be exposed to direct contact with the water.
28. "Geometric mean" means the nth root of the product of n items or values. The geometric mean is calculated using the following formula:

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

29. "Hardness" means the sum of the calcium and magnesium concentrations, expressed as calcium carbonate ($CaCO_3$), in milligrams per liter.
30. "Mixing zone" means a prescribed area or volume of a ~~navigable~~ surface water that is contiguous to a point source discharge where initial dilution of ~~a~~ the discharge takes place.
31. "National Pollutant Discharge Elimination System" means the point source discharge permit program established by §402 of the Clean Water Act.
32. "Navigable waters" means the waters of the United States.
33. ~~33.~~ 32. "Ninetieth percentile" means the value which may not be exceeded by more than 10% of the observations in a consecutive 12 month period. A minimum of 10 samples, each taken at least 10 days apart, are required to determine a ninetieth percentile.
33. "NNS" means no numeric standard.
34. "Oil" means petroleum in any form, including but not limited to crude oil, gasoline, fuel oil, diesel oil, lubricating oil, or sludge.
35. "Partial body contact" means the use of a ~~navigable~~ surface water which may cause the human body to come into direct contact with the water, but normally not to the point of complete submergence. The use is such that ingestion of the water is not likely to occur, nor will sensitive body organs such as the eyes, ears, or nose normally be exposed to direct contact with the water.
36. "PBC" means partial body contact.
37. "Practical quantitation limit" means the lowest level of quantitative measurement that can be reliably achieved during routine laboratory operations.
38. "Recreational uses" means the full-body contact and partial-body contact designated uses.
39. "Regional Administrator" means the Regional Administrator of Region 9 of the Environmental Protection Agency.
40. "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 or foreign 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.
41. ~~40.~~ 41. "Total nitrogen" means the sum of the concentrations of ammonia (NH_3), ammonium ion (NH_4+), nitrite (NO_2-), nitrate (NO_3-), and dissolved and particulate organic nitrogen expressed as elemental nitrogen.
42. ~~41.~~ 42. "Total phosphorus" means all the phosphorus present in the sample, regardless of form, as measured by a persul-

fate digestion procedure.

~~42.~~ 43."Toxic" means those pollutants, or combination of pollutants, which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations in such organisms or their offspring.

~~43.~~ 44."Unique water" means a ~~navigable~~ surface water which has been classified as an outstanding state resource water by the Director ~~pursuant to A.A.C.~~ under R18-11-112.

~~44.~~ 45."Use attainability analysis" means a structured scientific assessment of the factors affecting the attainment of a designated use which may include physical, chemical, biological, and economic factors.

~~45. "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 and ephemeral streams), creeks, washes, draws, mudflats, sandflats, wetlands, sloughs, backwaters, prairie potholes, wet meadows, playa lakes, reservoirs, or natural ponds, 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 or foreign commerce;~~

~~d. All impoundments of waters otherwise defined as waters of the United States under this definition;~~

~~e. Tributaries of waters otherwise defined as waters of the United States under this definition; and~~

~~f. Wetlands adjacent to waters (other than waters that are themselves wetlands) otherwise defined as waters of the United States under this definition.~~

46. "Wetlands" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, cienegas, tinajas, and similar areas.

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

R18-11-102. Applicability

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

B. The water quality standards prescribed in this Article do not apply to the following:

1. Waste treatment systems, including impoundments, ponds, lagoons, and constructed wetlands that are a part of such waste treatment systems.

2. Man-made surface impoundments and associated ditches and conveyances used in the extraction, beneficiation, and processing of metallic ores, including pits, pregnant leach solution ponds, raffinate ponds, tailing impoundments, decant ponds, concentrate or tailing thickeners, blowdown water ponds, ponds and sumps in mine pits associated with dewatering activity, ponds holding water that has come in contact with process or product and that is being held for recycling, spill or upset catchment ponds, or ponds used for on-site remediation that are not surface waters or are located in areas that once were surface waters but no longer remain surface waters because they have been and remain legally converted.

R18-11-103. ~~Exclusions~~ Reserved

~~The water quality standards prescribed in this Article do not apply to:~~

~~1. Waste treatment systems, including ponds, lagoons and constructed wetlands that are a part of such waste treatment systems. This exclusion applies only to manmade bodies of water which neither are originally created in a navigable water nor result from the impoundment of a navigable water.~~

~~2. Man-made surface impoundments and associated ditches and conveyances used in the extraction, beneficiation and processing of metallic ores, including pregnant leach solution ponds, raffinate ponds, tailing impoundments, decant ponds, concentrate or tailing thickeners, blowdown water ponds, ponds and sumps in mine pits associated with dewatering activity, ponds holding water that has come in contact with process or product and that is being held for recycling, spill or upset catchment ponds or ponds used for on-site remediation provided that any discharge from any such surface impoundment to a navigable water is permitted under the National Pollutant Discharge Elimination System program.~~

R18-11-104. Designated Uses

A. The Director shall adopt or remove designated uses and subcategories of designated uses by rule.

B. Designated uses of ~~navigable waters~~ a surface water may include full body contact, partial body contact, domestic water source, fish consumption, aquatic and wildlife (cold water fishery), aquatic and wildlife (warm water fishery), aquatic and wildlife (ephemeral), aquatic and wildlife (effluent ~~dominated~~ dependent water), agricultural irrigation, and agricultural livestock watering. ~~Designated~~ The designated uses for specific ~~navigable~~ surface waters are listed in Appendix B of this Article.

C. Numeric water quality criteria to protect the designated uses are prescribed in Appendix A, R18-11-109, R18-11-110, and R18-11-112. Narrative standards to protect all ~~navigable~~ surface waters are prescribed in R18-11-108.

D. A navigable water that is not listed in Appendix B but that is tributary to a listed navigable water shall be protected by the water quality standards that have been established for the nearest downstream navigable water listed in Appendix B that is not an effluent dominated water. Where the nearest downstream listed water is an ephemeral water, the A&We and PBC standards shall apply only to that portion of the tributary that is an ephemeral water. The A&Ww and FBC standards shall apply to that portion of the tributary that is not an ephemeral water.

~~E.~~ D. If a ~~navigable~~ surface water has more than 1 designated use listed in Appendix B, ~~the applicable water quality criterion for a pollutant is the most stringent of those prescribed to protect the designated uses of the navigable water~~ then the most strin-

gent water quality criterion applies.

~~F.~~ E. The Director shall revise the designated uses of a ~~navigable~~ surface water if water quality improvements result in a level of water quality which permits a use that is not currently listed as a designated use in Appendix B.

~~G.~~ F. In designating uses of a ~~navigable~~ surface water and in establishing water quality criteria to protect those designated uses, the Director shall take into consideration the applicable water quality standards for downstream ~~navigable~~ surface waters and shall ensure that the water quality standards that are established for an upstream surface water also provide for the attainment and maintenance of the water quality standards of downstream ~~navigable~~ surface waters.

~~H.~~ G. A use attainability analysis shall be conducted prior to removal of a designated use or adoption of a subcategory of a designated use that requires less stringent water quality criteria.

~~I.~~ H. The Director may remove a designated use or adopt a subcategory of a designated use that requires less stringent water quality criteria, provided the designated use is not an existing use and it is demonstratedthrough a use attainability analysis that attaining the designated use is not feasible for any of the following reasons:

1. Naturally occurring pollutant concentrations prevent the attainment of the use;
2. Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use~~, unless these conditions may be compensated for by the discharge of a sufficient volume of treated wastewater without violating water conservation or other applicable requirements. Nothing herein shall be construed to require releases of treated wastewater~~;
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 ~~navigable~~ surface water to its original condition or to operate such modification in a way that would result in attainment of the use; ~~Nothing herein shall be construed to require the releases of water from dams;~~
5. Physical conditions related to the natural features of the ~~navigable~~ surface water, 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.

R18-11-105. Tributary

The following water quality standards apply to a surface water that is not listed in Appendix B but that is a tributary to a listed surface water:

1. For an unlisted tributary that is an ephemeral water, the aquatic and wildlife [ephemeral] and partial-body contact standards apply.
2. For an unlisted tributary that is an effluent dependent water, the aquatic and wildlife [effluent dependent water] standards and partial-body contact standards apply.
3. For an unlisted tributary that is not an ephemeral water or an effluent dependent water and which has salmonids present, the aquatic and wildlife [cold water fishery] and fish consumption standards apply as well as the water quality standards that have been established for the nearest downstream surface water listed in Appendix B that is not an ephemeral water or an effluent dependent water.
4. For an unlisted tributary that is not an ephemeral water or an effluent dependent water and which does not have salmonids present, the aquatic and wildlife [warm water fishery] and fish consumption standards apply as well as the water quality standards which have been established for the nearest downstream surface water listed in Appendix B that is not an ephemeral water or effluent dependent water.

R18-11-106. Net Ecological Benefit

A. The Director may, by rule, modify a water quality standard on the ground that there is a net ecological benefit associated with the discharge of effluent to support or create a riparian and aquatic habitat in an area where such water resources are limited. The Director may modify a water quality standard for a pollutant if it is demonstrated that:
   1. The discharge of effluent creates or supports an ecologically valuable aquatic, wetland, or riparian ecosystem in an area where such resources are limited.
   2. The ecological benefits associated with the discharge of effluent under a modified water quality standard exceed the environmental costs associated with the elimination of the discharge of effluent.
   3. The cost of treatment to achieve compliance with a water quality standard is so high that it is more cost effective to eliminate the discharge of effluent to the surface water. The discharger shall demonstrate that it is feasible to eliminate the discharge of effluent which creates or supports the ecologically valuable aquatic, wetland, or riparian ecosystem and that a plan to eliminate the discharge is under active consideration.
   4. The discharge of effluent to the surface water will not cause or contribute to a violation of a water quality standard that has been established for a downstream surface water.
   5. All practicable point source discharge control programs, including local pretreatment, waste minimization, and source reduction programs, are implemented; and
   6. The discharge of effluent does not produce or contribute to the concentration of a pollutant in the tissues of aquatic organisms or wildlife that is likely to be harmful to humans or wildlife through food chain concentration.

B. The Director shall not modify a water quality criterion for a pollutant to be less stringent than a technology-based effluent limitation which applies to the discharge of that effluent. The discharge of effluent which creates or supports and ecologically valuable aquatic, riparian, or wetland ecosystem shall, at a minimum, comply with applicable technology-based effluent limitations.

R18-11-107. Antidegradation

A. ~~The determination of whether there is any degradation of water quality in a navigable water shall be~~ The Department shall determine whether there is any degradation of water quality in a surface water on a pollutant by pollutant basis.

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

C. Tier 2: Where existing water quality in a ~~navigable~~ surface water is better than the applicable water quality ~~standards~~ standard, the existing water quality shall be maintained and protected. The Director may allow limited degradation of

existing water quality in ~~such navigable waters, except unique waters,~~ the surface water, provided that the Department has held a public hearing on whether degradation should be allowed pursuant to the general public hearing procedures prescribed at R18-1-401 and R18-1-402 and the Director makes all of the following findings:

1. The level of water quality necessary to protect existing uses is fully protected.
2. The highest statutory and regulatory requirements for all new and existing point sources as set forth in the Clean Water Act are achieved.
3. All cost-effective and reasonable best management practices for nonpoint source control are implemented.
4. Allowing lower water quality is necessary to accommodate important economic or social development in the area in which the ~~navigable~~ surface water is located.

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

E. ~~Nothing in this Section or in the implementation of this Section shall be inconsistent~~ The Department shall implement this Section in a manner consistent with §316 of the Clean Water Act where a potential water quality impairment associated with a thermal discharge is involved.

R18-11-108. Narrative water quality standards

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

1. Settle to form bottom deposits that inhibit or prohibit the habitation, growth, or propagation of aquatic life or that impair recreational uses;
2. Cause objectionable odor in the area in which the ~~navigable~~ surface water is located;
3. Cause off-taste or odor in drinking water;
4. Cause off-flavor in aquatic organisms or waterfowl;
5. Are toxic to humans, animals, plants, or other organisms;
6. Cause the growth of algae or aquatic plants that inhibit or prohibit the habitation, growth, or propagation of other aquatic life or that impair recreational uses;
7. Cause or contribute to a violation of an aquifer water quality standard prescribed in ~~A.A.C.~~ R18-11-405 or ~~A.A.C.~~ R18-11-406; or
8. Change the color of the ~~navigable~~ surface water from natural background levels of color.

B. ~~Navigable waters~~ A surface water shall be free from oil, grease, and other pollutants that 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 watercraft shall not be considered a violation of this narrative standard.

R18-11-109. Numeric Water Quality Standards

A. The water quality standards prescribed in this Section and in Appendix A apply to ~~navigable~~ surface waters listed in Appendix B and their tributaries. Additional numeric water quality standards for unique waters are prescribed in R18-11-112.

B. The following water quality standards for fecal coliform, expressed in colony forming units per 100 milliliters of water (cfu/100 ml), shall not be exceeded:

1. Fecal Coliform	~~FBC~~	DWS, PBC, A&W[1], AgI, AgL
30-day geometric mean (5 sample minimum)	~~200~~	1000
10% if samples for a 30-day period	~~400~~	2000
Single sample maximum	~~800~~	4000
2. Fecal Coliform in effluent ~~dominated~~ dependent waters		All designated areas
30-day geometric mean (5 sample minimum)		200
10% if samples for a 30-day period		400
Single sample maximum		800

C. 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
30-day geometric mean (5 sample minimum)	130
Single sample maximum	580

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

pH	DWS	FBC,PBC,A&W[2]	AgI	AgL
Maximum	9.0	9.0	9.0	9.0
Minimum	5.0	6.5	4.5	6.5
Maximum change due to discharge	NNS	0.5	NNS	NNS

~~D.~~ E. The following maximum allowable increase in ambient water temperature, expressed in degrees Celsius, shall not be exceeded:

Temperature[3]	A&Ww,A&Wedw	A&Wc
Maximum increase due to a discharge[~~4,5~~ 3,4]	3.0	1.0

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

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

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

1. Dissolved oxygen[6]	A&Ww	A&Wc	~~A&Wedw~~
Single sample minimum[~~7,8~~ 5]	6.0	7.0	~~1.0~~

2. Dissolved oxygen in effluent dependent waters [single sample minimum]:	A&Wedw
3 hours after sunrise to sunset	3.0
Sunset to 3 hours after sunrise	1.0

3. If the dissolved oxygen (mg/L) of a surface water is less

than the water quality standard for dissolved oxygen, but the percent saturation of oxygen is equal to or greater than 90%, then the surface water shall be deemed to be in compliance with the water quality standard for dissolved oxygen.

~~G.~~H. The following water quality standards for total phosphorus and total nitrogen, expressed in milligrams per liter (mg/L), shall not be exceeded:

	Annual mean	90th percentile	Single Sample Maximum
1. Verde River and its tributaries from headwaters to Bartlett Lake:			
Total phosphorus	0.10	0.30	1.00
Total nitrogen	1.00	1.50	3.00
2. ~~White River,~~ Black River, Tonto Creek, and their tributaries that are not located on tribal lands:			
Total phosphorus	0.10	0.20	0.80
Total nitrogen	0.50	1.00	2.00
3. Salt River and its tributaries, except Pinal Creek, ~~from the confluence of the White and Black Rivers to~~ above Theodore Roosevelt Lake that are not located on tribal lands:			
Total phosphorus	0.12	0.30	1.00
Total nitrogen	0.60	1.20	2.00
4. Theodore Roosevelt, Apache, Canyon, and Saguaro Lakes:			
Total phosphorus	0.03[a]	NNS	0.60[b]
Total nitrogen	0.30[a]	NNS	1.00[b]
5. Salt River below Stewart Mountain Dam to confluence with the Verde River:			
Total phosphorus	0.05	NNS	0.20
Total nitrogen	0.60	NNS	3.00
6. Little Colorado River and its tributaries above River Reservoir in Greer; South Fork of Little Colorado River above South Fork Campground; Water Canyon Creek above Apache-Sitgreaves National Forest boundary:			
Total phosphorus	0.08	0.10	0.75
Total nitrogen	0.60	0.75	1.10
7. Little Colorado River at crossing of Apache County Road No. 124			
Total phosphorus	NNS	NNS	0.75
Total nitrogen	NNS	NNS	1.80
8. Little Colorado River above Lyman Lake to above Amity Ditch diversion near crossing of Arizona Highway 273 (applies only when in-stream turbidity is less than 50 NTU):			
Total phosphorus	0.20	0.30	0.75
Total nitrogen	0.70	1.20	1.50
9. Colorado River, at Northern International Boundary near Morelos Dam:			
Total phosphorus	NNS	0.33	NNS
Total nitrogen	NNS	2.50	NNS
10. San Pedro River, from Curtiss to Benson:			
Total phosphorus	NNS	NNS	NNS
Total nitrate as N	NNS	NNS	10.00

11. The discharge of wastewater to Show Low Creek and tributaries upstream of and including Fools Hollow Lake shall not exceed 0.16 mg/l total phosphates as P.
12. The discharge of wastewater to the San Francisco River and tributaries upstream of Luna Lake Dam shall not exceed 1.0 mg/l total phosphates as P.

~~H.~~ I. The following water quality standards for radiochemicals shall not be exceeded:

1. In all ~~navigable~~ surface waters, the concentration of radiochemicals shall not exceed the limits established by the Arizona Radiation Regulatory Agency in ~~Title 12, Chapter 1~~ 12 A.A.C 1, Article 4, Appendix A, Table II, Column 2 ~~of the Arizona Administrative Code~~, (effective June 30, 1977 and no future amendments), which is incorporated by reference and on file with the Office of the Secretary of State and with the Department.
2. In ~~navigable~~ surface waters that are designated as domestic water sources, the following water quality standards for radiochemicals shall not be exceeded:
   a. The concentration of gross alpha particle activity, including radium-226 but excluding radon and uranium, shall not exceed 15 picocuries per liter of water.
   b. The concentration of combined radium-226 and radium-228 shall not exceed 5 picocuries per liter of water.
   c. The concentration of strontium-90 shall not exceed 8 picocuries per liter of water.
   d. The concentration of tritium shall not exceed 20,000 picocuries per liter of water.
   e. The average annual concentration of beta particle activity and photon emitters from man-made radionuclides shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirems per year.

Footnotes:

1 Includes A&Wc, A&Ww and A&We.

2 Includes A&Wc, A&Ww, A&Wedw and A&We.

~~3~~ ~~There is no water quality standard for temperature for the A&We designated use.~~

~~4~~3 Does not apply to Cholla Lake.

~~5~~4 Does not apply to a wastewater treatment plant discharge to a dry watercourse that creates an effluent ~~dominated~~ dependent water.

~~6~~ ~~There is no dissolved oxygen standard for the A&We designated use.~~

~~7~~ ~~Or 90% saturation, whichever is less. If the dissolved oxygen (mg/L) of the waterbody is less than the the water quality standard, but the percent saturation of oxygen is equal to or greater than 90%, then the waterbody is in compliance with the dissolved oxygen water quality standard~~

~~8~~5 The dissolved oxygen water quality standard for a lake shall apply below the surface but not at a depth greater than 1 meter.

a means annual mean of representative composite samples taken from the surface and at 2 and 5 meter depths.

b means maximum for any set of representative composite samples taken from the surface and at 2 and 5 meter depths.

"NNS" means no numeric standard.

R18-11-111. Analytical Methods

A. ~~Analysis of a sample taken to determine compliance with a water quality standard shall be in accordance with an approved analytical method prescribed in Title 9, Chapter 14 Article 6 of the Arizona Administrative Code~~ A person conducting an analysis of a sample taken to determine compliance with a water quality standard shall use an approved analytical method prescribed in 9 A.A.C. 14, Article 6, or an alternative analytical method that is approved by the Director of the Department of Health Services ~~pursuant to A.A.C. R9-14-607.B.~~ under R9-14-607(B).

B. A test result from a sample taken to determine compliance with a water quality standard ~~shall be~~ is valid only if the sample has been analyzed by a laboratory that is licensed by the Arizona Department of Health Services for the analysis per-

formed.

R18-11-112. Unique Waters

A. ~~The classification of a navigable water as a unique water shall be by rule~~ The Director shall use rulemaking to classify a surface water as a unique water.

B. The Director may adopt, by rule, site-specific water quality standards to maintain and protect existing water quality in a unique water.

C. Any person may nominate a ~~navigable~~ surface water for classification as a unique water by filing a petition for rule adoption with the Department. A petition for rule adoption to classify a ~~navigable~~ surface water as a unique water shall include:
1. A map and a description of the ~~navigable~~ surface water;
2. A written statement in support of the nomination, including specific reference to the applicable criteria for unique waters classification as prescribed in subsection (D) of this Section;
3. Supporting evidence demonstrating that 1 or more of the applicable unique waters criteria prescribed in subsection (D) of this Section has been met; and
4. ~~Relevant water quality data.~~ Available water quality data relevant to establishing baseline water quality of the proposed unique water.

D. ~~A navigable water may be classified as a unique water by the Director upon a finding.~~ The Director may classify a surface water as a unique water upon finding that the ~~navigable~~ surface water is an outstanding state resource water based upon 1 of the following criteria:
1. The ~~navigable~~ 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 the wilderness characteristics of the ~~navigable~~ surface water.
2. Threatened or endangered species are known to be associated with the ~~navigable~~ surface water and the existing water quality is essential to the maintenance and propagation of a threatened or endangered species or the ~~navigable~~ surface water provides critical habitat for a threatened or endangered species. Endangered or threatened species are identified on the following lists which are hereby incorporated by reference and on file with the Office of the Secretary of State and with the Department:
   a. Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12 (revised as of ~~July 12, 1995~~ October 1, 1994);
   b. "Threatened Native Wildlife of Arizona," Arizona Game and Fish Department (July 21, 1988);
   c. ~~List of protected groups of plants prescribed in A.A.C. R3-1-615 and A.A.C. R3-1-616 (January 17, 1989)~~ List of highly safeguarded protected native plants in 3 A.A.C. 4, Article 6, Appendix A(A) (December 20, 1994);
   ~~d. List of Migratory Birds, 50 CFR 10.13 (April 5, 1985);~~
   ~~e.~~d. ~~"Endangered and Threatened~~ Federally Listed Threatened and Endangered Species of Arizona," U.S. Fish & Wildlife Service (~~Summer 1991~~ June 6, 1995).

E. The following ~~navigable~~ surface waters are classified as unique waters:
1. The West Fork of the Little Colorado River, above Government Springs;
2. Oak Creek, including the West Fork of Oak Creek;
3. ~~People's~~ Peeples Canyon Creek, tributary to Santa Maria River;
4. Burro Creek, above its confluence with Boulder Creek;
5. Francis Creek, Mohave and Yavapai counties;
6. Bonita Creek, tributary to the upper Gila River;
7. Cienega Creek, from I-10 bridge to Del Lago Dam, Pima County;
8. Aravaipa Creek, from confluence of Stowe Gulch to the downstream boundary of the Aravaipa Canyon Wilderness Area;
9. Cave Creek and South Fork of Cave Creek [Chiricahua Mountains], from headwaters to the Coronado National Forest boundary; and
10. Buehman Canyon Creek, from headwaters [Lat. 32°24'55.5" N, Long. 110°39'43.5" W] to approximately 9.8 miles downstream [Lat. 32°24'31.5" N, Long. 110°32'08" W].

F. The following water quality standards apply to the listed unique waters. Water quality standards prescribed in this subsection supplement ~~or supersede~~ the water quality standards prescribed pursuant to R18-11-109.
1. The West Fork of the Little Colorado River, above Government Springs:

Parameter	Standard
Fecal Coliform[a]	200 cfu/ 100 ml (single sample maximum)
pH (standard units)[b]	no change due to discharge
Temperature[b]	no increase due to discharge
Dissolved oxygen [b]	no decrease due to discharge
Total dissolved solids [b]	no increase due to discharge
Chromium (as Cr)(D) [a]	10 µg/L
~~Zinc (D)[a]~~	~~110 µg/L~~

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

Parameter	Standard
~~Fecal coliform[a]~~	~~150 cfu/100 ml*~~
pH (standard units) [b]	no change due to discharge
Nitrogen (T) [a]	1.00 mg/L (annual mean) 1.50 mg/L (90th percentile) 2.50 mg/L (single sample max.
Phosphorus (T) [a]	0.10 mg/L (annual mean) 0.25 mg/L (90th percentile) 0.30 mg/L (single sample max.)
~~Zinc (D) [a]~~	~~50 µg/L~~
~~Turbidity change due to discharge [b]~~	~~3 NTU~~

~~* Geometric mean of a random set of a minimum of 10 samples in any calendar month.~~

3. ~~People's~~ Peeples Canyon Creek, tributary to Santa Maria River:

Parameter	Standard
Temperature [b]	no increase due to discharge
Dissolved oxygen [b]	no decrease due to discharge
Turbidity change due to discharge [b]	5 NTU
Arsenic (T)[b]	20 µg/L
Manganese (T) [a]	500 µg/L

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

~~Parameter~~	~~Standard~~
~~Fecal coliform[a]~~	~~500 cfu/100 ml(single sample maximum)~~
Manganese (T) [a]	500 µg/L

5. Francis Creek, Mohave and Yavapai Counties:

Parameter	Standard
~~Fecal coliform[a]~~	~~500 cfu/ 100 ml (single sample maximum)~~
~~Manganese (T) [a]~~	~~500 µg/L~~

6. Cienega Creek, from I-10 bridge to Del Lago Dam, Pima County:

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

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

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

Abbreviations:

(D) means dissolved fraction

(T) means total recoverable

NTU means nephelometric turbidity unit

mg/L means milligrams per liter

µg/L means micrograms per liter

cfu/ml means colony forming units per milliliter

[a] means that the numeric water quality standard supersedes a water quality standard prescribed in R18-11-109 or Appendix A.

[b] means that the numeric water quality standard supplements the water quality standards prescribed in R18-11-109 and Appendix A.

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

A. ~~The classification of a navigable water as an effluent dominated water shall be by rule~~ The Director shall use rulemaking to classify a surface water as an effluent dependent water.

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

C. Any person may submit a petition for rule adoption requesting that the Director classify a ~~navigable~~ surface water as an effluent ~~dominated~~ dependent water. The petition for rule adoption shall include:
1. A map and a description of the ~~navigable~~ surface water.
2. Information that demonstrates that the ~~navigable~~ surface water consists primarily of discharges of treated wastewater.

D. The following ~~navigable~~ surface waters are classified as effluent ~~dominated~~ dependent waters:
1. In the Colorado River Main Stem Basin:
   a. Bright Angel Wash from South Rim Grand Canyon ~~wastewater treatment plant (WWTP)~~ WWTP outfall to confluence with ~~Cataract Creek~~ Coconino Wash.
   b. Cataract Creek from Williams WWTP outfall to ~~3 kilometers~~ 1 kilometer downstream from the outfall.
   c. Holy Moses Wash from Kingman WWTP outfall to ~~5~~ 3 kilometers downstream from the outfall.
   d. ~~Unnamed wash, tributary to Bright Angel Creek, from Grand Canyon North Rim WWTP~~ Transept Canyon from North Rim Grand Canyon WWTP outfall to 1 kilometer downstream ~~from the outfall~~.
2. In the Little Colorado River Basin:
   ~~a. Black Creek from Ft. Defiance WWTP outfall to the confluence with Rio Puerco River.~~
   ~~b.~~a. Dry Lake.
   ~~c.~~b. Lake Humphreys.
   ~~d.~~c. Lower Walnut Canyon Lake.
   ~~e.~~d. Ned Lake.
   ~~f.~~ e. Pintail Lake.
   f. Telephone Lake
   g. Rio de Flag from City of Flagstaff WWTP outfall to confluence with ~~Little Colorado River~~ San Francisco Wash.
   h. ~~Telephone Lake.~~ Whale Lake.
3. In the Middle Gila River Basin:
   a. ~~Agua Fria River from Surprise WWTP outfall to 5 kilometers downstream from the outfall.~~ Unnamed wash from the Town of Prescott Valley WWTP outfall to the confluence with the Agua Fria River, and the Agua Fria River below the confluence with the unnamed wash receiving treated wastewater from the Prescott Valley WWTP to State Route 169.
   b. Agua Fria River from El Mirage WWTP outfall to ~~8~~ 2 kilometers downstream from the outfall.
   ~~c. Agua Fria River from Avondale WWTP outfall to confluence with the Gila River.~~
   ~~d. Agua Fria River (Below confluence with unnamed wash receiving treated wastewater from Prescott Valley WWTP to State Route 169.~~
   ~~e. Unnamed wash (From Town of Prescott Valley WWTP outfall to confluence with Agua Fria River).~~
   ~~f.~~ c. Gila River from Florence WWTP outfall to ~~5 kilometers downstream from the outfall~~ Felix Road.
   ~~g.~~ d. Gila River from confluence with the Salt River to Gillespie Dam.
   ~~h.~~e. Queen Creek from Superior ~~WWTP~~ Mining Division discharge outfall to ~~8 kilometers downstream from the outfall~~ confluence with Potts Canyon.
   ~~i.~~ f. Unnamed wash from Gila Bend WWTP outfall to confluence with Gila River.
   ~~j.~~ g. Unnamed wash from Luke AFB WWTP outfall to the confluence with Agua Fria River.
   ~~k.~~ h. Unnamed wash from Queen Valley WWTP outfall to ~~3 kilometers downstream from the~~ confluence with Queen Creek.
4. In the ~~Rio Yaqui~~ Rios de Mexico Basin:
   a. Mule Gulch, from Bisbee WWTP outfall to confluence with Whitewater Draw.
   b. Unnamed wash from Bisbee-Douglas International Airport WWTP outfall to Whitewater Draw.
5. In the Salt River Basin:
   a. ~~Pinal Creek from Globe WWTP outfall to 5 kilometers downstream from the outfall~~ Unnamed wash from Globe WWTP outfall to confluence with Pinal Creek and from confluence of unnamed wash and Pinal Creek to Radium.
   b. Salt River from 23rd Avenue WWTP outfall to confluence with the Gila River.
6. In the San Pedro River Basin:
   a. ~~Unnamed wash from Oracle WWTP outfall to confluence with Big Wash~~ Unnamed wash from Mt. Lemmon WWTP outfall to 0.25 kilometers downstream.
   b. Walnut Gulch from Tombstone WWTP outfall to confluence with ~~the San Pedro River~~ Tombstone Gulch.
7. In the Santa Cruz River Basin:
   ~~a. North Branch of the Santa Cruz Wash from the Casa Grande WWTP outfall to confluence with the Santa Cruz Wash.~~
   ~~b.~~ a. Santa Cruz River from ~~City of Nogales WWTP~~

Nogales International WWTP outfall to ~~Josephine Canyon~~ Tubac Bridge.

~~c.~~ b. Santa Cruz River from Roger Road WWTP outfall to Baumgartner Road crossing.

c. Unnamed wash from Oracle WWTP outfall to 5 kilometers downstream.

d. Sonoita Creek from Town of Patagonia WWTP outfall to 750 feet downstream.

8. In the Upper Gila River Basin:
   a. ~~Bennet~~ Bennett Wash from Arizona ~~Dept.~~ Department of Corrections-Safford WWTP outfall to Gila River.
   b. ~~Cammerman Wash~~ Unnamed wash from Arizona ~~Dept.~~ Department of Corrections-Globe WWTP outfall to ~~3 kilometers downstream from the outfall~~ the boundary of the San Carlos Indian Reservation.
9. In the Verde River Basin:
   a. American Gulch from ~~Payson~~ Northern Gila County Sanitary District WWTP outfall to the East Verde River.
   b. Bitter Creek from Jerome WWTP outfall to 2.5 kilometers downstream from the outfall.
   c. ~~Jack's~~ Jacks Canyon Wash from Big Park WWTP outfall to confluence with Dry Beaver Creek.

E. The NPDES permit issuing authority shall use the water quality standards that apply to an effluent dependent water to derive discharge limitations for a point source discharge from a wastewater treatment plant to an ephemeral water which changes that ephemeral water into an effluent dependent water.

R18-11-114. Mixing Zones

A. The Director may, by order, establish a mixing zone in a ~~navigable~~ surface water. Mixing zones are prohibited in ephemeral waters or where there is no water for dilution.

B. The owner or operator of a point source seeking the establishment of a mixing zone shall submit a mixing zone application to the Department on a standard form that is available from the Department. The application shall include:
1. Identification of the pollutant for which the mixing zone is requested;
2. A proposed outfall design;
3. A definition of the boundary of the proposed mixing zone. For purposes of this subsection, the boundary of a mixing zone means the location where the concentration of treated wastewater across a transect of the ~~navigable~~ surface water differs by less than 5%.
4. A complete and detailed description of the existing physical, biological and chemical conditions of the receiving water and of the predicted impact on such conditions from the proposed mixing zone.
5. Information which demonstrates that there will be no acute toxicity in the proposed mixing zone.

C. The Department shall review the application for a mixing zone to determine whether the application is complete. If the application is incomplete, the Department shall identify in writing the additional information that must be submitted to the Department before the Department can take administrative action on the application for a mixing zone.

D. When the application for a mixing zone is complete, the Department shall make a preliminary determination of whether to establish the mixing zone. The Department shall give public notice and ~~conduct~~ provide an opportunity for a public hearing on whether to establish a mixing zone pursuant to the administrative procedures prescribed in ~~A.A.C.~~ R18-1-401 and R18-1-402.

E. In making the determination of whether to grant or deny the request for the establishment of a mixing zone, the Director shall consider the following factors: sediment deposition, bioaccumulation, bioconcentration, predicted exposure of biota and the likelihood that resident biota will beadversely affected, whether there will be acute toxicity in the mixing zone, the known or predicted safe exposure levels for the pollutant of concern, the likelihood of adverse human health effects, the size of the mixing zone, location of the mixing zone relative to biologically sensitive areas in the ~~navigable~~ surface water, concentration gradient within the mixing zone, the physical habitat, the potential for attraction of aquatic life to the mixing zone, and the cumulative impacts of other mixing zones and other discharges to the ~~navigable~~ surface water.

F. The Director shall deny the request to establish a mixing zone if water quality standards outside the boundaries of the proposed mixing zone will be violated or if concentrations of pollutants within the proposed mixing zone will cause acute toxicity to aquatic life. Denials of applications for a mixing zone shall be in writing and shall state the reasons for the denial. If the Director determines that a mixing zone should be established, he shall issue an order to establish the mixing zone. The Director may include conditions in the order that the Director deems ~~are~~ necessary to protect human health and the designated uses of the ~~navigable~~ surface water. A copy of the Director's decision and order shall be sent by certified mail to the applicant.

G. Any person who is adversely affected by an order of the Director pertaining to a mixing zone may appeal the Director's decision to an administrative law judge pursuant to A.R.S. § 49-321.

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

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

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

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

R18-11-115. Nutrient Waivers

A. ~~The water quality standards for total phosphorus and total nitrogen may be waived~~ The Department may waive the water quality standards for total phosphorus or total nitrogen on a discharger-specific basis for a discharge to an ephemeral water which is tributary to a ~~navigable~~ surface water for which water quality standards for total nitrogen or total phosphorus are prescribed in ~~A.A.C R18-11-109.G~~ R18-11-109(H).

B. A discharger who seeks a nutrient waiver shall submit an application to the Department on a standard form that is available from the Department. The application shall include:
1. Identification of the applicant.
2. Information on the discharging facility, including:
   a. Date the facility was placed in service;
   b. Location of the facility;
   c. Location of the discharge point;
   d. Wastewater treatment method; and
   e. Discharge flow.
3. Information on the receiving ~~navigable~~ surface water, including:
   a. Name of the receiving water;

~~b. Months of the year the receiving water is normally dry;~~

~~c.~~b. Distance in river miles to the nearest downstream ~~navigable~~ surface water ~~with perennial flow~~; and

~~d.~~c. Distance from the point of discharge to the point where the flow goes subsurface during an average dry season.

4. Information which demonstrates that the ~~navigable water~~ nearest downstream surface water is free from pollutants in amounts or combinations which 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.
5. Water quality data, including:
   a. Monthly average, ~~ninetieth~~ 90th percentile and single sample maximum concentrations of total phosphorus and total nitrogen as measured at the point of discharge;
   b. Monthly average, ~~ninetieth~~ 90th percentile and single sample maximum concentrations of total phosphorus and total nitrogen as measured at a downstream control point established by the Department; and
   c. Discharge flow at the time of sampling.

C. The Department shall review the application for completeness and shall notify the applicant in writing whether the application is complete or whether additional information needs to be submitted to the Department.

D. Once an application for a nutrient waiver is complete, the Department shall make a preliminary determination of whether to grant or deny the nutrient waiver. The Department shall issue public notice and ~~conduct~~ provide an opportunity for a public hearing on whether the request for a nutrient waiver should be granted pursuant to procedures prescribed in A.A.C. R18-1-401 and ~~A.A.C.~~ R18-1-402.

E. The Director may, by order, grant a nutrient waiver provided the discharge will not cause a violation of a water quality standard for total phosphorus or total nitrogen in any downstream, ~~perennial navigable~~ surface water or cause a violation of narrative standards prescribed in R18-11-108. A copy of the Director's decision and order shall be sent by certified mail to the applicant.

F. Any person who is adversely affected by an order granting or denying a nutrient waiver may appeal the decision to an administrative law judge pursuant to A.R.S. § 49-321.

G. A nutrient waiver ~~shall be for~~ expires after a fixed term not to exceed 5 years. ~~A nutrient waiver shall be reevaluated~~ The Department shall reevaluate a nutrient waiver upon issuance, reissuance, or modification of the National Pollutant Discharge Elimination System permit for the point source.

R18-11-117. Canals and Municipal Park Lakes

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

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

R18-11-118. Dams and Flood Control Structures

A. Increases in turbidity that result from the routine physical or mechanical maintenance of dams and flood control structures ~~shall not be construed as~~ are not violations of this Article.

B. Nothing in this Article shall be construed to require a person who operates a dam or flood control structure to operate ~~such~~ the structure ~~so as~~ to cure or mitigate an exceedance of a water quality standard caused by another person.

C. Nothing in this Article shall be construed to require the releases of water from dams.

R18-11-120. Enforcement

A. Any person who causes a violation of a water quality standard or any provision of this Article is subject to the enforcement provisions prescribed in A.R.S. Title 49, Chapter 2, Article 4 ~~of the Arizona Revised Statutes~~.

B. ~~A numeric water quality standard may be established~~ The Department may establish a numeric water quality standard at a concentration that is below the practical quantitation limit. In such cases, the water quality standard is enforceable at the practical quantitation limit. ~~The applicable practical quantitation limits are prescribed in Appendix C of this Article.~~

C. ~~Compliance with acute aquatic and wildlife criteria shall be determined from the analytical test result of either a 1-hour composite sample or a grab sample~~ 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 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.

D. A person is not subject to penalties for violation of a water quality standard provided that ~~such~~ the person is in compliance with the provisions of a compliance schedule issued pursuant to R18-11-121.

R18-11-121. Schedules of Compliance

A. A schedule to bring an existing point source into compliance with a new or revised water quality standard ~~adopted after August 13, 1986~~ may be established in a National Pollutant Discharge Elimination System permit for the existing point source. A compliance schedule for an existing point source, other than a stormwater discharge, shall require compliance with a discharge limitation based upon a new or revised water quality standard no later than 3 years after the effective date of the ~~water quality standard~~ National Pollutant Discharge Elimination System permit. In order for a schedule of compliance to be granted, the owner or operator of the existing point source shall demonstrate that all requirements under §301(b) and §306 of the Clean Water Act have been achieved and that the point source cannot comply with a discharge limitation based upon the new or revised water quality standard through the application of existing water pollution control technology, operational changes, or source reduction.

B. A schedule of compliance shall not be established in a National Pollutant Discharge Elimination System permit for a new point source. For purposes of this subsection, 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.

C. A schedule to bring a point source discharge of storm water into compliance with a water quality standard may be established in a National Pollutant Discharge Elimination System permit. A compliance schedule for a storm water discharge shall require implementation of all reasonable and cost-effective best management practices to control the discharge of pollutants in storm water. ~~A compliance schedule shall require compliance with a water quality standard but no later than 10 years after the effective date of the water quality standard.~~

R18-11-122. Variances

A. The Director may grant a variance from a water quality standard for a point source discharge provided the discharger demonstrates that treatment more advanced than that required to comply with technology-based effluent limitations is necessary to comply with the water quality standard and:
   1. It is not technically feasible to achieve compliance within the next 5 years; or
   2. The cost of the treatment would result in substantial and widespread economic and social impact.

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

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

D. A variance is for a fixed term not to exceed 5 years. Upon expiration of a variance, a point source discharger shall either comply with the water quality standard or apply for renewal of the variance. In order for a variance to be renewed, the applicant shall demonstrate reasonable progress towards compliance with the water quality standard during the term of the variance.

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

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

G. In making a decision on whether to grant or deny the request for a variance, the Director shall consider the following factors: bioaccumulation, bioconcentration, predicted exposure of biota and the likelihood that resident biota will be adversely affected, the known or predicted safe exposure levels for the pollutant of concern, and the likelihood of adverse human health effects.

H. The Department shall issue public notice and shall provide an opportunity for a public hearing on whether the request for a variance should be granted or denied pursuant to procedures prescribed in A.A.C R18-1-401 and R18-1-402.

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

J. The Department shall not grant a variance for a point source discharge to a unique water listed in R18-11-112.

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

R18-11-123. Prohibition Against Discharge; Sabino Creek

The discharge of treated wastewater to Sabino Creek is prohibited.

PARAMETERS		AWS[1] (µg/L)	FC[1] (µg/L)	PDC[1] (µg/L)	A&Ww Acute[2] (µg/L)	A&Ww Chronic[3] (µg/L)	A&Wdw Acute[2] (µg/L)	A&Wdw Chronic[3] (µg/L)	A&We Acute[2] (µg/L)	A&We Chronic[3] (µg/L)	Agl[1] (µg/L)	AgL[1] (µg/L)
Acenaphthene		420	2600	8400	850	550	850	550	NNS	NNS	NNS	NNS
Acenaphthylene		0.003		8400	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Acrolein		110		0.12	NNS	34	NNS	34	NNS	NNS	NNS	NNS
Acrylonitrile	c	0.06		1300	34	30	34	30	NNS	NNS	NNS	NNS
Alachlor	c1	2		2.6	3800	250	3800	250	NNS	NNS	NNS	NNS
Aldrin	c	0.002		1400	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Ammonia		0.0003		0.64	2.0	NNS	2.0	NNS	4.5	NNS	1	1
Anthracene		2100		NNS	b	b	NNS	NNS	NNS	NNS	NNS	NNS
Antimony (as Sb)		6300		4200000	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Arsenic (as As)	c2	2.8 T		50 T	88 D	30 D	1000 D	600 D	NNS	NNS	NNS	NNS
Asbestos	c	4		NNS	360 D	190 D	360 D	190 D	440 D	230 D	NNS	200 T
Atrazine		3		NNS	NNS	NNS	NNS	NNS	NNS	NNS	2000 T	200 T
Barium (as Ba)		1000 D		NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzene	c1	5		NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzidine	c	0.0002		420	2700	180	11000	700	NNS	NNS	NNS	NNS
Benzo (a) anthracene	c	0.003		0.006	1300	89	1300	89	10000	640	0.01	0.01
Benzo (a) pyrene	c	0.003		0.12	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzo (ghi) perylene		0.003		0.12	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzo (k) fluoranthene	c	0.003		0.12	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
3,4-Benzofluoranthene	c	0.003		0.12	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Beryllium (as Be)	c	0.008 T		0.21 T	65 D	5.3 D	65 D	5.3 D	NNS	NNS	NNS	NNS
BHC-alpha	c	0.006		0.03	1600	130	1600	130	1600	130	NNS	NNS
BHC-beta	c	0.02		0.22	1600	130	1600	130	1600	130	NNS	NNS
BHC-delta	c	0.02		0.78	1600	130	1600	130	1600	130	NNS	NNS
BHC-gamma (lindane)	c	0.20		NNS	1600	130	1600	130	1600	130	NNS	NNS
Bis(2-chloroethoxy) methane		NNS		0.02	2.0	0.08	3.4	0.61	7.6	0.9	NNS	NNS
Bis(2-chloroethyl) ether	c	0.03		1	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Bis(2-chloroisopropyl) ether		280		1.4	NNS	6700	120000	6700	NNS	NNS	NNS	NNS
Bis-(2-ethylhexyl) phthalate	c	2.3		1.3	5600	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Boron (as B)		NNS		15000	5600	360	400	360	360	360	NNS	NNS
Bromoform		TTHM		7.4	280000	NNS	NNS	NNS	NNS	NNS	NNS	NNS
4-Bromophenyl phenyl ether		NNS		80	NNS	NNS	NNS	NNS	NNS	NNS	1000 T	NNS
Butyl benzyl phthalate		1400		180	2800	10000	15000	10000	15000	NNS	NNS	NNS
Cadmium (as Cd)		5 T		NNS	NNS	14	180	14	180	NNS	NNS	NNS
Carbofuran		40		83 T	28000	130	1700	130	1700	NNS	NNS	NNS
Carbon tetrachloride	c2	5		5.5	70 T	d D	d D	d D	d D	d D	50 T	50 T
Chlordane3		2		0.001	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Chlorine (Total residual)		NNS		NNS	8000	1100	18000	1100	18000	1100	NNS	NNS
Chlorobenzene		100		2800	110	0.004	2.4	0.21	2.4	0.21	NNS	NNS
Chlorodibromomethane		TTHM		17	NNS	5.0	11	5.0	11	5.0	0.45	NNS
Chloroethane		NNS		12	2800	620	9800	620	NNS	NNS	NNS	NNS
2-Chloroethyl vinyl ether		NNS		NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Chloroform		TTHM		590	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
2-Chloronaphthalene		560		1400	14000	900	180000	9800	NNS	NNS	NNS	NNS
2-Chlorophenol		35		13000	11000	NNS	NNS	NNS	NNS	NNS	NNS	NNS

PARAMETERS		DWS[1] (µg/L)		FC[1] (µg/L)		PBC[1] (µg/L)		A&We Acute[2] (µg/L)		A&We Chronic[3] (µg/L)		A&Ww Acute[2] (µg/L)		A&Ww Chronic[3] (µg/L)		A&Wedw Acute[2] (µg/L)		A&Wedw Chronic[3] (µg/L)		A&We Acute[2] (µg/L)		A&We Chronic[3] (µg/L)		Ag[1] (µg/L)		AgL[1] (µg/L)
3-methyl-4-Chlorophenol		NNS		NNS		NNS		15		4.7		15		4.7		15		4.7		48000		15000		NNS		NNS
4-Chlorophenyl phenyl ether		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
Chromium (as Cr)		100 T		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
Chromium (as Cr III)		NNS		140000 T		140000 T		eD		eD		eD		eD		eD		eD		NNS		NNS		1000 T		1000 T
Chromium (as Cr VI)		NNS		700 T		700 T		16 D		11 D		16 D		11 D		16 D		11 D		34 D		23 D		NNS		NNS
Chrysene	c	0.003		0.12		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
Copper (as Cu)		1000 D		NNS		5200 D		fD		fD		fD		fD		fD		fD		fD		fD		5000 T		500 T
Cyanide		140 T		210000 T		3100 T		22 T		5.2 T		41 T		9.7 T		41 T		9.7 T		84 T		19 T		NNS		200 T
DDD	c	0.15		0.0009		NNS		1.1		0.001		1.1		0.02		1.1		0.02		1.1		0.02		0.001		0.001
DDE	c	0.1		0.0006		NNS		1.1		0.001		1.1		0.02		1.1		0.02		1.1		0.03		0.001		0.001
DDT	c	0.1		0.0003		700		1.1		0.001		1.1		0.001		1.1		0.001		1.1		0.006		0.001		0.001
Dibenzo (ah) anthracene	c	0.003		0.00003		0.12		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
1,2-Dichlorobenzene		600		2800		13000		790		300		1200		470		1200		470		5900		2300		NNS		NNS
1,3-Dichlorobenzene		94		1280		13000		2500		970		2500		970		2500		970		NNS		NNS		NNS		NNS
1,4-Dichlorobenzene		75		1200		13000		360		210		2000		780		2000		780		6590		2500		NNS		NNS
3,3-Dichlorobenzidine	c	0.08		0.09		3.1		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
Dichlorobromomethane	c	TTHM		10		11		2800		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
Dichlorobromopropane	c3	0.2		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
1,1-Dichloroethane		NNS		NNS		14000		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
1,2-Dichloroethane	c4	5		120		16000		59000		1000		59000		41000		59000		41000		NNS		NNS		NNS		NNS
1,1-Dichloroethylene	c5	7		4.5		1300		15000		1000		15000		930		15000		930		NNS		NNS		NNS		NNS
1,2-cis-Dichloroethylene		70		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
1,2-trans-Dichloroethylene		100		13000		2800		68000		3900		68000		3900		68000		3900		NNS		NNS		NNS		NNS
2,4-Dichlorophenol		21		810		420		1000		88		1000		88		1000		88		NNS		NNS		NNS		NNS
Dichlorophenoxyacetic acid		70		420		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS
1,2-Dichloropropane	c6	5		NNS		200		26000		9200		26000		9200		26000		9200		NNS		NNS		NNS		NNS
1,3-Dichloropropene		2.1		360		60		3000		1100		3000		1100		3000		1100		NNS		NNS		NNS		NNS
Dieldrin	c	0.002		0.0002		0.09		2.5		0.002		2.5		0.002		2.5		0.005		4.0		0.9		NNS		1
Diethyl phthalate		5600		110000		110000		26000		1600		26000		1600		26000		1600		NNS		NNS		NNS		
Dimethyl phthalate		70000		2800000		140000000		17000		1000		17000		1000		17000		1000		NNS		NNS		NNS		
2,4-Dimethylphenol		140		2200		28000		1000		310		1000		310		1000		310		NNS		43000		NNS		
2,4-Dinitrophenol		14		5400		280		110		9.2		110		9.2		310		9.2		139000		NNS		NNS		
2-methyl-4,6-Dinitrophenol		2.7		120		550		310		24		310		24		310		24		NNS		NNS		NNS		
2,4-Dinitrotoluene	c	0.009		0.02		0.38		15000		970		15000		970		15000		970		NNS		NNS		NNS		
2,6-Dinitrotoluene		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		
2,3,7,8-TCDD (Dioxin)	c	0.00000002		0.0000000004		NNS		0.01		0.005		0.01		0.005		0.12		NNS		0.1		0.01		NNS		
1,2-Diphenylhydrazine	c	0.04		0.25		1.8		130		11		130		11		130		11		NNS		NNS		NNS		
Di-n-butyl phthalate		700		2300		14000		470		35		470		35		470		35		NNS		84		NNS		
Di-n-octyl phthalate		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		NNS		
Endosulfan sulfate		0.35		0.78		NNS		0.22		0.06		0.22		0.06		0.22		0.06		1.5		1.5		NNS		
Endosulfan-alpha		0.35		0.92		70		0.22		0.06		0.22		0.06		0.22		0.06		1.5		1.5		NNS		
Endosulfan-beta		0.35		0.92		70		0.22		0.06		0.22		0.06		0.22		0.06		1.5		1.5		NNS		
Endrin		0.2		1.1		70		NNS		0.22		0.06		0.22		0.06		0.22		3.0		1.5		NNS		
Endrin aldehyde		1		40		40		0.18		0.002		0.2		0.08		0.2		0.08		0.7		0.3		NNS		
Ethylbenzene		2.1		0.81		420		NNS		0.18		0.2		0.08		0.2		0.08		0.7		0.3		0.004		0.004
Ethylene dibromide	c7	0.05		110000		64000		64000		23000		1400		23000		1400		23000		NNS		NNS		NNS		NNS
Fluoranthene		280		130		NNS		5600		NNS		1600		NNS		1600		NNS		NNS		NNS		NNS		NNS

PARAMETERS		DWS[1]	FC[1]	PBC[1]	A&We Acute[2]	A&We Chronic[3]	A&Ww Acute[2]	A&Ww Chronic[3]	A&Wedw Acute[2]	A&Wedw Chronic[3]	A&We Acute[2]	A&We Chronic[3]	Ag[1]	Ag[1,]
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Fluorene		280	5600	5600	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Fluoride		4000	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Heptachlor	c8	0.400	0.31	20	0.52	0.004	0.52	0.004	0.38	0.013	0.9	0.1	NNS	NNS
Heptachlor epoxide	c8	0.200	0.15	2	0.52	0.004	0.52	0.004	0.38	0.013	0.9	0.1	NNS	NNS
Hexachlorobenzene	c	0.02	0.83	100	6.0	3.7	NNS	NNS	0.58	0.013	0.9	0.1	NNS	NNS
Hexachlorobutadiene	c	0.45	18	280	45	8.2	45	8.2	NNS	NNS	NNS	NNS	NNS	NNS
Hexachlorocyclopentadiene	c	49	1000	1000	3.5	0.3	3.5	0.3	45	8.2	NNS	NNS	NNS	NNS
Hexachloroethane	c	2.5	330	140	490	350	490	350	3.5	0.3	NNS	NNS	NNS	NNS
Indeno (1,2,3-cd) pyrene	c	0.003	0.0000003	NNS	NNS	NNS	NNS	NNS	2.6 D	0.2 D	5.0 D	2.7 D	NNS	10 T
Isophorone		8.5	520	NNS	59000	43000	59000	43000	NNS	NNS	NNS	610	NNS	NNS
Lead (as Pb)		50 T	340	28000	g D	g D	g D	g D	NNS	NNS	NNS	NNS	NNS	NNS
Manganese (as Mn)		NNS	NNS	NNS	NNS	NNS	NNS	NNS	g D	g D	g D	g D	10000 T	100 T
Mercury (as Hg)		2.1 T	0.6 T	42 T	2.4 D	0.01 D	2.4 D	0.01 D	NNS	NNS	NNS	NNS	10000	NNS
Methoxychlor		40	NNS	NNS	NNS	NNS	NNS	NNS	2.6 D	0.2 D	5.0 D	2.7 D	NNS	10 T
Methyl bromide		9.8	7500	200	200	360	5100	360	NNS	NNS	NNS	NNS	NNS	NNS
Methyl chloride	c	5.7	1800	2800	270000	15000	270000	15000	5300	360	NNS	NNS	NNS	NNS
Methylene chloride	c	4.7	480	27000	97000	3500	97000	5500	270000	15000	NNS	NNS	NNS	NNS
Naphthalene		4.7	190	560	2300	510	3300	600	97000	3500	NNS	NNS	NNS	NNS
Nickel (as Ni)		NNS	560	1100	h D	h D	h D	h D	3300	600	NNS	NNS	NNS	NNS
Nitrate (as N)		140 T	2800 T	2800 T	NNS	NNS	NNS	NNS	h D	h D	h D	h D	NNS	NNS
Nitrate/nitrite (Total as N)		10000	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Nitrite (as N)		10000	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Nitrobenzene		1000	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
2-Nitrophenol		3.5	600	70	13000	850	13000	850	2.0	0.02	11	2.5	NNS	NNS
4-Nitrophenol		NNS	NNS	NNS	NNS	NNS	4100	NNS	13000	850	NNS	NNS	NNS	NNS
N-nitrosodimethylamine	c	0.0007	NNS	NNS	NNS	NNS	NNS	NNS	4100	NNS	NNS	NNS	NNS	NNS
N-nitrosodiphenylamine	c	7.1	12	290	2900	200	2900	200	NNS	NNS	NNS	NNS	NNS	NNS
N-nitrosodi-n-propylamine	c	0.005	0.51	0.2	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
PCBs	c9	0.5	0.000079	0.18	2.0	0.01	2.0	0.02	2.0	0.02	11	2.5	NNS	0.001
Pentachlorophenol		210	29000	2000	30	6.3	30	6.3	7000	1000	NNS	1	NNS	NNS
Phenanthrene		0.003	0.0003	NNS	5100	730	7000	1000	NNS	NNS	180000	26000	NNS	NNS
Phenol		4200	6300000	84000	4200	NNS	NNS	NNS	20 T	2.0 T	NNS	NNS	NNS	NNS
Pyrene		210	1100	4200	420 T	2.0 T	20 T	2.0 T	50 T	2.0 T	33 T	2.0 T	20 T	50 T
Selenium (as Se)		50 T	9900	420	NNS	NNS	J D	NNS	J D	NNS	J D	NNS D	NNS	NNS
Silver (as Ag)	c9	100	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Styrene		NNS	NNS	NNS	NNS	NNS	100	NNS	100	NNS	100	NNS	NNS	NNS
Sulfides		NNS	NNS	NNS	100	NNS	4700	3200	4700	3200	4700	NNS	NNS	NNS
1,1,2,2-Tetrachloroethane	c	0.17	11	7	4700	3200	4700	3200	4700	3200	4700	NNS	NNS	NNS
Tetrachloroethylene	c	3.00	11	35	2600	280	6500	680	6500	680	15000	1600	NNS	NNS
Thallium (as Tl)	c10	0.63 T	44 T	4000	420 T	2.0 T	J D	NNS	50 T	2.0 T	NNS	2.0 T	20 T	50 T
Toluene		1000	99000	3700 T	NNS	NNS	700 D	150 D	700 D	150 D	NNS	NNS	NNS	NNS
Toxaphene	c9	3.0	0.0008	42000	8700	180	8700	180	8700	180	180	NNS	NNS	NNS
2,4,5-TP (rn)		50	NNS	1000	0.73	0.0002	0.73	0.02	0.73	0.02	11	NNS	NNS	0.005
1,2,4-Trichlorobenzene		NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
1,1,1-Trichloroethane		200	160000	2800	750	130	1700	300	NNS	NNS	NNS	NNS	NNS	NNS
1,1,2-Trichloroethane	c11	0.61	31	13000	2600	1600	2600	1600	2600	1600	NNS	NNS	NNS	NNS
Trichloroethylene	c12	5.0	78	360	18000	12600	18000	12000	18000	12000	NNS	NNS	NNS	NNS
				NNS	20000	1300	20000	1300	20000	1300	NNS	NNS	NNS	NNS

PARAMETER		DWS[1] (µg/L)	FC[1] (µg/L)	FBC[1] (µg/L)	PBC[1] (µg/L)	A&Wc Acute[2] (µg/L)	A&Wc Chronic[3] (µg/L)	A&Ww Acute[2] (µg/L)	A&Ww Chronic[3] (µg/L)	A&Wedw Acute[2] (µg/L)	A&Wedw Chronic[3] (µg/L)	A&We Acute[2] (µg/L)	A&We Chronic[3] (µg/L)	Ag[1] (µg/L)	Ag[1] (µg/L)
2,4,6-Trichlorophenol	c	3.2	4.9	130	NNS	160	25	160	25	160	25	3000	460	NNS	NNS
Trihalomethanes, Total		100	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Uranium (as U)		35 D	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Vinyl chloride	c13	2.0	620	80	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Xylenes (Total)		10000	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Zinc (as Zn)		5000	NNS	28000	28000	k D	k D	k D	k D	k D	k D	k D	k D	10000 T	23000 T

µg/L - micrograms per liter

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

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

c - Indicates that the parameter is a known, probable or possible human carcinogen and that the standards to protect DWS, FC and FBC are based on carcinogenicity. A "c" by itself indicates that the excess cancer risk level for the DWS designated use is 1×10^{-6}. A "c" followed by a number indicates that the excess cancer risk level for the DWS designated use only is greater than 1×10^{-6}. These excess cancer risk levels, multiplied by 10^{-6} are: c1=5; c2=1/7; c3=67; c4=13; c5=117; c6=[illegible] c7=125; c8=50; c9=100; c10=7; c11=8; c12=2; and c13=133. The excess cancer risk level for the FC and FBC designated uses is 1×10^{-6}.

d - Cadmium -
- A&We acute standard: $e^{(1.128\,[\ln(Hardness)] - 3.828)}$
- A&We chronic standard: $e^{(0.7852\,[\ln(Hardness)] - 3.490)}$
- A&Ww acute standard: $e^{(1.128\,[\ln(Hardness)] - 2.0149)}$
- A&Ww chronic standard: $e^{(0.7852\,[\ln(Hardness)] - 3.490)}$
- A&Wedw acute standard: $e^{(1.128\,[\ln(Hardness)] - 2.0149)}$
- A&Wedw chronic standard: $e^{(0.7852\,[\ln(Hardness)] - 3.490)}$
- A&We acute standard: $e^{(1.128\,[\ln(Hardness)] - 0.9591)}$
- A&We chronic standard: $e^{(0.7852\,[\ln(Hardness)] - 3.490)}$
- (See Footnote 4)

e - Chromium III -
- A&We acute standard: $e^{(0.8190\,[\ln(Hardness)] + 3.688)}$
- A&We chronic standard: $e^{(0.8190\,[\ln(Hardness)] + 1.561)}$
- A&Ww acute standard: $e^{(0.8190\,[\ln(Hardness)] + 3.688)}$
- A&Ww chronic standard: $e^{(0.8190\,[\ln(Hardness)] + 1.561)}$
- A&Wedw acute standard: $e^{(0.8190\,[\ln(Hardness)] + 4.9361)}$
- A&Wedw chronic standard: $e^{(0.8190\,[\ln(Hardness)] + 1.561)}$
- A&We acute standard: $e^{(0.8190\,[\ln(Hardness)] + 3.688)}$
- A&We chronic standard: $e^{(0.8190\,[\ln(Hardness)] + 1.561)}$
- (See Footnote 4)

f - Copper -
- A&We acute standard: $e^{(0.9422\,[\ln(Hardness)] - 1.464)}$
- A&We chronic standard: $e^{(0.8545\,[\ln(Hardness)] - 1.465)}$
- A&Ww acute standard: $e^{(0.9422\,[\ln(Hardness)] - 1.464)}$
- A&Ww chronic standard: $e^{(0.8545\,[\ln(Hardness)] - 1.465)}$
- A&Wedw acute standard: $e^{(0.9422\,[\ln(Hardness)] - 1.464)}$
- A&Wedw chronic standard: $e^{(0.8545\,[\ln(Hardness)] - 1.465)}$
- A&We acute standard: $e^{(0.9422\,[\ln(Hardness)] - 1.1514)}$
- A&We chronic standard: $e^{(0.8545\,[\ln(Hardness)] - 1.1848)}$
- (See Footnote 4)

g - Lead - A&Wc acute standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 1.460)}$
A&Wc chronic standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 4.705)}$
A&Ww acute standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 1.460)}$
A&Ww chronic standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 4.705)}$
A&Wedw acute standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 1.460)}$
A&Wedw chronic standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 4.705)}$
A&We acute standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 0.7131)}$
A&We chronic standard: $e^{(1.2730\ [\ln(\text{Hardness})] - 3.9518)}$
(See Footnote 4)

h - Nickel - A&Wc acute standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 3.3611)}$
A&Wc chronic standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 1.1644)}$
A&Ww acute standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 3.3611)}$
A&Ww chronic standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 1.1644)}$
A&Wedw acute standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 3.3611)}$
A&Wedw chronic standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 1.1644)}$
A&We acute standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 4.4389)}$
A&We chronic standard: $e^{(0.8460\ [\ln(\text{Hardness})] + 2.2417)}$
(See Footnote 4)

i - Pentachlorophenol - A&Wc acute standard: $e^{(1.005\ (\text{pH}) - 4.830)}$
A&Wc chronic standard: $e^{(1.005\ (\text{pH}) - 5.290)}$
A&Ww acute standard: $e^{(1.005\ (\text{pH}) - 4.830)}$
A&Ww chronic standard: $e^{(1.005\ (\text{pH}) - 5.290)}$
A&Wedw acute standard: $e^{(1.005\ (\text{pH}) - 4.830)}$
A&Wedw chronic standard: $e^{(1.005\ (\text{pH}) - 5.290)}$
A&We acute standard: $e^{(1.005\ (\text{pH}) - 3.4306)}$
A&We chronic standard: $e^{(1.005\ (\text{pH}) - 3.9006)}$
(See Footnote 5)

j - Silver - A&Wc acute standard: $e^{(1.72\ (\ln) - 6.52)}$
A&Ww acute standard: $e^{(1.72\ (\ln) - 6.52)}$
A&Wedw acute standard: $e^{(1.72\ (\ln) - 6.52)}$
A&Ww acute standard: $e^{(1.72\ (\ln) - 6.52)}$
(See Footnote 4)

k - Zinc - A&Wc acute standard: $e^{(0.8473\ (\ln) + 0.860)}$
A&Wc chronic standard: $e^{(0.8473\ (\ln) + 0.761)}$
A&Ww acute standard: $e^{(0.8473\ (\ln) + 0.860)}$
A&Ww chronic standard: $e^{(0.8473\ (\ln) + 0.761)}$
A&Wedw acute standard: $e^{(0.8473\ (\ln) + 0.860)}$
A&Wedw chronic standard: $e^{(0.8473\ (\ln) + 0.761)}$
A&We acute standard: $e^{(0.8473\ (\ln) + 3.1342)}$
A&We chronic standard: $e^{(0.8473\ (\ln) + 3.0484)}$

l - The standard to protect this use is 0.003 µg/l aldrin/dieldrin.
m - 2,4,5-Trichlorophenoxyacetic acid

1 - The numeric standards to protect this use shall not be exceeded.
2 - Determination of compliance with acute standards shall be as prescribed in R18-11-120(C).
3 - Determination of compliance with chronic standards shall be as prescribed in R18-11-120(C).
4 - Hardness is determined pursuant to the methods specified for the definition of hardness Section 101. Hardness is determined from a sample taken at the same time and place that the sample for the metal is taken. Hardness, expressed as mg/l $CaCO_3$, is then inserted into the equation where it says "Hardness".
5 - The pH at the time and location that the sample for pentachlorophenol was taken is inserted into the equation where it says "pH".

NNS - No numeric standard.
D - Dissolved
T - Total recoverable
TTHM - Indicates that the chemical is a trihalomethane. See trihalomethanes for DWS standard.

A&W - ACUTE

Total Ammonia mg-N/l (or mg NH_3-N/liter)

pH	Temperature in Degrees Celsius 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	25	30 and above	pH
6.5	29	28	27	27	27	27	27	26	26	26	25	25	25	25	25	24	24	24	24	24	24	16.6	11.8	6.5
6.6	28	27	27	27	26	26	26	25	25	25	25	24	24	24	24	24	24	23	23	23	23	16.2	11.4	6.6
6.7	27	27	26	25	26	25	25	25	24	24	24	24	24	23	23	23	23	23	23	22	22	15.6	11.1	6.7
6.8	26	25	25	25	24	24	24	24	24	24	23	23	23	23	23	23	23	22	22	22	22	15.0	10.6	6.8
6.9	25	24	24	24	24	23	24	24	23	23	23	23	23	22	22	22	22	22	22	22	21	15.0	10.6	6.9
7.0	23	23	22	22	22	22	23	22	22	22	22	22	21	21	21	21	21	21	21	21	20	14.3	10.1	7.0
7.1	22	21	21	21	20	22	21	21	21	21	20	20	20	20.0	19.9	19.7	19.6	19.5	19.4	19.3	19.2	13.4	9.5	7.1
7.2	19.8	19.6	19.2	19.0	18.8	20	19.9	19.6	19.5	19.3	19.1	18.9	18.8	18.6	18.5	18.4	18.3	18.2	18.1	18.0	17.9	12.5	8.9	7.2
7.3	18.0	17.8	17.5	17.3	17.1	16.9	18.4	18.1	17.9	17.8	17.6	17.5	17.3	17.2	17.0	16.9	16.8	16.7	16.7	16.6	16.5	11.6	8.2	7.3
7.4	16.2	16.0	15.7	15.5	15.3	15.1	16.7	16.5	16.3	16.2	16.0	15.9	15.8	15.6	15.5	15.4	15.3	15.2	15.2	15.1	15.0	10.6	7.5	7.4
7.5	14.3	14.1	13.9	13.7	13.6	13.4	15.0	14.8	14.6	14.5	14.4	14.3	14.1	14.0	13.9	13.8	13.8	13.7	13.6	13.6	13.5	9.5	6.7	7.5
7.6	12.5	12.3	12.2	12.0	11.9	11.7	13.0	13.1	13.0	12.8	12.7	12.6	12.5	12.4	12.4	12.3	12.2	12.1	12.1	12.1	12.0	8.4	6.0	7.6
7.7	10.8	10.7	10.5	10.4	10.3	10.1	11.6	11.5	11.4	11.2	11.2	11.1	11.0	10.9	10.8	10.8	10.7	10.6	10.6	10.5	10.3	7.4	5.3	7.7
7.8	9.2	9.1	9.0	8.9	8.8	8.7	10.0	9.9	9.8	9.7	9.6	9.6	9.5	9.5	9.3	9.3	9.2	9.2	9.2	9.1	9.1	6.4	4.6	7.8
7.9	7.8	7.7	7.6	7.5	7.4	7.3	8.6	8.5	8.4	8.3	8.2	8.2	8.1	8.1	8.0	8.0	7.9	7.9	7.9	7.8	7.8	5.5	4.0	7.9
8.0	6.5	6.4	6.4	6.3	6.2	6.1	7.2	7.2	7.1	7.0	7.0	6.9	6.9	6.8	6.8	6.7	6.7	6.7	6.7	6.6	6.6	4.7	3.4	8.0
8.1	5.2	5.1	5.1	5.0	4.9	4.9	6.1	6.0	5.9	5.9	5.8	5.8	5.8	5.7	5.7	5.7	5.6	5.6	5.6	5.6	5.6	4.0	2.9	8.1
8.2	4.2	4.1	4.0	4.0	4.0	3.9	4.8	4.8	4.7	4.7	4.7	4.6	4.6	4.6	4.6	4.5	4.5	4.9	4.5	4.5	4.5	3.2	2.3	8.2
8.3	3.3	3.3	3.2	3.2	3.1	3.1	3.9	3.8	3.8	3.8	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.6	1.89	8.3
8.4	2.6	2.6	2.6	2.5	2.5	2.5	3.1	3.1	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.1	1.53	8.4
8.5	2.1	2.1	2.1	2.0	2.0	2.0	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3	2.4	2.4	1.71	1.27	8.5
8.6	1.68	1.66	1.65	1.63	1.61	1.60	1.98	1.96	1.95	1.94	1.93	1.92	1.91	1.90	1.90	1.90	1.90	1.90	1.90	1.91	1.92	1.41	1.05	8.6
8.7	1.35	1.33	1.32	1.31	1.30	1.29	1.59	1.58	1.57	1.56	1.55	1.55	1.54	1.54	1.54	1.54	1.54	1.55	1.55	1.56	1.57	1.16	0.88	8.7
8.8	1.08	1.07	1.06	1.05	1.04	1.04	1.28	1.27	1.26	1.26	1.25	1.25	1.25	1.25	1.25	1.25	1.26	1.26	1.27	1.28	1.29	0.96	0.74	8.8
8.9	0.87	0.86	0.86	0.85	0.84	0.84	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.03	1.04	1.05	1.06	1.07	0.81	0.63	8.9
9.0	0.70	0.70	0.69	0.69	0.69	0.68	0.84	0.84	0.83	0.83	0.83	0.83	0.84	0.84	0.84	0.85	0.85	0.86	0.87	0.88	0.89	0.69	0.55	9.0
														0.69	0.70	0.70	0.71	0.72	0.73	0.74	0.75	0.59	0.48	

NOTES:

1. pH and temperature are field measurements taken at the same time and location as the water samples destined for the laboratory analysis of ammonia.
2. If field measured pH and/or temperature values fall between the A&Wc Acute Total Ammonia tabular values, round field measured values according to standard rounding procedures to nearest tabular value to determine ammonia standard.

A&Ww - ACUTE

Total Ammonia mg-N/liter (or mg NH3-N/liter)

Temperature in Degrees Celsius

pH	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	pH
6.5	29	28	28	27	27	27	27	26	26	26	25	25	25	25	25	6.5
6.6	28	27	27	27	26	26	26	25	25	25	25	25	24	24	24	6.6
6.7	27	27	26	26	26	25	25	25	24	24	24	24	23	23	23	6.7
6.8	26	25	25	25	24	24	24	24	23	23	23	23	23	22	22	6.8
6.9	25	24	24	24	[illegible]	23	23	22	22	22	22	22	21	21	21	6.9
7.0	23	23	22	22	22	22	21	22	21	21	20	20	20	20	20	7.0
7.1	22	21	21	21	20	20	20	20	19.5	19.3	19.1	18.9	18.8	18.6	18.5	7.1
7.2	20	20	19.2	19.0	18.8	[illegible]	18.4	18.1	17.9	17.8	17.6	17.5	17.3	17.2	17.0	7.2
7.3	18.0	17.8	17.5	17.3	17.1	16.9	16.7	16.5	16.3	16.2	16.0	15.9	15.8	15.6	15.5	7.3
7.4	16.2	16.0	15.7	15.5	15.3	15.1	[illegible]	14.8	14.7	14.5	14.4	14.3	14.1	14.0	13.9	7.4
7.5	14.3	14.1	13.9	13.7	13.6	13.4	[illegible]	13.1	13.0	12.8	12.7	12.6	12.5	12.4	12.4	7.5
7.6	12.5	12.3	12.2	12.0	11.9	11.7	11.6	11.5	11.4	11.3	11.2	11.1	11.0	10.9	10.8	7.6
7.7	10.8	10.7	10.5	10.4	10.3	10.1	10.0	[illegible]	9.8	9.7	9.6	9.6	9.5	9.5	9.3	7.7
7.8	9.2	9.1	9.0	8.9	8.8	8.7	8.6	8.5	8.4	8.3	8.2	8.2	8.1	8.1	8.0	7.8
7.9	7.8	7.7	7.6	7.5	7.4	7.3	7.2	7.2	[illegible]	7.0	7.0	6.9	6.9	6.8	6.8	7.9
8.0	6.5	6.4	6.4	6.3	6.2	6.1	6.1	6.0	[illegible]	5.9	5.8	5.8	5.8	5.7	5.7	8.0
8.1	5.2	5.1	5.1	5.0	4.9	4.9	4.8	4.8	4.8	4.7	4.7	4.6	4.6	4.6	4.6	8.1
8.2	4.2	4.1	4.0	4.0	4.0	3.9	3.9	3.8	3.8	[illegible]	3.7	3.7	3.7	3.7	3.6	8.2
8.3	3.3	3.3	3.2	3.2	3.1	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	2.9	2.9	8.3
8.4	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	8.4
8.5	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	1.95	1.94	[illegible]	1.92	1.91	1.90	1.90	8.5
8.6	1.68	1.66	1.65	1.63	1.61	1.60	1.59	1.58	1.57	1.56	1.55	1.55	1.54	1.54	1.54	8.6
8.7	1.35	1.33	1.32	1.31	1.30	1.29	1.28	1.27	1.26	1.26	1.25	1.25	1.25	1.25	1.25	8.7
8.8	1.08	1.07	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	8.8
8.9	0.87	0.86	0.86	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.83	0.83	0.84	0.84	0.84	8.9
9.0	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.69	0.69	0.70	9.0

NOTES:

1. pH and temperature are field measurements taken at the same time and location as the water samples destined for the laboratory analysis of ammonia.
2. If field measured pH and/or temperature values fall between the A&Ww Acute Total Ammonia tabular values, round field measured values according to standard scientific rounding procedures to nearest tabular value to determine the ammonia standard.

A&Ww - ACUTE

Total Ammonia mg-N/liter (or mg NH3-N/liter) (cont.)

pH	Temperature in Degrees Celsius																					pH
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30 and above	
6.5	24	24	24	23	24	24	24	24	24	24	23	22	20	19.1	17.8	16.6	6.5
6.6	24	24	23	23	23	23	23	23	23	23	23	21	20	18.5	17.3	16.1	6.6
6.7	23	23	23	23	22	22	22	22	22	22	22	21	19.2	17.9	16.7	15.6	6.7
6.8	22	22	22	22	22	21	21	21	21	21	21	20	18.4	17.2	16.1	15.0	6.8
6.9	21	21	21	21	21	20	20	20	20	20	20	18.8	17.5	16.4	15.3	14.3	6.9
7.0	20	20	20	19.4	19.3	19.2	19.1	19.1	19.1	19.0	19.0	17.7	16.5	15.4	14.4	13.4	7.0
7.1	18.4	18.3	18.2	18.1	18.0	17.9	17.8	17.8	17.8	17.7	17.7	16.5	15.4	14.4	13.4	12.6	7.1
7.2	16.9	16.8	16.7	16.7	16.6	16.5	16.5	16.4	16.4	16.4	16.3	15.2	14.2	13.3	12.4	11.6	7.2
7.3	15.4	15.3	15.2	15.2	15.1	15.0	15.0	15.0	14.9	14.9	14.9	13.9	12.9	12.0	11.3	10.6	7.3
7.4	13.8	13.8	13.7	13.6	13.6	13.5	13.5	13.5	13.4	13.4	13.4	12.5	11.6	10.9	10.2	9.5	7.4
7.5	12.3	12.2	12.2	12.1	12.1	12.0	12.0	12.0	11.9	11.9	11.9	11.1	10.4	9.7	9.1	8.5	7.5
7.6	10.8	10.7	10.6	10.6	10.5	10.5	10.5	10.5	10.4	10.4	10.5	9.8	9.1	8.5	8.0	7.4	7.6
7.7	9.3	9.2	9.2	9.2	9.1	9.1	9.1	9.1	9.1	9.1	9.1	8.5	7.9	7.4	6.9	6.5	7.7
7.8	8.0	7.9	7.9	7.9	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.3	6.8	6.4	6.0	5.6	7.8
7.9	6.7	6.7	6.7	6.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.2	5.8	5.4	5.1	4.8	7.9
8.0	5.7	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.2	4.9	4.6	4.3	4.0	8.0
8.1	4.5	4.5	4.9	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.2	4.0	3.7	3.5	3.3	8.1
8.2	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.4	3.2	3.0	2.8	2.7	8.2
8.3	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.6	2.5	2.3	2.2	8.3
8.4	2.4	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.1	2.0	1.90	1.80	8.4
8.5	1.90	1.90	1.90	1.90	1.91	1.92	1.92	1.93	1.95	1.96	1.99	1.86	1.77	1.66	1.57	1.49	8.5
8.6	1.54	1.54	1.55	1.55	1.56	1.57	1.58	1.58	1.60	1.62	1.63	1.5	1.46	1.38	1.31	1.24	8.6
8.7	1.25	1.26	1.26	1.27	1.28	1.29	1.30	1.31	1.33	1.34	1.36	1.29	1.22	1.16	1.10	1.05	8.7
8.8	1.03	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.11	1.12	1.14	1.09	1.03	0.98	0.94	0.90	8.8
8.9	0.85	0.85	0.86	0.87	0.88	0.89	0.91	0.92	0.93	0.95	0.97	0.93	0.88	0.84	0.81	0.77	8.9
9.0	0.70	0.71	0.72	0.73	0.74	0.75	0.77	0.78	0.80	0.81	0.83	0.80	0.76	0.73	0.70	0.68	9.0

NOTES:

1. pH and temperature are field measurements taken at the same time and location as the water samples obtained for the laboratory analysis of ammonia.
2. If field measured pH and/or temperature values fall between the A&Ww Acute Total Ammonia tabular values, round field measured values according to standard scientific rounding procedures to nearest tabular value to determine the ammonia standard.

Appendix B. List of Navigable Waters and Designated Uses

Navigable water	Designated Use
COLORADO MAIN STEM RIVER BASIN	
A-10 Backwater	A&Ww, FBC, FC
A-7 Backwater	A&Ww, FBC, FC
Agate Creek	A&Wc, FBC, DWS, FC
Alamo Lake	A&Ww, FBC, FC
Big Sandy River	A&Ww, FBC, FC, AgL
Big Springs Tank	A&Wc, FBC, FC, AgL
Bill Williams River	A&Ww, FBC, FC, AgL
Blue Tank	A&Ww, FBC, FC, AgL
Boucher Creek	A&Wc, FBC, DWS, FC
Boulder Creek	A&Ww, FBC, FC, AgI, AgL
Bright Angel Creek	A&Wc, FBC, DWS, FC
Bright Angel Wash[1] (Grand Canyon WWTP to Cataract Creek)	A&Wedw, PBC
Bull Rush Canyon Wash	A&We, PBC
Burro Creek[2] (above confluence with Boulder Creek)	A&Ww, FBC, FC, Ag
Cataract Creek (Headwaters to Williams WWTP)	A&Wc, FBC, DWS, FC, AgI, AgL
Cataract Creek[1] (Williams WWTP to 3 km downstream)	A&Wedw, PBC
Cataract Creek (Below 3 km downstream of Williams WWTP)	A&Wc, FBC, F[illegible] AgI, AgL
Cataract Lake	A&Wc, FBC[illegible]WS, FC, AgL
Chuar Creek	A&Wc, FB[illegible] DWS, FC
Cibola Lake	A&Ww, [illegible]BC, FC
City Reservoir	A&W[illegible]FBC, DWS, FC
Clear Creek	A&W[illegible], FBC, DWS, FC
Colorado River (Lake Powell to Topock)	A&[illegible]c, FBC, DWS, FC, AgI, AgL
Colorado River (Topock to Mexico)	[illegible]Ww, FBC, DWS, FC, AgI, AgL
Coors Lake	[illegible]Ww, FBC, FC
Cottonwood Creek	A&Ww, FBC, DWS
Crystal Creek	A&Wc, FBC, DWS, FC
Deer Creek	A&Wc, FBC, DWS, FC
Detrital Wash	A&We, PBC
Diamond Creek	A&Wc, FBC, FC, AgL
Dogtown Reservoir	A&Wc, FBC, DWS, FC, AgI, AgL
Dragon Creek	A&Ww, FBC, DWS, FC
Francis Creek[2]	A&Ww, FBC, DWS, FC, AgL
Garden Creek	A&Wc, FBC, DWS, FC
Gila River (See listing in Middle Gila River Basin)	
Grand Wash	A&We, PBC
Granite Park Canyon Creek	A&Wc, FBC, FC
Grapevine Creek	A&Wc, FBC, DWS, FC
Grapevine Wash	A&We, PBC
Hakatai Creek	A&Wc, FBC, DWS, FC
Hance Creek	A&Wc, FBC, DWS, FC
Havasu Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Hermit Creek	A&Wc, FBC, DWS, FC
Holy Moses Wash[1] (Kingman WWTP [illegible]5 km downstream)	A&Wedw, PBC
Horn Creek	A&Wc, FBC, DWS, FC
Hualapai Wash	A&Ww, PBC
Hunter's Hole Backwater	A&Ww, FBC, FC
Imperial Reservoir	A&Ww, FBC, DWS, FC, AgI, AgL
Jacob Lake	A&Ww, FBC
Kaibab Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Kaibito Creek	A&Ww, FBC, FC, AgL
Kanab Creek	A&Ww, FBC, DWS, FC, AgL
Kirkland Creek	A&Ww, FBC, FC, AgI, AgL
Kwagunt Creek	A&Wc, FBC, DWS, FC
Laguna Reservo[illegible]	A&Ww, FBC, DWS, FC, AgI, AgL
Lake Havasu	A&Ww, FBC, DWS, FC, AgI, AgL
Lake Mead	A&Wc, FBC, DWS, FC, AgI, AgL
Lake Moh[illegible]e	A&Wc, FBC, DWS, FC, AgI, AgL
Lake Po[illegible]ell	A&Wc, FBC, DWS, FC, AgI, AgL
Lonet[illegible]e Canyon Creek	A&Ww, PBC, DWS
Mar[illegible]ez Lake	A&Ww, FBC, FC, AgI, AgL
M[illegible]katamiba Creek	A&Wc, FBC, DWS, FC
[illegible]ttry Lake	A&Ww, FBC, FC
Mohave Wash	A&We, PBC

Navigable water	Designated Use
COLORADO MAIN STEM RIVER BASIN (cont.)	
Monument Creek	A&Ww, FBC, DWS, FC
Nankoweap Creek	A&Wc, FBC, DWS, FC
National Canyon Creek	A&Wc, FBC, DWS, FC
Navajo Creek	A&Ww, FBC, FC, AgL
North Canyon Creek	A&Wc, FBC, DWS, FC
Olo Creek	A&Ww, FBC, DWS, FC
Paria River	A&Wc, FBC, DWS, FC
Peeple's Canyon Creek[2]	A&Ww, FBC, AgL
Phantom Creek	A&Wc, FBC, DWS, FC
Pipe Creek	A&Wc, FBC, DWS, FC
Pretty Water Lake	A&Ww, FBC, FC
Quigley Ponds	A&Ww, FBC, FC
Red Canyon Creek	A&Ww, FBC, DWS
Redondo Lake	A&Ww, FBC, FC
Roaring Springs Creek	A&Wc, FBC, DWS, FC
Royal Arch Creek	A&Wc, FBC, DWS, FC
Ruby Creek	A&Wc, FBC, DWS, FC
Sacramento Wash	A&We, PBC
Saddle Canyon Creek	A&Wc, FBC, FC
Santa Fe Reservoir	A&Wc, FBC, DWS, FC
Santa Maria River	A&Ww, FBC, FC, AgI, AgL
Sapphire Creek	A&Ww, FBC, DWS, FC
Sawmill Wash	A&Ww, PBC, AgL
Serpentine Creek	A&Wc, PBC, DWS, FC
Shinumo Creek	A&Wc, FBC, DWS, FC
Short Creek	A&We, PBC
Slate Creek	A&Wc, FBC, DWS, FC
Spencer Canyon Creek	A&Wc, FBC, FC
Spring Canyon Creek	A&Wc, FBC, DWS, FC
Stone Creek	A&Wc, FBC, DWS, FC
Tapeats Creek	A&Wc, FBC, DWS, FC
Three Springs Creek	A&Wc, FBC, DWS, FC
Thunder River	A&Wc, FBC, DWS, FC, AgL
Topock Marsh	A&Ww, FBC, DWS, FC, AgI, AgL
Trail Canyon Creek	A&Wc, FBC, DWS, FC
Travertine Falls Creek	A&Wc, FBC, DWS, FC
Trout Creek	A&Ww, FBC, FC, AgL
Turquoise Creek	A&Wc, FBC, DWS, FC
Unkar Creek	A&Wc, FBC, DWS, FC
Unnamed Wash[1] (Grand Canyon, North Rim WWTP to 1 km downstream)	A&Wedw, PBC
Upper City Reservoir	A&Ww, FBC, FC
Vasey's Paradise	A&Wc, FBC, DWS, FC
Virgin River	A&Ww, FBC, FC, AgI, AgL
Vishnu Creek	A&Wc, FBC, DWS, FC
Warm Springs Creek	A&Ww, FBC, DWS
Wellton Canal	DWS, AgI, AgL
Wellton Ponds	A&Ww, FBC, FC
White Creek	A&Ww, FBC, DWS, FC
Wia Manua Park Lake	A&Ww, FBC, FC
YPG Pond	A&Ww, FBC, FC
Yuma Area Canals above municipal water treatment plant intakes	DWS, AgI, AgL
Yuma Area Canals below water treatment plant intakes and all drains	AgI, AgL
LITTLE COLORADO RIVER BASIN	
Antelope Lake	A&Ww, FBC, FC, AgI, AgL
Ashurst Lake	A&Wc, FBC, FC, AgI, AgL
Barbershop Canyon Creek	A&Wc, FBC, FC, AgL
Bear Canyon Creek (Tributary to Blue Ridge Reservoir)	A&Wc, FBC, FC, AgL
Bear Canyon Creek (Tributary to Willow Creek)	A&Wc, FBC, FC, AgL
Bear Canyon Lake	A&Wc, FBC, FC, AgI, AgL
Becker Lake	A&Wc, FBC, FC, AgL
Big Creek	A&Wc, FBC, FC, AgL
Black Canyon Creek	A&Wc, FBC, FC, AgI, AgL
Black Canyon Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Black Creek (New Mexico Border to Fort Defiance WWTP)	A&Ww, FBC, AgI, AgL

Navigable water	Designated Use
LITTLE COLORADO RIVER BASIN (cont.)	
Black Creek[1] (Fort Defiance WWTP to the Puerco River)	A&Wedw, PBC
Blue Ridge Reservoir	A&Wc, FBC, FC, AgI, AgL
Boot Lake	A&Ww, FBC, AgL
Buck Springs Canyon Creek	A&Wc, FBC, FC, AgL
Bunch Reservoir	A&Wc, FBC, FC, AgI, AgL
Camillo Tank	A&Ww, FBC, AgL
Carnero Lake	A&Wc, FBC, FC, AgL
Chevelon Canyon Lake	A&Wc, FBC, FC, AgI, AgL
Chevelon Creek	A&Wc, FBC, FC, AgI, AgL
Chevelon Creek, West Fork	A&Wc, FBC, FC, AgL
Chilson Tank	A&Ww, FBC, AgL
Cholla Lake	A&Ww, FBC, FC, AgL
Clear Creek	A&Wc, FBC, DWS, FC, A
Clear Creek Reservoir	A&Wc, FBC, FC, AgI,
Coconino Reservoir	A&Wc, FBC, FC, Ag
Colter Creek	A&Wc, FBC, FC, A
Colter Reservoir	A&Wc, FBC, FC
Concho Creek	A&Ww, FBC, F
Concho Lake	A&Wc, FBC
Cow Lake	A&Ww, FB
Coyote Creek	A&Wc, F
Crisis Lake (Snake Tank #2)	A&Ww
Dane Canyon Creek	A&W
Daves Tank	A&
Deep Lake	A
Dry Lake[1]	
East Clear Creek	&Wedw
Fish Creek	A&Wc, FBC, FC, AgI, AgL
Fool's Hollow Lake	A&Wc, FBC, FC
Ganado Lake	A&Wc, FBC, FC, AgL
General Springs Creek	A&Ww, FBC, FC, AgI
Hall Creek	A&Wc, FBC, FC, AgL
Hart Canyon Creek	A&Wc, FBC, FC, AgI, AgL
Hidden Lake	A&Wc, FBC, FC, AgL
Horse Lake	A&Ww, FBC, FC, AgI, AgL
Huffer Tank	A&Ww, FBC, AgL
Hulsey Creek	A&Ww, FBC, FC, AgL
Hulsey Lake	A&Wc, FBC, FC
Jack's Canyon Creek	A&Wc, FBC, FC
Kinnikinick Lake	A&Ww, FBC, FC, AgI, AgL
Knoll Lake	A&Wc, FBC, FC, AgL
Lake Humphreys[1]	A&Wc, FBC, FC, AgL
Lake Mary, lower	A&Wedw, PBC
Lake Mary, upper	A&Wc, FBC, FC, AgL
Lake of the Woods	A&Wc, FBC, DWS, FC, AgL
Lee Valley Creek	A&Wc, FBC, FC, AgI, AgL
Lee Valley Reservoir	A&Wc, FBC, FC, AgL
Leonard Canyon Creek	A&Wc, FBC, FC, AgI, AgL
Leonard Canyon Creek, East Fork	A&Wc, FBC, FC, AgL
Leonard Canyon Creek, Middle Fork	A&Wc, FBC, FC, AgL
Leonard Canyon Creek, West Fork	A&Wc, FBC, FC, AgL
Little Colorado River (below Lyman Reservoir)	A&Ww, FBC, DWS, FC, AgI, AgL
Little Colorado River (West Fork below Government Springs)	A&Wc, FBC, FC, AgI, AgL
Little Colorado River (West Fork above Government Springs)	A&Wc, FBC, FC
Little Colorado River, East Fork	A&Wc, FBC, FC, AgI, AgL
Little Colorado River, South Fork	A&Wc, FBC, FC, AgI, AgL
Little George Reservoir	A&Ww, FBC, FC, AgI
Little Mormon Lake	A&Ww, FBC, FC, AgI, AgL
Little Ortega Lake	A&Ww, FBC, FC
Long Lake, lower	A&Wc, FBC, FC, AgI, AgL
Long Lake, upper	A&Ww, FBC, AgL
Long Tom Tank	A&Wc, FBC, FC, AgL
Lower Walnut Canyon Lake[1]	A&Wedw, PBC
Lyman Reservoir	A&Wc, FBC, FC, AgI, AgL
Miamie Creek	A&Wc, FBC, FC, AgI, AgL

Navigable water	Designated Use
LITTLE COLORADO RIVER BASIN (cont.)	
Marshall Lake	A&Wc, FBC, FC, AgL
Merritt Draw Creek	A&Wc, FBC, FC, AgL
Mexican Hay Lake	A&Wc, FBC, FC, AgI, AgL
Milk Creek	A&Wc, FBC, FC
Miller Canyon Creek	A&Wc, FBC, FC, AgL
Miller Canyon Creek, East Fork	A&Wc, FBC, FC, AgL
Mineral Creek	A&Wc, FBC, FC, AgI, AgL
Mormon Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Morton Lake	A&Wc, FBC, FC, AgL
Mud Lake	A&Ww, FBC, AgL
Ned Lake[1]	A&Wedw, PBC,
Nelson Reservoir	A&Wc, FBC, FC, AgI, AgL
Nutrioso Creek	A&Wc, FBC, FC, AgI, AgL
Paddy Creek	A&Wc, FBC, FC
Pasture Canyon Lake	A&Ww, FBC, FC, AgL
Phoenix Park Wash	A&We, PBC
Pine Tank	A&Ww, FBC, AgL
Pintail Lake[1]	A&Wedw, PBC
Porter Creek	A&Wc, FBC, FC
Potato Lake	A&Wc, FBC, AgL
Pratt Lake	A&Wc, FBC, FC
Puerco River	A&Ww, FBC, AgI, AgL
Quarter Circle Bar Tank	A&Ww, FBC, AgL
Rainbow Lake	A&Wc, FBC, FC, AgI, AgL
Red Lake	A&Ww, FBC, FC, AgI
Rio de Flag[1]	A&Wedw, PBC
River Reservoir	A&Wc, FBC, FC, AgI, AgL
Rogers Reservoir	A&Ww, FBC, AgL
Russell Tank	A&Wc, FBC, FC, AgL
Sawmill Lakes	A&Ww, FBC, FC, AgI, AgL
Scott's Reservoir	A&Wc, FBC, FC, AgI, AgL
Show Low Creek	A&Wc, FBC, FC, AgI, AgL
Show Low Lake	A&Wc, FBC, FC, AgI, AgL
Silver Creek	A&Wc, FBC, FC, AgI, AgL
Soldiers Annex Lake	A&Wc, FBC, FC, AgI, AgL
Soldiers Lake	A&Wc, FBC, FC, AgI, AgL
Spaulding Tank	A&Ww, FBC, FC, AgL
Sponseller Lake	A&Ww, FBC
St. Johns Reservoir (Little Reservoir)	A&Ww, FBC, FC, AgI, AgL
Telephone Lake[1]	A&Wedw, PBC,
Trout Lake	A&Ww, FBC, FC, AgL
Tunnel Lake	A&Wc, FBC, FC, AgI, AgL
Turkey Creek	A&Wc, FBC, FC, AgL
Vail Lake	A&Wc, FBC, AgL
Walnut Creek	A&Wc, FBC, FC
Water Canyon Creek	A&Ww, FBC, FC, AgL
Whipple Lake	A&Ww, FBC, FC, AgL
White Mountain Lake	A&Wc, FBC, FC, AgI, AgL
White Mountain Reservoir	A&Wc, FBC, FC, AgI, AgL
Willow Creek	A&Wc, FBC, FC, AgL
Willow Springs Creek	A&Wc, FBC, FC, AgL
Willow Springs Lake	A&Wc, FBC, FC, AgI, AgL
Woodland Reservoir	A&Wc, FBC, FC, AgI, AgL
Woods Canyon Creek	A&Wc, FBC, FC
Woods Canyon Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Zuni River	A&Ww, FBC, AgI, AgL
MIDDLE GILA RIVER BASIN	
Agua Fria River (Above confluence with unnamed wash receiving treated wastewater from Prescott Valley WWTP)	A&We, PBC, AgI, AgL
Unnamed wash (From Prescott Valley WWTP to confluence with Agua Fria River)	A&Wedw, PBC
Agua Fria River (Below confluence with unnamed wash receiving treated wastewater from Prescott Valley WWTP to State Route 169)	A&Wedw, PBC, AgI, AgL
Agua Fria River (State Route 169 to Lake Pleasant)	A&Ww, FBC, DWS, FC, AgI, AgL

Navigable water	Designated Use
MIDDLE GILA RIVER BASIN (cont.)	
Agua Fria River (Lake Pleasant to the Surprise WWTP)	A&Ww, FBC, FC, AgI, AgL
Agua Fria River[1] (Surprise WWTP to Camelback Road)	A&Wedw, PBC
Agua Fria River (Camelback Road to Avondale WWTP)	A&Ww, PBC, AgI, AgL
Agua Fria River[1] (Avondale WWTP to Gila River confluence)	A&Wedw, PBC
Antelope Creek	A&Ww, PBC, AgI, AgL
Ash Creek	A&Ww, FBC, FC, AgI, AgL
Beehive Tank	A&Ww, FBC, AgL
Big Bug Creek	A&Ww, FBC, FC, AgI, AgL
Black Canyon Creek	A&Ww, FBC, AgI, AgL
Blind Indian Creek	A&Ww, FBC, FC, AgI, AgL
Cave Creek (Headwaters to Cave Creek Dam)	A&Ww, FBC, FC, AgL
Cave Creek (Cave Creek Dam to the Arizona Canal)	A&We, PBC
Centennial Wash	A&We, PBC
Centennial Wash Ponds	A&Ww, FBC, AgL
Galena Gulch	A&Ww, PBC, AgL
Gila River (Ashurst-Hayden Dam to the Florence WWTP)	A&Ww, FBC, FC, AgL
Gila River[1] (Florence WWTP to Felix Road)	A&Wedw, PBC
Gila River (Felix Road to the Salt River)	A&Ww, PBC, AgL
Gila River[1] (Salt River to the Gillespie Dam)	A&Wedw, PBC, FC, AgI, AgL
Gila River (Gillespie Dam to the Painted Rock Dam)	A&Ww, PBC, FC, AgI, AgL
Gila River (Painted Rock Dam to the Colorado River)	A&Ww, PBC, AgI, AgL
Groom Creek	A&Ww, FBC, DWS, FC,
Hank Raymond Lake	A&Ww, FBC, FC, AgI, AgL
Hassayampa Lake	A&Wc, FBC, DWS,
Hassayampa River (Headwaters to 8 miles south of Wickenburg)	A&Ww, FBC, FC, AgI, AgL
Hassayampa River (from 8 miles south of Wickenburg to the Buckeye Irrigation Company canal)	A&We, PBC
Hit Tank	A&Ww, FBC, AgL
Horsethief Basin Lake	A&Wc, FBC, DWS, FC, AgL
Lake Pleasant	A&Ww, FBC, FC, AgI, AgL
Little Ash Creek	A&Ww, FBC, FC, AgL
Lynx Creek	A&Ww, PBC, AgL
Lynx Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Martinez Creek	A&Ww, FBC, FC, AgI, AgL
New River	A&Ww, FBC, FC, AgI, AgL
Painted Rock Lake	A&Ww, FBC, AgI, AgL
Painted Rock Reservoir	A&Ww, FBC, FC, AgI, AgL
Perry Mesa Tank	A&Ww, FBC, AgL
Picacho Reservoir	A&Ww, FBC, FC, AgI, AgL
Queen Creek (Headwaters to the Superior WWTP)	A&Ww, PBC, DWS, AgL
Queen Creek[1] (Superior WWTP to Potts Canyon)	A&Wedw, PBC
Queen Creek (Below Potts Canyon)	A&Ww, PBC, AgL
Sycamore Creek	A&Wc, FBC, FC, AgL
Turkey Creek	A&Ww, FBC, AgI, AgL
Unnamed Wash[1] (Gila Bend WWTP to the Gila River)	A&Wedw, PBC
Unnamed Wash[1] (Luke Air Force Base WWTP to the Agua Fria River)	A&Wedw, PBC
Unnamed Wash[1] (Queen Valley WWTP to Queen Creek)	A&Wedw, PBC
RED LAKE BASIN	
Red Lake	A&Ww, FBC
Rock Canyon Creek	A&We, PBC
Truxton Wash	A&We, PBC
Wright Canyon Creek	A&We, PBC
RIO MAGDALENA BASIN	
Holden Canyon Creek	A&Ww, PBC
Sycamore Canyon Creek	A&Ww, FBC, AgL
RIO SONOITA BASIN	
San Simon Wash	A&We, PBC
Vamori Wash	A&We, PBC
RIO YAQUI BASIN	
Abbot Canyon	A&Ww, FBC, DWS, AgI, AgL
Blackwater Draw	A&Ww, FBC, DWS, AgI, AgL

Navigable water	Designated Use
RIO YAQUI BASIN (cont.)	
Buck Canyon	A&Ww, FBC, DWS, AgI, AgL
Dixie Canyon	A&Ww, FBC, DWS, AgI, AgL
Dry Canyon	A&Ww, FBC, DWS, AgI, AgL
Gadwell Canyon	A&Ww, FBC, DWS, AgI, AgL
Glance Creek	A&Ww, FBC, AgI, AgL
Gold Gulch	A&Ww, FBC, AgI, AgL
Johnson Canyon	A&Ww, FBC, DWS, AgI, AgL
Leslie Creek	A&Ww, FBC, DWS, FC, AgL
Mexican Canyon	A&Ww, FBC, DWS, AgI, AgL
Mule Gulch (Headwaters to Bisbee WWTP)	A&Ww, PBC, AgI, AgL
Mule Gulch[1] (Below Bisbee WWTP)	A&Wedw, PBC, AgL
Rucker Canyon Creek	A&Wc, FBC, DWS, FC, AgL
Rucker Canyon Lake	A&Wc, FBC, FC, AgL
Soto Canyon	A&Ww, FBC, DWS, AgI, AgL
Unnamed Wash[1] (Bisbee-Douglas International Airport WWTP to Whitewater Draw)	A&Wedw, PBC
Whitewater Draw	A&Ww, FBC, FC, AgI, AgL
SALT RIVER BASIN	
A-1 Lake	A&Wc, FBC, FC, AgI, AgL
Ackre (Judge) Lake	A&Wc, FBC, FC, AgI, AgL
Alvord Park Lake[3]	A&Ww, PBC, FC
Apache Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Arlington Canal (above Wilson Avenue)	AgL
B.S. Gap Tank	A&Ww, FBC, FC, AgL
Ball Tank	A&Ww, FBC, FC, AgL
Basin Creek	A&Wc, FBC, FC
Baskin Tank	A&Ww, FBC, FC, AgL
Bear Cienega Creek	A&Wc, FBC, FC
Bear Creek	A&Wc, FBC, FC, AgI, AgL
Bear Wallow Creek	A&Wc, FBC, FC, AgI, AgL
Bear Wallow Creek, North Fork	A&Wc, FBC, FC
Bear Wallow Creek, South Fork	A&Wc, FBC, FC
Beaver Creek	A&Wc, FBC, FC, AgI, AgL
Becker Creek	A&Wc, FBC, FC, AgI, AgL
Big Bonito Creek	A&Wc, FBC, FC, AgI, AgL
Big Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Black River	A&Wc, FBC, DWS, FC, AgI, AgL
Black River, East Fork	A&Wc, FBC, DWS, FC, AgI, AgL
Black River, North Fork of East Fork	A&Wc, FBC, DWS, FC, AgI, AgL
Black River, West Fork	A&Wc, FBC, DWS, FC, AgI, AgL
Bloody Tanks Wash (Headwaters to Schultze Ranch)	A&We, PBC, AgL
Bloody Tanks Wash (Schultze Ranch to Miami Wash)	A&We, PBC
Blue Lake	A&Wc, FBC, FC, AgL
Bobcat Tank	A&Ww, FBC, FC, AgL
Bog Creek	A&Wc, FBC, FC
Bog Tank	A&Wc, FBC, FC, AgI, AgL
Boggy Creek	A&Wc, FBC, FC, AgI, AgL
Boneyard Creek	A&Wc, FBC, FC, AgI, AgL
Bonsall Park Lake[3]	A&Ww, PBC, FC
Bootleg Lake	A&Wc, FBC, FC, AgI, AgL
Canal Park Lake[3]	A&Ww, PBC, FC
Canyon Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Canyon Lake	A&Wc, FBC, FC, AgI, AgL
Carrizo Creek	A&Wc, FBC, FC, AgI, AgL
Cedar Creek	A&Ww, FBC, AgI, AgL
Centerfire Creek	A&Wc, FBC, FC, AgI, AgL
Chambers Draw Creek	A&Wc, FBC, FC
Chaparral Park Lake[3]	A&Ww, PBC, FC, AgI
Cherry Creek	A&Wc, FBC, FC, AgI, AgL
China Tank	A&Ww, FBC, FC, AgI, AgL
Christmas Tree Lake	A&Wc, FBC, FC, AgI, AgL
Christopher Creek	A&Wc, FBC, FC, AgI, AgL
Cibecue Creek	A&Wc, FBC, FC, AgI, AgL
Clover Tank	A&Ww, FBC, FC, AgL

Navigable water	Designated Use
SALT RIVER BASIN (cont.)	
Cold Springs Canyon Creek	A&Ww, FBC, FC
Conklin Creek	A&Wc, FBC, FC, AgI, AgL
Cooley Lake	A&Wc, FBC, FC, AgI, AgL
Coon Creek	A&Ww, FBC
Corduroy Creek	A&Wc, FBC, FC, AgI, AgL
Corn Tank	A&Ww, FBC, FC, AgI, AgL
Cortez Park Lake[3]	A&Ww, PBC, FC, AgI
Coyote Creek	A&Wc, FBC, FC, AgI, AgL
Crescent Lake	A&Wc, FBC, FC, AgI, AgL
Crooked Creek	A&Wc, FBC, FC, AgI, AgL
Cyclone Lake	A&Wc, FBC, FC, AgI, AgL
Deep Creek	A&Wc, FBC, FC, AgI, AgL
Deer Creek	A&Wc, FBC, FC
Deer Tank	A&Ww, FBC, FC, AgI, AgL
Desert Breeze Lake[3]	A&Ww, PBC, FC
Devil's Chasm Creek	A&Wc, FBC, FC
Diamond Creek	A&Wc, FBC, FC, AgI, AgL
Dobson Lake[3]	A&Ww, PBC, FC
Double Cienega Creek	A&Wc, FBC, FC
Drift Fence Lake	A&Wc, FBC, FC, AgI, AgL
Earl Creek	A&Wc, FBC, FC, AgI, AgL
Earl Park Lake	A&Ww, FBC, FC, AgI, AgL
East Bonito Praire Tank	A&Ww, FBC, FC, AgL
East Deer Tank	A&Ww, FBC, FC, AgL
Eldorado Park Lake[3]	A&Ww, PBC, FC
Elwood Tank	A&Ww, FBC, FC, AgL
Encanto Park Lake[3]	A&Ww, PBC, FC, AgI
Fish Creek	A&Wc, FBC, FC, AgI, AgL
Flash Creek	A&Wc, FBC, FC, AgI, AgL
George's Basin Lake	A&Ww, FBC, FC, AgI, AgL
Glade Tank	A&Ww, FBC, FC, AgL
Gold Creek	A&Ww, FBC
Gomez Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Gooseberry Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Gordon Canyon Creek	A&Ww, FBC, FC
Granada Park Lake[3]	A&Ww, PBC, FC
Haigler Creek	A&Wc, FBC, FC, AgI, AgL
Halfway Tank	A&Ww, FBC, FC, AgL
Hannagan Creek	A&Wc, FBC, FC, AgL
Hawley Lake	A&Wc, FBC, FC, AgI, AgL
Hay Creek	A&Wc, FBC, FC
Herrington Tank	A&Ww, FBC, FC, AgL
Highway Tank	A&Ww, FBC, FC, AgL
Home Creek	A&Wc, FBC, FC
Horse Creek	A&Wc, FBC, FC
Horseshoe Cienega Lake	A&Wc, FBC, FC, AgI, AgL
Horseshoe Creek	A&Wc, FBC, FC
Horton Creek	A&Wc, FBC, FC, AgI, AgL
Houston Creek	A&Ww, FBC, FC, AgL
Hunter Creek	A&Wc, FBC, FC, AgL
Hurricane Creek	A&Wc, FBC, FC
Hurricane Lake	A&Wc, FBC, FC, AgI, AgL
Indian Bend Wash	A&Ww, PBC, FC
Indian Bend Wash Lakes[3]	A&Ww, PBC, FC
Indian School Park Lake[3]	A&Ww, PBC, FC
Kiwanis Park Lake[3]	A&Ww, PBC, FC, AgI
Lake Sierra Blanca	A&Wc, FBC, FC, AgI, AgL
Little Bonito Creek	A&Wc, FBC, FC, AgI, AgL
Little Diamond Creek	A&Wc, FBC, FC, AgI, AgL
Lofer Cienega Creek	A&Wc, FBC, FC, AgI, AgL
Lost Basin Tank	A&Ww, FBC, FC, AgL
Lost Mule Tank	A&Ww, FBC, FC, AgL
Martin Luther Tank	A&Ww, FBC, FC, AgL
McDonald Tank	A&Ww, FBC, FC, AgL
McKellips Park Lake[3]	A&Ww, PBC, FC, AgI

Navigable water	Designated Use
SALT RIVER BASIN (cont.)	
McNary Mill Pond	A&Wc, FBC, DWS, FC, AgI, AgL
Miami Wash	A&We, PBC
Moon Creek	A&Wc, FBC, FC, AgI, AgL
Morman Tank	A&Ww, FBC, FC, AgL
Mule Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Nash Creek Reservoir	A&Wc, FBC, FC, AgI, AgL
Navajo Pit Tank	A&Ww, FBC, FC, AgI, AgL
North Bonito Praire Tank	A&Ww, FBC, FC, AgL
Open Draw Creek	A&Wc, FBC, FC
Ord Creek	A&Wc, FBC, FC, AgI, AgL
Pacheta Creek	A&Wc, FBC, FC, AgI, AgL
Pacheta Lake	A&Wc, FBC, FC, AgI, AgL
Paddy Creek	A&Wc, FBC, FC, AgL
Papago Park Ponds[3]	A&Ww, PBC, FC
Paradise Creek	A&Wc, FBC, FC, AgI, AgL
Perry Creek	A&Wc, FBC, FC, AgL
Phillips Park Tank	A&Ww, FBC, FC, AgL
Phoenix Area Canals (Granite Reef Dam to municipal WTP)	DWS, AgI, AgL
Phoenix Area Canals (Below WTP intakes and all other locations)	AgI, AgL
Pickett Corral Tank	A&Ww, FBC, FC, AgL
Pinal Creek (Headwaters to Globe WWTP)	A&We, FBC, AgI, AgL
Pinal Creek[1] (Globe WWTP to Radium)	A&Ww, PBC
Pinal Creek (Radium to Setka Ranch)	A&We, PBC, AgI, AgL
Pinal Creek (Setka Ranch to the Salt River)	A&Ww, FBC, FC, AgI, AgL
Pinto Creek	A&Ww, FBC, FC, AgI, AgL
Pole Corral Tank	A&Ww, FBC, FC, AgL
Powerline Tank	A&Ww, FBC, AgL
Pueblo Canyon Creek	A&Wc, FBC, FC, AgL
Reservation Creek	A&Wc, FBC, FC, AgI, AgL
Reservation Lake	A&Wc, FBC, FC, AgI, AgL
Reynolds Creek	A&Wc, FBC, FC, AgL
Riverview Lake[3]	A&Ww, PBC, FC
Roadrunner Park Lake[3]	A&Ww, PBC, FC
Roosevelt Lake	A&Ww, FBC, DWS, FC, AgI, AgL
Rye Creek	A&Ww, FBC, FC, AgL
Saguaro Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Salome Creek	A&Wc, FBC, FC, AgI, AgL
Salt River (Above Roosevelt Lake)	A&Ww, FBC, FC, AgI, AgL
Salt River (Stewart Mountain Dam to the Verde River)	A&Wc, FBC, DWS, FC, AgI, AgL
Salt River (Verde River to 2 km below Granite Reef Dam)	A&Wc, FBC, FC, AgI, AgL
Salt River (2 km below Granite Reef Dam to the I-10 bridge)	A&Ww, FBC, FC, AgI, AgL
Salt River (I-10 bridge to the 23rd Avenue WWTP)	A&Wc, FBC, DWS, FC, AgI, AgL
Salt River[1] (23rd Avenue WWTP to the Gila River confluence)	A&Ww, FBC, DWS, FC, AgI, AgL
Sand Creek	A&We, PBC
Sawmill Creek	A&Ww, PBC
Sawmill Tank	A&Wedw, PBC, FC, AgI, AgL
Seneca Lake	A&Wc, FBC, FC, AgI, AgL
Shush Be Tou Lake	A&Ww, FBC, AgI, AgL
Shush Bezahze Lake	A&Ww, FBC, FC, AgL
Slate Creek	A&Ww, FBC, FC
Snake Creek	A&Wc, FBC, FC, AgI, AgL
Soldier Creek	A&Wc, FBC, FC, AgI, AgL
Spring Creek	A&Ww, PBC, FC, AgL
Spur Tank	A&Wc, FBC, FC, AgI, AgL
Squaw Creek	A&Wc, FBC, FC
Steele Tank	A&Wc, FBC, FC, AgL
Stinky Creek	A&Ww, FBC, FC, AgL
Stove Tank	A&Wc, FBC, FC, AgI, AgL
Sun Creek	A&Ww, FBC, FC, AgL
Sunrise Lake	A&Wc, FBC, FC
Sycamore Tank	A&Ww, FBC, FC, AgL
Tank Canyon Tank	A&Wc, FBC, FC, AgI, AgL
Tinajas Creek	A&Wc, FBC, FC, AgI, AgL
Thompson Creek	A&Ww, FBC, FC, AgL
Tonto Creek	A&Ww, FBC, FC, AgL
	A&Wc, FBC, FC, AgL
	A&Wc, FBC, FC
	A&Wc, FBC, FC, AgI, AgL

Navigable water	Designated Use
SALT RIVER BASIN (cont.)	
Tonto Lake	A&Wc, FBC, FC, AgI, AgL
Trout Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Turkey Creek	A&Ww, FBC, FC
Tuttle Tank	A&Ww, FBC, FC, AgL
Upper Corn Creek Tank	A&Ww, FBC, FC, AgL
Upper Highway Tank	A&Ww, FBC, FC, AgL
Vista Del Camino Park North[3]	A&Ww, PBC, FC
Vista Del Camino Park South[3]	A&Ww, PBC, FC
Weaning Pen Tank	A&Ww, FBC, FC, AgI, AgL
White River	A&Wc, FBC, FC, AgI, AgL
White River, East Fork	A&Wc, FBC, FC, AgI, AgL
White River, North Fork	A&Wc, FBC, DWS, FC, AgI, AgL
Wild Steer Tank	A&Ww, FBC, FC, AgL
Wildcat Creek	A&Wc, FBC, FC
Williams Creek	A&Wc, FBC, FC, AgI, AgL
Willow Creek	A&Wc, FBC, FC
Workman Creek	A&Wc, FBC, DWS, FC, AgI, AgL
SAN JUAN RIVER BASIN	
Chinle Wash	A&Ww, FBC, AgL
Laguna Creek	A&Ww, FBC, FC, AgI, AgL
Many Farms Reservoir	A&Ww, FBC, FC, AgI
Round Rock Lake	A&Ww, FBC, FC, AgI
Tsaile Creek	A&Ww, FBC, FC, AgL
Tsaile Lake	A&Wc, FBC, FC, AgI
Walker Creek	A&Ww, FBC, AgI, AgL
Wheatfields Creek	A&Ww, FBC, FC, AgL
Wheatfields Lake	A&Wc, FBC, FC, AgI
Whiskey Creek	A&Ww, FBC, FC, AgL
SAN PEDRO RIVER BASIN	
Aravaipa Creek	A&Ww, FBC, DWS, FC, AgL
Babocomari Creek	A&Ww, FBC, FC, AgL
Bass Canyon Tank	A&Ww, FBC, FC, AgL
Blacktail Pond	A&Ww, FBC, FC
Buehman Canyon Creek	A&Ww, FBC, AgL
Bull Tank	A&Ww, FBC, FC, AgL
Carr Canyon Creek	A&Wc, FBC, FC, AgL
Copper Creek	A&Ww, PBC, AgI, AgL
East Gravel Pit Pond	A&Ww, FBC, FC
Fly Pond	A&Ww, FBC, FC
Garden Canyon Creek	A&Ww, FBC, DWS, AgI
Golf Course Pond	A&Ww, FBC, FC
Gravel Pit Pond	A&Ww, FBC, FC
Hidden Pond	A&Ww, FBC, FC
Hotsprings Canyon Creek	A&Ww, FBC, FC, AgL
Lower Garden Canyon Pond	A&Ww, FBC, FC
Miller Canyon Creek	A&Wc, FBC, FC, AgL
Officers Club Pond	A&Ww, FBC, FC
Ramsey Canyon Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Redfield Canyon Creek	A&Ww, FBC, FC, AgL
San Pedro River (Mexican border to Redington)	A&Ww, FBC, FC, AgI, AgL
San Pedro River (Redington to the Gila River)	A&Ww, FBC, AgL
Sycamore Pond I	A&Ww, FBC, FC
Sycamore Pond II	A&Ww, FBC, FC
Turkey Creek	A&Ww, FBC, AgI, AgL
Unnamed Wash (Oracle WWTP to Big Wash)	A&Wedw, PBC
Walnut Gulch (Tombstone WWTP to the San Pedro River)	A&Wedw, PBC
Woodcutters Pond	A&Ww, FBC, FC
SANTA CRUZ RIVER BASIN	
Agua Caliente Wash	A&Ww, FBC, AgL
Asarre Wash	A&We, PBC
Alambre Wash	A&We, PBC
Alamo Wash	A&We, PBC

Navigable water	Designated Use
SANTA CRUZ RIVER BASIN (cont.)	
Altar Wash	A&We, PBC
Alum Gulch	A&We, PBC
Arivaca Creek	A&Ww, FBC, AgL
Arivaca Lake	A&Ww, FBC, FC, AgI, AgL
Atterbury Wash	A&We, PBC
Bear Grass Tank	A&Ww, FBC, FC, AgL
Big Wash	A&We, PBC
Bog Hole Tank	A&Ww, FBC, AgL
Brawley Wash	A&We, PBC
Cañada del Oro (Headwaters to Highway 89)	A&Ww, FBC, DWS, FC, AgI, AgL
Cañada del Oro (Below Highway 89)	A&We, PBC, AgI, AgL
Cienega Creek (Headwaters to I-10)	A&Ww, FBC, AgL
Cienega Creek[2] (I-10 to Del Lago dam)	A&Ww, FBC, AgL
Cienega Creek (Below Del Lago dam)	A&Ww, FBC, AgL
Davidson Canyon (Headwaters to I-10)	A&We, PBC
Davidson Canyon (I-10 to Cienega Creek)	A&Ww, FBC, AgL
Empire Gulch (Headwaters to Empire Ranch Spring)	A&We, PBC
Empire Gulch (Below Empire Ranch Spring)	A&Ww, FBC, AgL
Fagen Tank	A&Ww, FBC, FC, AgL
Flux Canyon	A&We, PBC
Gardner Canyon Creek	A&Ww, FBC
Greene Wash	A&We, PBC
Harshaw Wash	A&Ww, PBC, AgL
Huachuca Tank	A&w, FBC, AgL
Julian Wash	A&We, PBC
Lemmon Canyon Creek	&Wc, FBC, FC
Los Robles Wash	A&We, PBC
Madera Canyon Creek	A&Ww, FBC, FC
Nogales Wash	A&Ww, PBC, AgI, AgL
Oak Tree Canyon	A&We, PBC
Palisade Canyon Creek	A&Wc, FBC, FC
Pantano Wash	A&We, PBC
Parker Canyon Creek	A&Ww, PBC, FC
Parker Canyon Lake	A&Wc, FBC, FC, AgI, AgL
Patagonia Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Pena Blanca Lake	A&Wc, FBC, FC, AgI, AgL
Puertocito Wash	A&We, PBC
Redrock Canyon Creek	A&Ww, FBC, FC
Rillito Creek	A&We, PBC, AgL
Romero Canyon Creek	A&Wc, FBC, FC
Rose Canyon Creek	A&Ww, FBC, FC
Rose Canyon Lake	A&Wc, FBC, FC, AgI, AgL
Sabino Canyon Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Salero Ranch Tank	A&Ww, FBC, FC, AgL
Santa Cruz River (Headwaters to the International Boundary)	A&Ww, FBC, FC, AgI, AgL
Santa Cruz River (International Boundary to Nogales WWTP)	A&Ww, DWS, FBC, AgI, AgL
Santa Cruz River[1] (Nogales WWTP to Tubac)	A&Wedw, PBC
Santa Cruz River (Tubac to the Roger Rd WWTP)	A&We, PBC, AgL
Santa Cruz River[1] (Roger Rd WWTP to Baumgartner Rd)	A&Wedw, PBC
Santa Cruz River (Wash) (Baumgartner Rd to the Gila River Reservation)	A&We, PBC, AgL
Santa Cruz River (Wash) (Gila River Reservation to the Gila River)	A&Ww, FBC, AgI, AgL
Santa Cruz River, West Branch	A&We, PBC
Santa Cruz Wash, N. Branch[1] (Casa Grande WWTP to the Santa Cruz River)	A&Wedw, PBC
Santa Rosa Wash	A&We, PBC
Soldier Lake	A&Wc, FBC, AgI, AgL
Sonoita Creek (Above the town of Patagonia)	A&Ww, PBC, AgI, AgL
Sonoita Creek (Below the town of Patagonia)	A&Ww, FBC, FC, AgI, AgL
Split Tank	A&Ww, FBC, FC, AgL
Stock Tank	A&Ww, FBC, AgL
Sutherland Wash	A&We, PBC
Sycamore Spring Reservoir	A&Wc, FBC, FC
Tanque Verde Creek	A&Ww, FBC, AgL
The Lake Tank	A&Ww, FBC, FC, AgL
Tinaja Wash	A&Ww, PBC, AgL

Navigable water	Designated Use
SANTA CRUZ RIVER BASIN (cont.)	
Vekol Wash	A&We, PBC
Williams Ranch Tanks	A&Ww, FBC, AgL
UPPER GILA RIVER BASIN	
Apache Creek	A&Ww, FBC, AgL
Armstrong Tank	A&Ww, FBC, FC, AgL
Arrowhead Tank	A&Ww, FBC, FC, AgL
Arsenic Tub	A&Ww, FBC, FC
Ash Creek	A&Ww, FBC, FC, AgL
Barlow Pass Tank	A&Ww, FBC, FC, AgL
Bennet Wash[1] (Arizona Department of Corrections-Safford WWTP to the Gila River)	A&Wedw, PBC
Big Bonita Tank	A&Ww, FBC, FC, AgL
Big Brushy Tank	A&Ww, FBC, FC, AgL
Bitter Creek	A&Ww, PBC
Bloody Basin Tank	A&Ww, FBC, FC, AgL
Blue River	A&Wc, FBC, FC, AgL, AgL
Boni Tank	A&Ww, FBC, FC, AgL
Bonita Creek[2]	A&Ww, FBC, DWS, FC, AgL
Brushy Basin Tank	A&Ww, FBC, FC, AgL
Buckalou Creek	A&Wc, FBC, FC
Burdette Tank	A&Ww, FBC, FC, AgL
Cammerman Wash[1] (Arizona Department of Corrections-Globe WWTP to 3 km downstream)	A&Wedw, PBC
Campbell Blue Creek	A&Wc, FBC, FC
Castle Creek	A&Wc, FBC, FC
Cave Creek and Ponds	A&Wc, FBC, FC, AgL, AgL
Chapman Tank	A&Ww, FBC, FC, AgL
Chase Creek	A&Ww, PBC, AgL
Chitty Canyon Creek	A&Wc, FBC, FC
Cluff Ranch Pond #1	A&Ww, FBC, FC, AgL, AgL
Cluff Ranch Pond #2	A&Ww, FBC, FC, AgL, AgL
Cluff Ranch Pond #3	A&Ww, FBC, FC, AgL, AgL
Coleman Creek	A&Wc, FBC, FC
Cox Corral Tank	A&Ww, FBC, FC, AgL
Dankworth Lake	A&Wc, FBC, FC
Deadman Canyon Creek	A&Wc, FBC, DWS, FC, AgL
Deadman Tank	A&Ww, FBC, FC, AgL
Dry Lake	A&Ww, FBC, FC, AgL
Dry Prong Tank	A&Ww, FBC, FC, AgL
Eagle Creek	A&Wc, FBC, DWS, FC, AgL, AgL
East Eagle Creek	A&Wc, FBC, FC, AgL
East Salt Shed Tank	A&Ww, FBC, FC, AgL
East Shortline Tank	A&Ww, FBC, FC, AgL
Evans Pond	A&Ww, FBC
Foote Creek	A&Ww, FBC, FC
Four Mile Tank	A&Ww, FBC, FC, AgL
Frye Creek	A&Wc, FBC, FC, AgL
Frye Mesa Reservoir	A&Wc, FBC, DWS, FC
Geronimo Tank (Concrete)	A&Ww, FBC, FC, AgL
Geronimo Tank (Earth Dam)	A&Ww, FBC, FC, AgL
Gibson Creek	A&Wc, FBC, FC, AgL, AgL
Gila River (New Mexico border to San Carlos Lake)	A&Ww, FBC, FC, AgL, AgL
Gila River (San Carlos Lake to San Pedro River)	A&Ww, FBC, FC, AgL
Gila River (San Pedro River to Mineral Creek)	A&Ww, FBC, FC, AgL, AgL
Gila River (Mineral Creek to Ashurst-Hayden Dam)	A&Ww, FBC, FC, AgL, AgL
Gimme Tank	A&Ww, FBC, FC, AgL
Grant Creek	A&Wc, FBC, FC
Green Mountain Tank	A&Ww, FBC, FC, AgL
Headquarters Tank	A&Ww, FBC, FC, AgL
Homer A. Tank	A&Ww, FBC, FC, AgL
IDT Tank	A&Ww, FBC, FC, AgL
Juniper Tank	A&Ww, FBC, FC, AgL
K-P Creek	A&Wc, FBC, DWS, FC, AgL
Kidde Tank	A&Ww, FBC, FC, AgL

Navigable water	Designated Use
UPPER GILA RIVER BASIN (cont.)	
Lasley Tank	A&Ww, FBC, FC, AgL
Little Creek	A&Wc, FBC, FC
Loafer Tank	A&Ww, FBC, FC, AgL
Lower Georges Reservoir	A&Wc, FBC, FC, AgL
Luna Lake	A&Wc, FBC, FC, AgL
Maggie Jones Tank	A&Ww, FBC, FC, AgL
Marijilda Creek	A&Wc, FBC, FC, AgI, AgL
Markham Creek	A&Ww, FBC, AgL
Mineral Creek	A&Ww, FBC, FC, AgL
Nine Mile Tank	A&Ww, FBC, FC, AgL
Pigeon Creek	A&Ww, FBC, AgL
Pima Gap Tank	A&Ww, FBC, FC, AgL
Pine Flat Tank	A&Ww, FBC, FC, AgL
Point of Pines Lake	A&Ww, FBC, FC
Point-O-Pines Charco Tank	A&Ww, FBC, FC, AgL
Prairie Tank	A&Ww, FBC, FC, AgL
Raspberry Creek	A&Ww, FBC, FC
Riggs Reservoir	A&Ww, FBC, FC, AgL
Rodeo Tank	A&Ww, FBC, FC, AgL
Roper Lake	A&Ww, FBC, FC
Salt Creek Tank	A&Ww, FBC, FC, AgL
Salt Shed Tank	A&Ww, FBC, FC, AgL
San Carlos Lake	A&Ww, FBC, FC, AgL, AgL
San Carlos River	A&Ww, FBC, FC
San Francisco River (Headwaters to New Mexico border)	A&Wc, FBC, FC, AgI, AgL
San Francisco River (New Mexico border to the Gila River)	A&Ww, FBC, FC, AgI, AgL
San Simon River	A&Ww, PBC, AgI, AgL
Seven Mile Tank	A&Ww, FBC, FC, AgL
Sheep Tank	A&Ww, FBC, FC, AgL
Shortline Tank	A&Ww, FBC, FC, AgL
Slaughter Camp Tank	A&Ww, FBC, FC, AgL
Smith Pond	A&Ww, FBC, FC
Soldier Hole Tank	A&Ww, FBC, FC, AgL
South Headquarters Tank	A&Ww, FBC, FC, AgL
South Summit Tank	A&Ww, FBC, FC, AgL
Stone Creek	A&Wc, FBC, FC, AgI, AgL
Strayhorse Creek	A&Wc, FBC, FC
Summit Tank	A&Ww, FBC, FC, AgL
Sweetmeat Tank	A&Ww, FBC, FC, AgL
Talkali Lake	A&Ww, FBC, FC, AgI
Tarantula Tank	A&Ww, FBC, FC, AgL
Tinny Pond	A&Ww, FBC, FC, AgL
Turkey Creek	A&Wc, FBC, FC, AgI, AgL
Turkey Roost Tank	A&Ww, FBC, FC, AgL
Turtle Tank	A&Ww, FBC, FC, AgL
University Charco Tank	A&Ww, FBC, FC, AgL
Upper Cienega Tank	A&Ww, FBC, FC, AgL
Walnut Canyon Creek	A&Ww, FBC, FC
White Canyon Creek	A&Ww, FBC, FC
VERDE RIVER BASIN	
American Gulch (Headwaters to the Payson WWTP)	A&Ww, FBC, FC, AgI, AgL
American Gulch[1] (Payson WWTP to the East Verde River)	A&Wedw, PBC
Aspen Creek	A&Ww, PBC
Bar Cross Tank	A&Ww, FBC, FC, AgL
Barrata Tank	A&Ww, FBC, AgL
Bartlett Lake	A&Ww, FBC, DWS, FC, AgI, AgL
Beaver Creek	A&Wc, FBC, FC, AgL
Bitter Creek (Headwaters to the Jerome WWTP)	A&Ww, PBC, AgL
Bitter Creek[1] (Jerome WWTP to 2.5 km downstream)	A&Wedw, PBC
Bitter Creek (Below 2.5 km downstream of the Jerome WWTP)	A&Ww, FBC, AgI, AgL
Bonita Creek	A&Wc, FBC, DWS, FC
Bray Creek	A&Ww, FBC, FC, AgL
Carter Tank	A&Ww, FBC, FC, AgL
Cement Dam Lake	A&Wc, FBC, FC, AgI, AgL

Navigable water	Designated Use
VERDE RIVER BASIN (cont.)	
Chase Creek	A&Wc, FBC, DWS, FC
Dead Horse Lake	A&Wc, FBC, FC
Deadman Creek	A&Ww, FBC, FC, AgL
Del Rio Dam Lake	A&Ww, FBC, FC, AgL
Dry Beaver Creek	A&Ww, FBC, FC, AgI, AgL
Dude Creek	A&Wc, FBC, FC, AgI, AgL
East Verde River	A&Wc, FBC, DWS, FC, AgI, AgL
El Paso Tank	A&Ww, FBC, FC, AgL
Ellison Creek	A&Wc, FBC, FC, AgL
Fossil Creek	A&Ww, FBC, FC, AgI, AgL
Fossil Springs	A&Ww, FBC, DWS
Foxboro Lake	A&Ww, FBC, AgL
Fry Lake	A&Ww, FBC, FC, AgL
Gap Creek	A&Wc, FBC, FC, AgL
Garrett Tank	A&Ww, FBC, FC, AgL
Goldwater Lake	A&Wc, FBC, DWS, FC
Granite Basin Lake	A&Ww, FBC, FC, AgI, AgL
Granite Creek	A&Ww, FBC, AgL
Heifer Tank	A&Ww, FBC, FC, AgL
Hell Canyon Tank	A&Ww, PBC, FC, AgL
Homestead Tank	A&Ww, FBC, FC, AgL
Horse Park Tank	A&Ww, FBC, AgL
Horseshoe Lake	A&Ww, FBC, FC, AgI, AgL
Jacks Canyon Wash[1] (Big Park WWTP to Dry Beaver Creek)	A&Wedw, PBC
J.D. Dam Lake	A&Wc, FBC, FC, AgI, AgL
McLellan Reservoir	A&Ww, FBC, FC, AgI, AgL
Meath Dam Tank	A&Ww, FBC, AgL
Mullican Tank	A&Ww, FBC, FC, AgL
Oak Creek[2]	A&Wc, FBC, DWS, FC, AgI, AgL
Oak Creek, West Fork[2]	A&Wc, FBC, FC, AgL
Peck's Lake	A&Wc, FBC, FC, AgI, AgL
Perkins Lake	A&Wc, FBC, FC, AgL
Pine Creek	A&Wc, FBC, DWS, FC, AgI, AgL
Red Lake	A&Ww, FBC, FC, AgL
Reservoir #1	A&Ww, FBC, FC
Reservoir #2	A&Ww, FBC, FC
Scholze Lake	A&Ww, FBC, FC, AgL
Spring Creek	A&Ww, FBC, FC, AgI, AgL
Steel Dam Lake	A&Ww, FBC, FC, AgL
Stehr Lake	A&Ww, FBC, FC, AgL
Stoneman Lake	A&Wc, FBC, FC, AgI, AgL
Sullivan Lake	A&Ww, FBC, FC, AgI, AgL
Sycamore Creek (Coconino Forest)	A&Wc, FBC, FC, AgI, AgL
Sycamore Creek (Tonto Forest)	A&Ww, FBC, FC, AgI, AgL
Tangle Creek	A&Ww, FBC, FC, AgI, AgL
Trinity Tank	A&Ww, FBC, FC, AgL
Verde River (Above Bartlett Dam)	A&Ww, FBC, FC, AgI, AgL
Verde River (Below Bartlett Dam)	A&Ww, FBC, DWS, FC, AgI, AgL
Watson Lake	A&Ww, FBC, FC, AgI, AgL
Webber Creek	A&Wc, FBC, FC, AgL
West Clear Creek	A&Wc, FBC, FC, AgL
Wet Beaver Creek	A&Wc, FBC, FC, AgI, AgL
Whitehorse Lake	A&Wc, FBC, DWS, FC, AgI, AgL
Williscraft Lake	A&Ww, FBC, FC, AgL
Willow Creek	A&Wc, FBC, FC, AgL
Willow Lake	A&Ww, FBC, FC, AgI, AgL
Willow Valley Lake	A&Ww, FBC, AgL
WILLCOX PLAYA	
Ash Creek	A&Wc, FBC, FC, AgI, AgL
Big Canyon Creek	A&Ww, FBC, FC, AgL
Grant Creek	A&Wc, FBC, DWS, FC, AgL
High Creek	A&Ww, FBC
Moonshine Creek	A&Wc, FBC, FC, AgL
Pinery Creek	A&Ww, FBC, DWS, FC

Navigable water	Designated Use
WILLCOX PLAYA (cont.)	
Post Creek	A&Wc, FBC, FC, AgI, AgL
Riggs Flat Lake	A&Wc, FBC, FC, AgI, AgL
Rock Creek	A&Ww, FBC, FC, AgL
Snow Flat Lake	A&Wc, FBC, FC, AgI, AgL
Soldier Creek	A&Wc, FBC, FC, AgL
Willcox Playa	A&Ww, FBC, AgL

ABBREVIATIONS:

A&Wc	=	Aquatic and Wildlife (cold water fishery).
A&We	=	Aquatic and Wildlife (ephemeral).
A&Wedw	=	Aquatic and Wildlife (effluent dominated water).
A&Ww	=	Aquatic and Wildlife (warm water fishery).
AgL	=	Agricultural Livestock Watering.
AgI	=	Agricultural Irrigation.
DWS	=	Domestic Water Source.
FBC	=	Full Body Contact.
PBC	=	Partial Body Contact.
FC	=	Fish Consumption.
WTP	=	Water Treatment Plant.
WWTP	=	Wastewater Treatment Plant.

NOTES:

1 = An effluent dominated water.

2 = A unique water: Limits developed on a site-specific basis for each stream segment or lake. See R18-11-112 for applicable criteria.

3 = Municipal Park Lake.

Historical Note
Adopted effective February 18, 1992 (Supp. 92-1).

PARAMETER	PQLs (µg/L)
Acenaphthylene	10
Acrylonitrile	5
Aldrin	0.05
Anthracene	10
Antimony	5
Arsenic	10
Benzidine	20
Benzo (a) anthracene	10
Benzo (a) pyrene	6
Benzo (ghi) perylene	10
Benzo (k) fluoranthene	10
3,4-Benzofluoranthene	10
Beryllium	0.5
BHC-alpha	0.0
BHC-beta	.05
BHC-gamma (lindane)	0.05
Bis(2-chloroethyl) ether	10
Bis-(2-ethylhexyl) phthalate	10
Chlordane	0.1
Chlorodibromomethane	1
3-methyl-4-chlorophenol	5
Chrysene	10
Cyanide	20
DDD	0.1
DDE	0.1
DDT	0.1
Dibenzo (ah) anthracene	10
3,3-Dichlorobenzidine	20
Dichlorobromomethane	0.5
1,3-Dichloropropene	0.5
Dieldrin	0.1
2,4-Dinitrophenol	50
2-methyl-4,6-Dinitrophenol	50
2,4-Dinitrotoluene	10
2,3,7,8-TCDD (Dioxin)	0.005
Endosulfan sulfate	0.2
Endosulfan-alpha	0.1
Endosulfan-beta	0.05
Endrin	0.1
Endrin aldehyde	0.2
Fluorene	10
Heptachlor	0.05
Heptachlor epoxide	0.1
Hexachlorobenzene	0.5
Hexachlorobutadiene	5
Hexachlorocyclopentadiene	5
Indene (1,2,3-cd) pyrene	10
Mercury	0.5
N-nitrosodimethylamine	10
N-nitrosodi-n-propylamine	10
PCBs	0.5
Phenanthrene	10
Pyrene	10
Selenium	5
Silver	1
Sulfides	10000
1,1,2,2-Tetrachloroethane	5
Toxaphene	2
2,4,6-Trichlorophenol	5

µg/L - micrograms per liter

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria							
PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
Acenaphthene	83-32-9	420	2600	8400	8400	NNS	NNS
Acenaphthylene	208-96-8	NNS	NNS	NNS	NNS	NNS	NNS
Acrolein	107-02-8	110	750	2200	2200	NNS	NNS
Acrylonitrile	107-13-1	0.06	0.64	2.6	NNS	NNS	NNS
Alachlor	15972-60-8	2	NNS	1400	1400	NNS	NNS
Aldrin	309-00-2	0.002	0.0003	0.08	4.2	k	k
Ammonia	7664-41-7	NNS	NNS	NNS	NNS	NNS	NNS
Anthracene	120-12-7	2100	6300	42000	42000	NNS	NNS
Antimony (as Sb)	7440-36-0	6 T	140 T	56 T	56 T	NNS	NNS
Arsenic (as As)	7440-38-2	50 T	1450 T	50 T	50 T	2000 T	200 T
Asbestos	1332-21-4	a	NNS	NNS	NNS	NNS	NNS
Atrazine	1912-24-9	3	NNS	4900	4900	NNS	NNS
Barium (as Ba)	7440-39-3	2000 T	NNS	9800 D	9800 D	NNS	NNS
Benzene	71-43-2	5	120	48	NNS	NNS	NNS
Benzidine	92-87-5	0.0002	0.002	0.006	420	0.01	0.01
Benz (a) anthracene	56-55-3	0.003	0.00008	0.12	NNS	NNS	NNS
Benzo (a) pyrene	50-32-8	0.2	0.002	0.2	NNS	NNS	NNS
Benzo (ghi) perylene	191-24-2	NNS	NNS	NNS	NNS	NNS	NNS
Benzo (k) fluoranthene	207-08-9	0.003	0.00001	0.12	NNS	NNS	NNS
3,4-Benzofluoranthene	205-99-2	0.003	0.00004	0.12	NNS	NNS	NNS
Beryllium (as Be)	7440-41-7	4 T	0.21 T	4 T	700 T	NNS	NNS
Bis (2-chloroethoxy) methane	111-91-1	NNS	NNS	NNS	NNS	NNS	NNS

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria							
PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
Bis (2-chloroethyl) ether	111-44-4	0.03	1.4	1.3	NNS	NNS	NNS
Bis (2-chloroisopropyl) ether	108-60-1	280	15000	5600	5600	NNS	NNS
Boron (as B)	7440-42-8	630	NNS	12600	12600	1000 T	NNS
Bromodichlorom ethane	75-27-4	TTHM	22	100	2800	NNS	NNS
p-Bromodiphenyl ether	101-55-3	NNS	NNS	NNS	NNS	NNS	NNS
Bromoform	75-25-2	TTHM	80	180	2800	NNS	NNS
Bromomethane	74-83-9	9.8	7500	200	200	NNS	NNS
Butyl benzyl phthalate	85-68-7	1400	5000	28000	28000	NNS	NNS
Cadmium (as Cd)	7440-43-9	5 T	41 T	70 T	70 T	50 T	50 T
Carbofuran	1563-66-2	40	NNS	700	700	NNS	NNS
Carbon tetrachloride	56-23-5	5	5.5	11	98	NNS	NNS
Chlordane	57-74-9	2	0.001	2	8.4	NNS	NNS
Chlorine (total residual)	7782-50-5	NNS	NNS	14000	14000	NNS	NNS
Chlorobenzene	108-90-7	100	500	2800	2800	NNS	NNS
p-Chloro-m-cresol	59-50-7	NNS	NNS	NNS	NNS	NNS	NNS
2-Chloroethyl vinyl ether	110-75-8	NNS	NNS	NNS	NNS	NNS	NNS
Chloroform	67-66-3	TTHM	590	230	1400	NNS	NNS
Chloromethane	74-87-3	NNS	NNS	NNS	NNS	NNS	NNS
Chloronapthalene beta	91-58-7	560	13000	11000	11000	NNS	NNS
2-Chlorophenol	95-57-8	35	2100	700	700	NNS	NNS

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria							
PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
4-Chlorophenyl phenyl ether	7005-72-3	NNS	NNS	NNS	NNS	NNS	NNS
Chromium (as Cr III)	16065-83-1	NNS	67000 T	140000 T	140000 T	NNS	NNS
Chromium (as Cr VI)	18540-29-9	NNS	3400 T	700 T	700 T	NNS	NNS
Chromium (Total as Cr)	7440-47-3	100 T	NNS	NNS	NNS	1000 T	1000 T
Chrysene	218-01-9	0.003	.0001	0.12	NNS	NNS	NNS
Copper (as Cu)	7440-50-8	1000 D	NNS	5200 D	5200 D	5000 T	500 T
Cyanide	57-12-5	200 T	210000 T	2800 T	2800 T	NNS	200 T
Dibenz (ah) anthracene	53-70-3	0.003	0.00003	0.12	NNS	NNS	NNS
Dibromochloromethane	124-48-1	TTHM	12	17	2800	NNS	NNS
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	0.2	NNS	NNS	NNS	NNS	NNS
1,2-Dibromoethane (EDB)	106-93-4	0.05	NNS	1.6	NNS	NNS	NNS
Dibutyl phthalate	84-74-2	700	2300	14000	14000	NNS	NNS
1,2-Dichlorobenzene	95-50-1	600	2800	13000	13000	NNS	NNS
1,3-Dichlorobenzene	541-73-1	94	2000	1880	1880	NNS	NNS
1,4-Dichloroenzene	106-46-7	75	1200	1880	1880	NNS	NNS
3,3'-Dichlorobenzidine	91-94-1	0.08	0.09	3.1	NNS	NNS	NNS

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria

PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
p,p'-Dichlorodiphenyl dichloroethane (DDD)	72-54-8	0.15	0.0009	5.8	NNS	0.001	0.001
p,p'-Dichlorodiphenyl dichloroethylene (DDE)	72-55-9	0.1	0.0006	4.1	NNS	0.001	0.001
p,p'-Dichlorodiphenyl trichloroethane (DDT)	50-29-3	0.1	0.0005	4.1	70	0.001	0.001
1,1-Dichloroethane	75-34-3	NNS	NNS	NNS	NNS	NNS	NNS
1,2-Dichloroethane	107-06-2	5	120	15	NNS	NNS	NNS
1,1-Dichloroethylene	75-35-4	7	4.5	7	1300	NNS	NNS
1,2-cis-Dichloroethylene	156-59-2	70	NNS	NNS	NNS	NNS	NNS
1,2-trans-Dichloroethylene	156-60-5	100	13000	2800	2800	NNS	NNS
Dichloromethane	75-09-2	5	480	190	8400	NNS	NNS
2,4-Dichlorophenol	120-83-2	21	810	420	420	NNS	NNS
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	70	NNS	1400	1400	NNS	NNS
1,2-Dichloropropane	78-87-5	5	NNS	NNS	NNS	NNS	NNS
1,3-Dichloropropene	542-75-6	0.2	6.6	7.8	42	NNS	NNS
Dieldrin	60-57-1	0.002	0.0002	0.09	7	k	k

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria							
PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
Diethyl phthalate	84-66-2	5600	110000	110000	110000	NNS	NNS
Di(2-ethylhexyl) phthalate	117-81-7	6	7.4	100	2800	NNS	NNS
2,4-Dimethylphenol	105-67-9	140	2200	2800	2800	NNS	NNS
Dimethyl phthalate	131-11-3	70000	2800000	1400000	1400000	NNS	NNS
4,6-Dinitro-o-cresol	534-52-1	2.7	120	55	55	NNS	NNS
2,4-Dinitrophenol	51-28-5	14	5400	280	280	NNS	NNS
2,4-Dinitrotoluene	121-14-2	14	163	280	280	NNS	NNS
2,6-Dinitrotoluene	606-20-2	NNS	NNS	NNS	NNS	NNS	NNS
Di-n-octyl phthalate	117-84-0	NNS	NNS	NNS	NNS	NNS	NNS
1,2-Diphenylhydrazine	122-66-7	0.04	0.25	1.8	NNS	NNS	NNS
Endosulfan sulfate	1031-07-8	0.35	0.78	7	7	NNS	NNS
Endosulfan (Total)	115-29-7	42	110	840	840	NNS	NNS
Endrin	72-20-8	0.2	1.1	40	40	0.004	0.004
Endrin aldehyde	7421-93-3	2.1	0.81	420	420	NNS	NNS
Ethylbenzene	100-41-4	700	110000	14000	14000	NNS	NNS
Ethyl chloride	75-00-3	NNS	NNS	NNS	NNS	NNS	NNS
Fluoranthene	206-44-0	280	130	5600	5600	NNS	NNS
Fluorene	86-73-7	280	580	5600	5600	NNS	NNS
Fluorine	7782-41-4	4000	NNS	8400	8400	NNS	NNS
Heptachlor	76-44-8	0.4	0.0002	0.4	70	NNS	NNS

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria							
PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
Heptachlor epoxide	1024-57-3	0.2	0.0001	0.2	2	NNS	NNS
Hexachlorobenzene	118-74-1	1	0.002	1	280	NNS	NNS
Hexachlorobutadiene	87-68-3	0.45	0.52	18	NNS	NNS	NNS
Hexachlorocyclohexane alpha	319-84-6	0.006	0.03	0.22	NNS	NNS	NNS
Hexachlorocyclohexane beta	319-85-7	0.02	0.02	0.78	NNS	NNS	NNS
Hexachlorocyclohexane delta	319-86-8	NNS	NNS	NNS	NNS	NNS	NNS
Hexachlorocyclohexane gamma (lindane)	58-89-9	0.2	0.02	1	42	NNS	NNS
Hexachlorocyclopentadiene	77-47-4	50	550	1000	1000	NNS	NNS
Hexachloroethane	67-72-1	2.5	4.8	100	140	NNS	NNS
Indeno (1,2,3-cd) pyrene	193-39-5	0.003	0.000003	0.12	NNS	NNS	NNS
Isophorone	78-59-1	36.8	2300	1500	28000	NNS	NNS
Lead (as Pb)	7439-97-1	50 T	NNS	NNS	NNS	10000 T	100 T
Manganese (as Mn)	7439-96-5	4900 T	NNS	19600 T	19600 T	10000	NNS
Mercury (as Hg)	7439-97-6	2 T	0.6 T	42 T	42 T	NNS	10 T
Methoxychlor	72-43-5	40	NNS	700	700	NNS	NNS
Naphthalene	91-20-3	NNS	NNS	NNS	NNS	NNS	NNS
Nickel (as Ni)	7440-02-0	100 T	730 T	2800 T	2800 T	NNS	NNS
Nitrate (as N)	14797-55-8	10000	NNS	224000	224000	NNS	NNS
Nitrite (as N)	14797-65-0	1000	NNS	14000	14000	NNS	NNS

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria							
PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
Nitrate/Nitrite (as Total N)		10000	NNS	NNS	NNS	NNS	NNS
Nitrobenzene	98-95-3	3.5	600	70	70	NNS	NNS
o-Nitrophenol	88-75-5	NNS	NNS	NNS	NNS	NNS	NNS
p-Nitrophenol	100-02-7	NNS	NNS	NNS	NNS	NNS	NNS
N-nitrosodimethylamine	62-75-9	0.0007	2.1	0.03	NNS	NNS	NNS
N-nitrosodiphenylamine	86-30-6	7.1	14	290	NNS	NNS	NNS
N-nitrosodi-n-propylamine	621-64-7	0.005	0.51	0.2	NNS	NNS	NNS
Pentachlorophenol	87-86-5	1	8.2	11.7	2000	NNS	NNS
Phenanthrene	85-01-8	NNS	NNS	NNS	NNS	NNS	NNS
Phenol	108-95-2	4200	6500000	84000	84000	NNS	NNS
Polychlorinatedbiphenyls (PCBs)	1336-36-3	0.5	0.00009	0.5	NNS	0.001	0.001
Pyrene	129-00-0	210	1100	4200	4200	NNS	NNS
Selenium (as Se)	7782-49-2	50 T	9000 T	700 T	700 T	20 T	50 T
Silver (as Ag)	7440-22-4	NNS	NNS	NNS	NNS	NNS	NNS
Styrene	100-42-5	100	NNS	28000	28000	NNS	NNS
Sulfides		NNS	NNS	NNS	NNS	NNS	NNS
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	1746-01-6	0.0000003	0.000000004	0.00009	NNS	NNS	NNS
1,1,2,2-Tetrachloroethane	79-34-5	0.17	11	7	NNS	NNS	NNS

Appendix A: Table 1. Human Health and Agricultural Designated Use Numeric Water Quality Criteria							
PARAMETER	CAS[1] NUMBER	DWS[2] (µg/L)	FC[2] (µg/L)	FBC[2] (µg/L)	PBC[2] (µg/L)	AgI[2] (µg/L)	AgL[2] (µg/L)
Tetrachloroethylene	127-18-4	5	11	35	1400	NNS	NNS
Thallium (as Tl)	7440-28-0	2 T	41 T	12 T	12 T	NNS	NNS
Toluene	108-88-3	1000	90000	28000	28000	NNS	NNS
Toxaphene	8001-35-2	3	0.0008	3	NNS	0.005	0.005
1,2,4-Trichlorobenzene	120-82-1	70	155	1400	1400	NNS	NNS
1,1,1-Trichloroethane	71-55-6	200	NNS	NNS	NNS	NNS	NNS
1,1,2-Trichloroethane	79-00-5	5	31	25	560	NNS	NNS
Trichloroethylene	79-01-6	5	NNS	NNS	NNS	NNS	NNS
2,4,6-Trichlorophenol	88-06-2	3.2	4.9	130	NNS	NNS	NNS
2-(2,4,5-Trichlorophenoxy) proprionic acid (2,4,5-TP)	93-72-1	50	NNS	1120	1120	NNS	NNS
Trihalomethanes, Total		100	NNS	NNS	NNS	NNS	NNS
Uranium (as Ur)	7440-61-1	35 D	NNS	NNS	NNS	NNS	NNS
Vinyl chloride	75-01-4	2	620	80	NNS	NNS	NNS
Xylenes (Total)	1330-20-7	10000	NNS	280000	280000	NNS	NNS
Zinc (as Zn)	7440-66-6	2100 T	22000 T	42000 T	42000 T	10000 T	25000 T

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria									
PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wedw Acute[3] (µg/L)	A&Wedw Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
Acenaphthene	83-32-9	850	550	850	550	850	550	NNS	NNS
Acenaphthylene	208-96-8	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Acrolein	107-02-8	34	30	34	30	34	30	NNS	NNS
Acrylonitrile	107-13-1	3800	250	3800	250	3800	250	NNS	NNS
Alachlor	15972-60-8	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Aldrin	309-00-2	2.0	NNS	2.0	NNS	2.0	NNS	4.5	NNS
Ammonia	7664-41-7	b	b	b	b	NNS	NNS	NNS	NNS
Anthracene	120-12-7	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Antimony (as Sb)	7440-36-0	88 D	30 D	88 D	30 D	1000 D	600 D	NNS	NNS
Arsenic (as As)	7440-38-2	360 D	190 D	360 D	190 D	360 D	190 D	440 D	230 D
Asbestos	1332-21-4	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Atrazine	1912-24-9	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Barium (as Ba)	7440-39-3	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzene	71-43-2	2700	180	2700	180	11000	700	NNS	NNS
Benzidine	92-87-5	1300	89	1300	89	1300	89	10000	640
Benz (a) anthracene	56-55-3	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzo (a) pyrene	50-32-8	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzo (ghi) perylene	191-24-2	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Benzo (k) fluoranthene	207-08-9	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
3,4-Benzofluoranthene	205-99-2	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Beryllium (as Be)	7440-41-7	65 D	5.3 D	65 D	5.3 D	65 D	5.3 D	NNS	NNS
Bis (2-chloroethoxy) methane	111-91-1	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Bis (2-chlorethyl) ether	111-44-4	120000	6700	120000	6700	120000	6700	NNS	NNS

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria									
PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wedw Acute[3] (µg/L)	A&Wedw Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
Bis (2-chloroisopropyl) ether	108-60-1	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Boron (as B)	7440-42-8	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Bromodichloromethane	75-27-4	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
p-Bromodiphenyl ether	101-55-3	180	14	180	14	180	14	NNS	NNS
Bromoform	75-25-2	15000	10000	15000	10000	15000	10000	NNS	NNS
Bromomethane	74-83-9	5500	360	5500	360	5500	360	NNS	NNS
Butyl benzyl phthalate	85-68-7	1700	130	1700	130	1700	130	NNS	NNS
Cadmium (as Cd)	7440-43-9	c D	c D	c D	c D	c D	c D	c D	c D
Carbofuran	1563-66-2	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Carbon tetrachloride	56-23-5	18000	1100	18000	1100	18000	1100	NNS	NNS
Chlordane	57-74-9	2.4	0.004	2.4	0.21	2.4	0.21	3.2	0.45
Chlorine (total residual)	7782-50-5	11	5.0	11	5.0	11	5.0	NNS	NNS
Chlorobenzene	108-90-7	9800	620	9800	620	NNS	NNS	NNS	NNS
p-Chloro-m-cresol	59-50-7	15	4.7	15	4.7	15	4.7	48000	15000
2-Chloroethyl vinyl ether	110-75-8	180000	9800	180000	9800	180000	9800	NNS	NNS
Chloroform	67-66-3	14000	900	14000	900	14000	900	NNS	NNS
Chloromethane	74-87-3	270000	15000	270000	15000	270000	15000	NNS	NNS
Chloronapthalene beta	91-58-7	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
2-Chlorophenol	95-57-8	2200	150	2200	150	2200	150	NNS	NNS

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria									
PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wedw Acute[3] (µg/L)	A&Wedw Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
4-Chlorophenyl phenyl ether	7005-72-3	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Chromium (as Cr III)	16065-83-1	d D	d D	d D	d D	d D	d D	d D	d D
Chromium (as Cr VI)	18540-29-9	16 D	11 D	16 D	11 D	16 D	11 D	34 D	23 D
Chromium (Total as Cr)	7440-47-3	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Chrysene	218-01-9	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Copper (as Cu)	7440-50-8	e D	e D	e D	e D	e D	e D	e D	e D
Cyanide	57-12-5	22 T	5.2 T	41 T	9.7 T	41 T	9.7 T	84 T	19 T
Dibenz (ah) anthracene	53-70-3	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Dibromochloromethane	124-48-1	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
1,2-Dibromoethane (EDB)	106-93-4	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Dibutyl phthalate	84-74-2	470	35	470	35	470	35	1100	84
1,2-Dichlorobenzene	95-50-1	790	300	1200	470	1200	470	5900	2300
1,3-Dichlorobenzene	541-73-1	2500	970	2500	970	2500	970	NNS	NNS
1,4-Dichlorobenzene	106-46-7	560	210	2000	780	2000	780	6500	2500
3,3'-Dichlorobenzidine	91-94-1	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria									
PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wedw Acute[3] (µg/L)	A&Wedw Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	1.1	0.001	1.1	0.02	1.1	0.02	1.1	0.02
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	1.1	0.001	1.1	0.02	1.1	0.02	1.1	0.03
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	1.1	0.001	1.1	0.001	1.1	0.001	1.1	0.006
1,1-Dichloroethane	75-34-3	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
1,2-Dichloroethane	107-06-2	59000	41000	59000	41000	59000	41000	NNS	NNS
1,1-Dichloroethylene	75-35-4	15000	950	15000	950	15000	950	NNS	NNS
1,2-cis-Dichloroethylene	156-59-2	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
1,2-trans-Dichloroethylene	156-60-5	68000	3900	68000	3900	68000	3900	NNS	NNS
Dichloromethane	75-09-2	97000	5500	97000	5500	97000	5500	NNS	NNS
2,4-Dichlorophenol	120-83-2	1000	88	1000	88	1000	88	NNS	NNS
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
1,2-Dichloropropane	78-87-5	26000	9200	26000	9200	26000	9200	NNS	NNS
1,3-Dichloropropene	542-75-6	3000	1100	3000	1100	3000	1100	NNS	NNS
Dieldrin	60-57-1	2.5	0.002	2.5	0.002	2.5	0.005	4	0.9
Diethyl phthalate	84-66-2	26000	1600	26000	1600	26000	1600	NNS	NNS

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria									
PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wed w Acute[3] (µg/L)	A&Wed w Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
Di(2-ethylhexyl) phthalate	117-81-7	400	360	400	360	400	360	3100	360
2,4-Dimethylphenol	105-67-9	1000	310	1000	310	1100	310	150000	43000
Dimethyl phthalate	131-11-3	17000	1000	17000	1000	17000	1000	NNS	NNS
4,6-Dinitro-o-cresol	534-52-1	310	24	310	24	310	24	NNS	NNS
2,4-Dinitrophenol	51-28-5	110	9.2	110	9.2	110	9.2	NNS	NNS
2,4-Dinitrotoluene	121-14-2	15000	970	15000	970	15000	970	NNS	NNS
2,6-Dinitrotoluene	606-20-2	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Di-n-octyl phthalate	117-84-0	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
1,2-Diphenylhydrazine	122-66-7	130	11	130	11	130	11	NNS	NNS
Endosulfan sulfate	1031-07-8	0.22	0.06	0.22	0.06	0.22	0.06	3.0	1.5
Endosulfan (Total)	115-29-7	0.22	0.06	0.22	0.06	0.22	0.06	3.0	1.5
Endrin	72-20-8	0.18	0.002	0.2	0.08	0.2	0.08	0.7	0.3
Endrin aldehyde	7421-93-3	0.18	0.002	0.2	0.08	0.2	0.08	0.7	0.3
Ethylbenzene	100-41-4	23000	1400	23000	1400	23000	1400	NNS	NNS
Ethyl chloride	75-00-3	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Fluoranthene	206-44-0	2000	1600	2000	1600	2000	1600	NNS	NNS
Fluorene	86-73-7	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Fluorine	7782-41-4	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Heptachlor	76-44-8	0.52	0.004	0.52	0.004	0.58	0.013	0.9	0.1
Heptachlor epoxide	1024-57-3	0.52	0.004	0.52	0.004	0.58	0.013	0.9	0.1
Hexachlorobenzene	118-74-1	6.0	3.7	NNS	NNS	NNS	NNS	NNS	NNS
Hexachlorobutadiene	87-68-3	45	8.2	45	8.2	45	8.2	NNS	NNS
Hexachlorocyclohexane alpha	319-84-6	1600	130	1600	130	1600	130	1600	130

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria									
PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wedw Acute[3] (µg/L)	A&Wedw Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
Hexachlorocyclohexane beta	319-85-7	1600	130	1600	130	1600	130	1600	130
Hexachlorocyclohexane delta	319-86-8	1600	130	1600	130	1600	130	1600	130
Hexachlorocyclohexane gamma (lindane)	58-89-9	2.0	0.08	3.4	0.28	7.6	0.61	11	0.9
Hexachlorocyclopentadiene	77-47-4	3.5	0.3	3.5	0.3	3.5	0.3	NNS	NNS
Hexachloroethane	67-72-1	490	350	490	350	490	350	850	610
Indeno (1,2,3-cd) pyrene	193-39-5	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Isophorone	78-59-1	59000	43000	59000	43000	59000	43000	NNS	NNS
Lead (as Pb)	7439-97-1	f D	f D	f D	f D	f D	f D	f D	f D
Manganese (as Mn)	7439-96-5	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Mercury (as Hg)	7439-97-6	2.4 D	0.01 D	2.4 D	0.01 D	2.6 D	0.2 D	5.0 D	2.7 D
Methoxychlor	72-43-5	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Naphthalene	91-20-3	1100	210	3300	600	3300	600	NNS	NNS
Nickel (as Ni)	7440-02-0	g D	g D	g D	g D	g D	g D	g D	g D
Nitrate (as N)	14797-55-8	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Nitrite (as N)	14797-65-0	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Nitrate/Nitrite (as Total N)		NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Nitrobenzene	98-95-3	1300	850	1300	850	1300	850	NNS	NNS
o-Nitrophenol	88-75-5	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
p-Nitrophenol	100-02-7	4100	3000	4100	3000	4100	3000	NNS	NNS
N-nitrosodimethylamine	62-75-9	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria									
PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wedw Acute[3] (µg/L)	A&Wedw Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
N-nitrosodiphenylamine	86-30-6	2900	200	2900	200	2900	200	NNS	NNS
N-nitrosodi-n-propylamine	621-64-7	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Pentachlorophenol	87-86-5	h	h	h	h	h	h	h	h
Phenanthrene	85-01-8	30	6.3	30	6.3	54	6.3	NNS	NNS
Phenol	108-95-2	5100	730	7000	1000	7000	1000	180000	26000
Polychlorinatedbiphenyls (PCBs)	1336-36-3	2.0	0.01	2.0	0.02	2.0	0.02	11	2.5
Pyrene	129-00-0	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Selenium (as Se)	7782-49-2	20 T	2.0 T	20 T	2.0 T	50 T	2.0 T	33 T	2.0 T
Silver (as Ag)	7440-22-4	i D	NNS	i D	NNS	i D	NNS	i D	NNS
Styrene	100-42-5	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Sulfides		100	NNS	100	NNS	100	NNS	100	NNS
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	1746-01-6	0.01	0.005	0.01	0.005	0.12	0.01	0.1	0.01
1,1,2,2-Tetrachloroethane	79-34-5	4700	3200	4700	3200	4700	3200	NNS	NNS
Tetrachloroethylene	127-18-4	2600	280	6500	680	6500	680	15000	1600
Thallium (as Tl)	7440-28-0	700 D	150 D	700 D	150 D	700 D	150 D	NNS	NNS
Toluene	108-88-3	8700	180	8700	180	8700	180	NNS	NNS
Toxaphene	8001-35-2	0.73	0.0002	0.73	0.02	0.73	0.02	11	1.5
1,2,4-Trichlorobenzene	120-82-1	750	130	1700	300	NNS	NNS	NNS	NNS
1,1,1-Trichloroethane	71-55-6	2600	1600	2600	1600	2600	1600	NNS	NNS

Appendix A: Table 2. Aquatic & Wildlife Designated Use Numeric Water Quality Criteria

PARAMETER	CAS[1] NUMBER	A&Wc Acute[3] (µg/L)	A&Wc Chronic[4] (µg/L)	A&Ww Acute[3] (µg/L)	A&Ww Chronic[4] (µg/L)	A&Wedw Acute[3] (µg/L)	A&Wedw Chronic[4] (µg/L)	A&We Acute[3] (µg/L)	A&We Chronic[4] (µg/L)
1,1,2-Trichloroethane	79-00-5	18000	12000	18000	12000	18000	12000	NNS	NNS
Trichloroethylene	79-01-6	20000	1300	20000	1300	20000	1300	NNS	NNS
2,4,6-Trichlorophenol	88-06-2	160	25	160	25	160	25	3000	460
2-(2,4,5-Trichlorophenoxy) proprionic acid (2,4,5-TP)	93-72-1	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Trihalomethanes, Total		NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Uranium (as Ur)	7440-61-1	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Vinyl chloride	75-01-4	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Xylenes (Total)	1330-20-7	NNS	NNS	NNS	NNS	NNS	NNS	NNS	NNS
Zinc (as Zn)	7440-66-6	j D	j D	j D	j D	j D	j D	j D	j D

Footnotes

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

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

c - Cadmium A&Wc acute standard: $e^{(1.128\ [\ln(\text{Hardness})]\ -\ 3.828)}$

A&Wc chronic standard: $e^{(0.7852\ [\ln(\text{Hardness})]\ -\ 3.490)}$

A&Ww acute standard: $e^{(1.128\ [\ln(\text{Hardness})]\ -\ 2.0149)}$

A&Ww chronic standard: e(0.7852 [ln(Hardness)] - 3.490)

A&Wedw acute standard: $e^{(1.128\ [\ln(\text{Hardness})]\ -\ 2.0149)}$

A&Wedw chronic standard: $e^{(0.7852\ [\ln(\text{Hardness})]\ -\ 3.490)}$

A&We acute standard: $e^{(1.128\ [\ln(\text{Hardness})]\ -\ 0.9691)}$

A&We chronic standard: $e^{(0.7852\ [\ln(\text{Hardness})]\ -\ 3.490)}$

(See Footnote 5)

d - Chromium III A&Wc acute standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 3.688)}$

A&Wc chronic standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 1.561)}$

A&Ww acute standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 3.688)}$

A&Ww chronic standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 1.561)}$

A&Wedw acute standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 4.9361)}$

A&Wedw chronic standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 1.561)}$

A&We acute standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 3.688)}$

A&We chronic standard: $e^{(0.8190\ [\ln(\text{Hardness})]\ +\ 1.561)}$

(See Footnote 5)

e - Copper A&Wc acute standard: $e^{(0.9422\ [\ln(\text{Hardness})]\ -\ 1.464)}$

A&Wc chronic standard: $e^{(0.8545\ [\ln(\text{Hardness})]\ -\ 1.465)}$

A&Ww acute standard: $e^{(0.9422\ [\ln(\text{Hardness})]\ -\ 1.464)}$

A&Ww chronic standard: $e^{(0.8545\ [\ln(\text{Hardness})]\ -\ 1.465)}$

A&Wedw acute standard: $e^{(0.9422\ [\ln(\text{Hardness})]\ -\ 1.464)}$

A&Wedw chronic standard: $e^{(0.8545\ [\ln(\text{Hardness})]\ -\ 1.465)}$

A&We acute standard: $e^{(0.9422\ [\ln(\text{Hardness})]\ -\ 1.1514)}$

A&We chronic standard: $e^{(0.8545\ [\ln(\text{Hardness})]\ -\ 1.1448)}$

(See Footnote 5)

f - LeadA&Wc acute standard: $e^{(1.2730\ [\ln(\text{Hardness})]\ -\ 1.460)}$

A&Wc chronic standard: $e^{(1.2730\ [\ln(\text{Hardness})]\ -\ 4.705)}$

A&Ww acute standard: $e^{(1.2730\ [\ln(Hardness)]\ -\ 1.460)}$

A&Ww chronic standard: $e^{(1.2730\ [\ln(Hardness)]\ -\ 4.705)}$

A&Wedw acute standard: $e^{(1.2730\ [\ln(Hardness)]\ -\ 1.460)}$

A&Wedw chronic standard: $e^{(1.2730\ [\ln(Hardness)]\ -\ 4.705)}$

A&We acute standard: $e^{(1.2730\ [\ln(Hardness)]\ -\ 0.7131)}$

A&We chronic standard: $e^{(1.2730\ [\ln(Hardness)]\ -\ 3.9518)}$

(See Footnote 5)

g - Nickel A&Wc acute standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 3.3611)}$

A&Wc chronic standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 1.1644)}$

A&Ww acute standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 3.3611)}$

A&Ww chronic standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 1.1644)}$

A&Wedw acute standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 3.3611)}$

A&Wedw chronic standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 1.1644)}$

A&We acute standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 4.4389)}$

A&We chronic standard: $e^{(0.8460\ [\ln(Hardness)]\ +\ 2.2417)}$

(See Footnote 5)

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

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

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

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

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

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

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

A&We chronic standard: $e^{(1.005\ (pH)\ -\ 3.9006)}$

(See Footnote 6)

i - Silver A&Wc acute standard: $e^{(1.72\ [\ln(Hardness)]\ -\ 6.52)}$

A&Ww acute standard: $e^{(1.72\ [\ln(Hardness)]\ -\ 6.52)}$

A&Wedw acute standard: $e^{(1.72\ [\ln(Hardness)]\ -\ 6.52)}$

A&We acute standard: $e^{(1.72\ [\ln(Hardness)]\ -\ 6.52)}$

(See Footnote 5)

j - Zinc A&Wc acute standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 0.860)}$

A&Wc chronic standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 0.761)}$

A&Ww acute standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 0.860)}$

A&Ww chronic standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 0.761)}$

A&Wedw acute standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 0.860)}$

A&Wedw chronic standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 0.761)}$

A&We acute standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 3.1342)}$

A&We chronic standard: $e^{(0.8473\ [\ln(Hardness)]\ +\ 3.0484)}$

(See Footnote 5)

k - The standard to protect this use is 0.003 ug/l aldrin/dieldrin.

1 - Chemical Abstract System (CAS) number is a unique identification number given to each chemical.

2 - The numeric standards to protect this use shall not be exceeded.

3 - Determination of compliance with acute standards shall be as prescribed in R18-11-120.C.

4 - Determination of compliance with chronic standards shall be as prescribed in R18-11-120.C.

5 - Hardness, expressed as mg/L $CaCO_3$, is inserted into the equation where it says "Hardness". Hardness is determined according to the following criteria:

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

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

6 - The pH is inserted into the equation where it says "pH". pH is determined according to the following criteria:

a. If the receiving water body has an A&Wc or A&Ww designated use, then pH is based on the pH of the receiving water body from a sample taken at the same time that the sample for pentachlorophenol is taken.

b. If the receiving water body has an A&Wedw or A&We designated use, then the pH is based on the pH of the effluent from a sample taken at the same time that the sample for pentachlorophenol is taken.

µg/L -micrograms per liter

NNS -No numeric standard.

D - Dissolved

T - Total recoverable

TTHM -Indicates that the chemical is a trihalomethane. See Trihalomethanes, Total for DWS standard.

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
BW	Alamo Lake	34°14'45"/113°35'00"		A&Ww			FBC			FC		AgL
BW	Big Sandy River	Aquarius & Hualapai Mountains		A&Ww			FBC			FC		AgL
BW	Bill Williams River	Buckskin & Rawhide Mountains		A&Ww			FBC			FC		AgL
BW	Blue Tank	34°40'14"/112°58'16"		A&Ww			FBC			FC		AgL
BW	Boulder Creek	Tributary to Burro Creek		A&Ww			FBC			FC	AgI	AgL
BW	Burro Creek (U)	Above confluence with Boulder Creek		A&Ww			FBC			FC		AgL
BW	Burro Creek	Below confluence with Boulder Creek		A&Ww			FBC			FC		AgL
BW	Conger Creek	Tributary to Burro Creek		A&Ww			FBC			FC		AgL
BW	Coors Lake	34°36'20"/113°11'25"		A&Ww			FBC			FC		
BW	Copper Basin Wash	Headwaters to bottom of perennial reach		A&Ww			FBC			FC		AgL
BW	Copper Basin Wash	Bottom of perennial reach/Skull Valley Wash			A & W e			PBC				AgL
BW	Cottonwood Canyon	Tributary to the Santa Maria River		A&Ww			FBC			FC		AgL
BW	Date Creek	Tributary to the Santa Maria River		A&Ww			FBC			FC		AgL
BW	Francis Creek (U)	Tributary to Burro Creek		A&Ww			FBC		D W S	FC	AgI	AgL
BW	Kirkland Creek	Tributary to Santa Maria River		A&Ww			FBC			FC	AgI	AgL
BW	Knight Creek	East of Hualapai Mountains		A&Ww			FBC			FC		AgL
BW	Peeple's Canyon Creek (U)	Tributary to Santa Maria River		A&Ww			FBC			FC		AgL
BW	Santa Maria River	Tributary to Alamo Lake		A&Ww			FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
BW	Trout Creek	Tributary to Big Sandy River		A&Ww			FBC			FC		AgL
CM	A-10 Backwater	33°31'38"/114°33'19"		A&Ww			FBC			FC		
CM	A-7 Backwater	33°34'39"/114°39'42"		A&Ww			FBC			FC		
CM	Adobe Lake	33°02'39"/114°39'19"		A&Ww			FBC			FC		
CM	Agate Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Big Springs Tank	36°36'10"/112°20'58"	A&Wc				FBC			FC		AgL
CM	Boucher Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Bright Angel Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Bright Angel Wash (EDW)	South Rim WWTP outfall to Coconino Wash				A&Wedw		PBC				AgL
CM	Bull Rush Canyon Wash	Tributary to Kanab Creek			A&We			PBC				
CM	Cataract Creek	Headwaters to Santa Fe Reservoir	A&Wc				FBC		DWS	FC	AgI	AgL
CM	Cataract Creek	Santa Fe Reservoir to Williams WWTP outfall		A&Ww			FBC			FC	AgI	AgL
CM	Cataract Creek (EDW)	Williams WWTP outfall to 1 km downstream				A&Wedw		PBC				
CM	Cataract Creek	Below 1 km downstream of Williams WWTP outfall to confluence of Red Lake Wash		A&Ww			FBC			FC		AgL
CM	Cataract Creek	Red Lake Wash to Havasupai Reservation			A&We			PBC				AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
CM	Cataract Lake	35°15'05"/112°12'58"	A&Wc				FBC		DWS	FC		AgL
CM	Chuar Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Cibola Lake	33°14'20"/114°40'16"		A&Ww			FBC			FC		
CM	City Reservoir	35°13'57"/112°11'23"	A&Wc				FBC		DWS	FC		
CM	Clear Creek	North rim, Grand Canyon	A&Wc				FBC			FC		
CM	Clear Lake	33°01'57"/114°31'26"		A&Ww			FBC			FC		
CM	Colorado River	Lake Powell to Topock	A&Wc				FBC		DWS	FC	AgI	AgL
CM	Colorado River	Topock to Imperial Dam		A&Ww			FBC		DWS	FC	AgI	AgL
CM	Colorado River	Imperial Dam to Mexico		A&Ww			FBC			FC	AgI	AgL
CM	Cottonwood Creek	Tributary to Tuxton Wash		A&Ww			FBC			FC		AgL
CM	Crystal Creek	North rim, Grand Canyon	A&Wc				FBC			FC		
CM	Deer Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Detrital Wash	Tributary to Lake Mead			A&We			PBC				
CM	Dogtown Reservoir	35°12'40"/112°07'46"	A&Wc				FBC		DWS	FC	AgI	AgL
CM	Dragon Creek	North rim, Grand Canyon		A&Ww			FBC			FC		
CM	Garden Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Gonzalez Lake	35°15'26"/112°12'07"	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
CM	Grand Wash	Tributary to Lake Mead			A & W e			PBC				
CM	Grapevine Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Grapevine Wash	Tributary to Lake Mead			A & W e			PBC				
CM	Hakatai Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Hance Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Hermit Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Holy Moses Wash (EDW)	Kingman WWTP outfall to 3 km downstream				A& We dw		PBC				
CM	Horn Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Hualapai Wash	Tributary to the Colorado River			A & W e			PBC				
CM	Hunter's Hole Backwater	32°31'15"/114°48'03"		A&Ww			FBC			FC		AgL
CM	Imperial Reservoir	32°53'04"/114°27'40"		A&Ww			FBC		D W S	FC	AgI	AgL
CM	Island Lake	33°01'52"/114°35'07"		A&Ww			FBC			FC		
CM	Jacob Lake	36°42'26"/112°13'48"		A&Ww			FBC			FC		
CM	Kaibab Lake	35°17'04"/112°09'17"	A&Wc				FBC		D W S	FC	AgI	AgL
CM	Kanab Creek	Kanab Plateau; northwestern Arizona		A&Ww			FBC		D W S	FC		AgL
CM	Kwagunt Creek	Grand Canyon	A&Wc				FBC			FC		

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
CM	Laguna Reservoir	32°51'15"/114°28'38"		A&Ww			FBC		DWS	FC	AgI	AgL
CM	Lake Havasu	34°18'15"/114°08'15"		A&Ww			FBC		DWS	FC	AgI	AgL
CM	Lake Mead	36°01'00"/114°44'15"	A&Wc				FBC		DWS	FC	AgI	AgL
CM	Lake Mohave	35°11'45"/114°34'00"	A&Wc				FBC		DWS	FC	AgI	AgL
CM	Lake Powell	36°57'00"/111°29'15"	A&Wc				FBC		DWS	FC	AgI	AgL
CM	Lonetree Canyon Creek	Grand Canyon		A&Ww			FBC			FC		
CM	Martinez Lake	32°58'52"/114°28'23"		A&Ww			FBC			FC	AgI	AgL
CM	Matkatamiba Creek	Grand Canyon, South Rim	A&Wc				FBC			FC		
CM	Mittry Lake	32°49'11"/114°27'41"		A&Ww			FBC			FC		
CM	Mohave Wash	Tributary to Lake Havasu			A&We			PBC				
CM	Monument Creek	Grand Canyon		A&Ww			FBC			FC		
CM	Nankoweap Creek	Grand Canyon	A&Wc				FBC			FC		
CM	National Canyon Creek	South rim, Grand Canyon	A&Wc				FBC			FC		
CM	North Canyon Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Nortons Lake	33°02'35"/114°37'58"		A&Ww			FBC			FC		
CM	Olo Creek	South rim, Grand Canyon		A&Ww			FBC			FC		

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
CM	Paria River	Paria Plateau, Northern AZ Border	A&Wc				FBC			FC		
CM	Phantom Creek	North rim, Grand Canyon	A&Wc				FBC			FC		
CM	Pipe Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Pretty Water Lake	33°19'45"/114°42'15"		A&Ww			FBC			FC		
CM	Quigley Ponds	32°43'00"/113°58'00"		A&Ww			FBC			FC		
CM	Red Canyon Creek	Grand Canyon		A&Ww			FBC			FC		
CM	Red Lake	35°40'00"/114°03'45"		A&Ww			FBC			FC		AgL
CM	Redondo Lake	32°44'32"/114°29'02"		A&Ww			FBC			FC		
CM	Roaring Springs	Headwaters of Roaring Springs Creek	A&Wc				FBC		DWS	FC		
CM	Roaring Springs Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Rock Canyon	Tributary to Truxton Wash			A&We			PBC				
CM	Royal Arch Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Ruby Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Russell Tank	34°52'22"/111°52'44"	A&Wc				FBC			FC		AgL
CM	Sacramento Wash	Tributary to Topock Marsh			A&We			PBC				
CM	Saddle Canyon Creek	West rim, Marble Canyon	A&Wc				FBC			FC		
CM	Santa Fe Reservoir	35°14'26"/112°11'04"	A&Wc				FBC		DWS	FC		
CM	Sapphire Creek	Grand Canyon	A&Wc				FBC			FC		

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
CM	Sawmill Canyon	Headwaters to abandoned gaging station		A&Ww			FBC			FC		AgL
CM	Sawmill Wash	Below abandoned gaging station			A&We			PBC				AgL
CM	Serpentine Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Shinumo Creek	North rim, Grand Canyon	A&Wc				FBC			FC		
CM	Short Creek	Tributary to the Virgin River			A&We			PBC				
CM	Slate Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Spring Canyon Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Stone Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Tapeats Creek	North rim, Grand Canyon	A&Wc				FBC			FC		
CM	Thunder River	Tributary to Tapeats Creek	A&Wc				FBC			FC		
CM	Topock Marsh	34°47'30"/114°31'00"		A&Ww			FBC		DWS	FC	AgI	AgL
CM	Trail Canyon Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Transept Canyon (EDW)	North Rim WWTP outfall to 1 km downstream				A&Wedw		PBC				
CM	Travertine Falls Creek	Grand Canyon	A&Wc				FBC			FC		
CM	Truxton Wash	Tributary to Red Lake			A&We			PBC				
CM	Turquoise Crek	Grand Canyon	A&Wc				FBC			FC		

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
CM	Unkar Creek	North rim, Grand Canyon	A&Wc				FBC			FC		
CM	Vasey's Paradise	Grand Canyon	A&Wc				FBC			FC		
CM	Virgin River	NW of Virgin Mtns; NW Arizona Border		A&Ww			FBC			FC	AgI	AgL
CM	Vishnu Creek	North rim, Grand Canyon	A&Wc				FBC			FC		
CM	Warm Springs Creek	Grand Canyon		A&Ww			FBC			FC		
CM	Wellton Canal	Yuma Canal System							DWS		AgI	AgL
CM	Wellton Ponds			A&Ww			FBC			FC		
CM	West Cataract Creek	Tributary to Cataract Lake	A&Wc				FBC			FC		AgL
CM	White Creek	Grand Canyon		A&Ww			FBC			FC		
CM	Wia Manua Park Lake	In Kingman		A&Ww			FBC			FC		
CM	Wright Canyon Creek	Tributary to Truxton Wash		A&Ww			FBC			FC		AgL
CM	YPG Pond	32°50'22"/114°26'25"		A&Ww			FBC			FC		
CM	Yuma Area Canals	Above municipal water treatment plant intakes							DWS		AgI	AgL
CM	Yuma Area Canals	Below municipal water treatment plant intakes and all drains									AgI	AgL
LC	Als Lake	35°02'17"/111°25'13"		A&Ww			FBC			FC		AgL
LC	Ashurst Lake	35°01'10"/111°24'09"	A&Wc				FBC			FC	AgI	AgL
LC	Atcheson Reservoir	34°00'00"/109°20'41"		A&Ww			FBC			FC	AgI	AgL
LC	Auger Creek	Tributary to Nutrioso Creek	A&Wc				FBC			FC		AgL
LC	Barbershop Canyon Creek	Tributary to East Clear Creek	A&Wc				FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Bear Canyon Creek	Tributary to Blue Ridge Reservoir	A&Wc				FBC			FC		AgL
LC	Bear Canyon Creek	Tributary to Willow Creek	A&Wc				FBC			FC		AgL
LC	Bear Canyon Lake	34°24'10"/111°00'09"	A&Wc				FBC			FC	AgI	AgL
LC	Becker Lake	34°09'16"/109°18'18"	A&Wc				FBC			FC		AgL
LC	Billy Creek	Tributary to Show Low Creek	A&Wc				FBC			FC		AgL
LC	Black Canyon Creek	Tributary to Chevelon Creek	A&Wc				FBC			FC	AgI	AgL
LC	Black Canyon Lake	34°19'50"/110°41'59"	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Blue Ridge Reservoir	34°33'15"/111°11'01"	A&Wc				FBC			FC	AgI	AgL
LC	Boot Lake	34°58'53"/111°20'00"		A&Ww			FBC			FC		AgL
LC	Buck Springs Canyon Creek	Tributary to Leonard Canyon Creek	A&Wc				FBC			FC		AgL
LC	Bunch Reservoir	34°02'12"/109°26'45"	A&Wc				FBC			FC	AgI	AgL
LC	Camillo Tank	34°55'03"/111°22'41"		A&Ww			FBC			FC		AgL
LC	Carnero Lake	34°06'57"/109°31'39"	A&Wc				FBC			FC		AgL
LC	Chevelon Canyon Lake	34°30'39"/110°49'28"	A&Wc				FBC			FC	AgI	AgL
LC	Chevelon Creek	Mogollon Plateau	A&Wc				FBC			FC	AgI	AgL
LC	Chevelon Creek, West Fork	Tributary to Chevelon Creek	A&Wc				FBC			FC		AgL
LC	Chilson Tank	34°51'46"/111°22'52"		A&Ww			FBC			FC		AgL
LC	Cholla Lake	34°56'00"/110°17'12"		A&Ww			FBC			FC		AgL
LC	Clear Creek	Mogollon Plateau; east of Winslow	A&Wc				FBC		DWS	FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Clear Creek Reservoir	34°58'10"/110°38'33"	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Coconino Reservoir	35°00'16"/111°23'52"	A&Wc				FBC			FC	AgI	AgL
LC	Colter Creek	Tributary to Nutrioso Creek	A&Wc				FBC			FC		AgL
LC	Colter Reservoir	33°56'40"/109°28'50"	A&Wc				FBC			FC		AgL
LC	Concho Creek	Tributary to Carrizo Wash		A&Ww			FBC			FC		AgL
LC	Concho Lake	34°26'36"/109°37'40"	A&Wc				FBC			FC	AgI	AgL
LC	Cow Lake	34°53'19"/111°18'49"		A&Ww			FBC			FC		AgL
LC	Coyote Creek	Tributary to Upper Little Colorado	A&Wc				FBC			FC	AgI	AgL
LC	Crisis Lake (Snake Tank #2)	34°47'51"/111°17'01"		A&Ww			FBC			FC		AgL
LC	Dane Canyon Creek	Tributary to Barbershop Canyon Creek	A&Wc				FBC			FC		AgL
LC	Daves Tank	34°44'23"/111°17'08"		A&Ww			FBC			FC		AgL
LC	Deep Lake	35°03'30"/111°24'55"		A&Ww			FBC			FC		AgL
LC	Dry Lake (EDW)	34°37'52"/110°23'40"				A&Wedw						
LC	Ducksnest Lake	34°59'15"/111°23'53"		A&Ww			FBC			FC		AgL
LC	East Clear Creek	Tributary to Clear Creek Reservoir	A&Wc				FBC			FC	AgI	AgL
LC	Ellis Wiltbank Reservoir	34°05'25"/109°28'24"		A&Ww			FBC			FC	AgI	AgL
LC	Fish Creek	Tributary to Little Colorado	A&Wc				FBC			FC		
LC	Fool's Hollow Lake	34°16'14"/110°04'15"	A&Wc				FBC			FC		AgL
LC	General Springs Creek	Tributary to Blue Ridge Reservoir	A&Wc				FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Geneva Reservoir	34°01'44"/109°31'44"		A&Ww			FBC			FC		AgL
LC	Hall Creek	Tributary to White Mountain Reservoir	A&Wc				FBC			FC	AgI	AgL
LC	Hart Canyon Creek	Tributary to Willow Creek	A&Wc				FBC			FC		AgL
LC	Hay Lake	34°00'11"/109°25'55"		A&Ww			FBC			FC		AgL
LC	Hog Wallow Lake	33°58'57"/109°25'38"		A&Ww			FBC			FC	AgI	AgL
LC	Horse Lake	35°03'53"/111°27'51"		A&Ww			FBC			FC		AgL
LC	Huffer Tank	34°27'45"/111°23'09"		A&Ww			FBC			FC		AgL
LC	Hulsey Creek	Tributary to Nutrioso Creek	A&Wc				FBC			FC		
LC	Hulsey Lake	33°55'57"/109°09'33"	A&Wc				FBC			FC		
LC	Indian Lake	35°00'38"/111°22'37"		A&Ww			FBC			FC		AgL
LC	Jack's Canyon Creek	Tributary to the Little Colorado		A&Ww			FBC			FC	AgI	AgL
LC	Jarvis Lake	33°58'59"/109°12'33"		A&Ww			FBC			FC		AgL
LC	Kinnikinick Lake	34°53'52"/111°18'20"	A&Wc				FBC			FC		AgL
LC	Knoll Lake	34°25'38"/111°05'10"	A&Wc				FBC			FC		AgL
LC	Lake Humphreys (EDW)	35°11'51"/111°35'16"				A&Wedw		PBC				
LC	Lake Mary, Lower	35°06'22"/111°34'20"	A&Wc				FBC			FC		AgL
LC	Lake Mary, Upper	35°04'45"/111°31'56"	A&Wc				FBC		DWS	FC		AgL
LC	Lake of the Woods	34°09'39"/109°58'45"	A&Wc				FBC			FC	AgI	AgL
LC	Lee Valley Creek	Tributary to Colter Reservoir	A&Wc				FBC			FC		AgL
LC	Lee Valley Reservoir	33°56'30"/109°30'00"	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Leonard Canyon Creek	Tributary to East Clear Creek	A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, East Fork	Tributary to Leonard Canyon Creek	A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, Middle Fork	Tributary to Leonard Canyon, West Fork	A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, West Fork	Tributary to Leonard Canyon, East Fork	A&Wc				FBC			FC		AgL
LC	Lily Creek	Escudilla Mountain	A&Wc				FBC			FC		AgL
LC	Little Colorado River	Above Lyman Reservoir	A&Wc				FBC			FC	AgI	AgL
LC	Little Colorado River	Below Lyman Reservoir		A&Ww			FBC		DWS	FC	AgI	AgL
LC	Little Colorado River, East Fork	White Mountains	A&Wc				FBC			FC	AgI	AgL
LC	Little Colorado River, South Fork	White Mountains	A&Wc				FBC			FC	AgI	AgL
LC	Little Colorado River, West Fork	Below Government Springs; White Mountains	A&Wc				FBC			FC	AgI	AgL
LC	Little Colorado Rv, West Fork (U)	Above Government Springs; White Mountains	A&Wc				FBC			FC		
LC	Little George Reservoir	34°00'37"/109°19'15"		A&Ww			FBC			FC	AgI	
LC	Little Mormon Lake	34°17'00"/109°58'03"		A&Ww			FBC			FC	AgI	AgL
LC	Little Ortega Lake	34°22'45"/109°40'00"	A&Ww				FBC			FC		
LC	Long Lake, Lower	34°46'45"/111°12'00"	A&Wc				FBC			FC	AgI	AgL
LC	Long Lake, Upper	35°00'00"/111°21'00"		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Long Tom Tank	34°20'37"/110°49'20"	A&Wc				FBC			FC		AgL
LC	Lower Walnut Canyon Lake (EDW)	35°12'04"/111°34'07"				A&We dw		PBC				
LC	Lyman Reservoir	34°21'30"/109°21'30"	A&Wc				FBC			FC	AgI	AgL
LC	Mamie Creek	Escudilla Mountain	A&Wc				FBC			FC	AgI	AgL
LC	Marshall Lake	35°07'10"/111°32'01"	A&Wc				FBC			FC		AgL
LC	McKay Reservoir	Apache-Sitgreaves National Forest	A&Wc				FBC			FC	AgI	AgL
LC	Merritt Draw Creek	Tributary to Barbershop Canyon Creek	A&Wc				FBC			FC		AgL
LC	Mexican Hay Lake	34°01'57"/109°21'25"	A&Wc				FBC			FC	AgI	AgL
LC	Milk Creek	Tributary to Hulsey Creek	A&Wc				FBC			FC		
LC	Miller Canyon Creek	Tributary to East Clear Creek	A&Wc				FBC			FC		AgL
LC	Miller Canyon Creek, East Fork	Tributary to Miller Canyon Creek	A&Wc				FBC			FC		AgL
LC	Mineral Creek	Near Vernon, Sitgreaves National Forest	A&Wc				FBC			FC	AgI	AgL
LC	Mormon Lake	34°56'40"/111°27'10"	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Morton Lake	34°53'36"/111°17'39"	A&Wc				FBC			FC		AgL
LC	Mud Lake	34°55'24"/111°21'18"		A&Ww			FBC			FC		AgL
LC	Ned Lake (EDW)	32°17'18"/110°03'20"				A&We dw		PBC				
LC	Nelson Reservoir	34°03'12"/109°11'18"	A&Wc				FBC			FC	AgI	AgL
LC	Norton Reservoir	34°03'57"/109°31'21"		A&Ww			FBC			FC		AgL
LC	Nutrioso Creek	Tributary to the Little Colorado	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Paddy Creek	Tributary to Nutrioso Creek	A&Wc				FBC			FC		
LC	Phoenix Park Wash	Tributary to Dry Lake			A & W e			PBC				
LC	Pine Tank	34°46'49"/111°17'17"		A&Ww			FBC			FC		AgL
LC	Pintail Lake (EDW)	34°18'06"/110°01'17"				A& We dw		PBC				
LC	Pool Corral Lake	33°58'16"/109°24'53"		A&Ww			FBC			FC	AgI	AgL
LC	Porter Creek	Tributary to Show Low Creek	A&Wc				FBC			FC		
LC	Potato Lake	34°27'44"/111°20'42"	A&Wc				FBC			FC		AgL
LC	Pratt Lake	34°01'31"/109°04'16"	A&Wc				FBC			FC		
LC	Puerco River	Tributary to the Little Colorado		A&Ww			FBC		D W S	FC	AgI	AgL
LC	Rainbow Lake	34°09'03"/109°59'01"	A&Wc				FBC			FC	AgI	AgL
LC	Reagan Reservoir	Apache-Sitgreaves National Forest		A&Ww			FBC			FC		AgL
LC	Rio de Flag (EDW)	Flagstaff WWTP outfall to the confluence with San Francisco Wash				A& We dw		PBC				
LC	River Reservoir	34°02'01"/109°26'07"	A&Wc				FBC			FC	AgI	AgL
LC	Rogers Reservoir	33°58'30"/109°16'18"		A&Ww			FBC			FC		AgL
LC	Rudd Creek	Tributary to Nutrioso Creek	A&Wc				FBC			FC		AgL
LC	Russel Reservoir	33°59'29"/109°20'00"		A&Ww			FBC			FC	AgI	AgL
LC	San Salvador Reservoir	33°58'51"/109°19'51"		A&Ww			FBC			FC	AgI	AgL
LC	Salt House Lake	33°57'06"/109°20'12"		A&Ww			FBC			FC		AgL
LC	Scott Reservoir	34°10'27"/109°57'27"	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Show Low Creek	Tributary to Silver Creek	A&Wc				FBC			FC	AgI	AgL
LC	Show Low Lake	34°11'25"/109°59'55"	A&Wc				FBC			FC	AgI	AgL
LC	Silver Creek	Tributary to Little Colorado; near Holbrook	A&Wc				FBC			FC	AgI	AgL
LC	Slade Reservoir	33°59'50"/109°20'00"		A&Ww			FBC			FC	AgI	AgL
LC	Soldiers Annex Lake	34°47'13"/111°13'48"	A&Wc				FBC			FC	AgI	AgL
LC	Soldiers Lake	34°47'49"/110°13'59"	A&Wc				FBC			FC	AgI	AgL
LC	Spaulding Tank	34°30'17"/111°02'03"		A&Ww			FBC			FC		AgL
LC	Sponseller Lake	34°14'10"/109°50'42"	A&Wc				FBC			FC		AgL
LC	St Johns Reservoir (Little Reservoir)	34°29'14"/109°21'57"		A&Ww			FBC			FC	AgI	AgL
LC	Telephone Lake (EDW)	34°17'35"/110°02'39"				A&We dw		PBC				
LC	Tremaine Lake	34°46'00"/111°14'10"	A&Wc				FBC			FC		AgL
LC	Tunnel Reservoir	34°01'51"/109°26'32"	A&Wc				FBC			FC	AgI	AgL
LC	Vail Lake	35°05'24"/111°30'42"	A&Wc				FBC			FC		AgL
LC	Walnut Creek	Tributary to Billy Creek	A&Wc				FBC			FC		AgL
LC	Water Canyon Creek	Tributary to the Little Colorado	A&Wc				FBC			FC		AgL
LC	Water Canyon Reservoir	34°00'15"/109°20'05"		A&Ww			FBC			FC	AgI	AgL
LC	Whale Lake	35°12'32"/111°34'42"				A&We dw		PBC				
LC	Whipple Lake	34°16'47"/109°58'28"		A&Ww			FBC			FC		AgL
LC	White Mountain Lake	34°21'54"/109°59'38"	A&Wc				FBC			FC	AgI	AgL
LC	White Mountain Reservoir	34°00'15"/109°30'48"	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
LC	Willow Creek	Tributary to East Clear Creek	A&Wc				FBC			FC		AgL
LC	Willow Springs Canyon Creek	Tributary to Chevelon Creek	A&Wc				FBC			FC		AgL
LC	Willow Springs Lake	34°18'45"/110°52'34"	A&Wc				FBC			FC	AgI	AgL
LC	Woodland Reservoir	34°07'36"/109°57'06"	A&Wc				FBC			FC	AgI	AgL
LC	Woods Canyon Creek	Tributary to Chevelon Creek	A&Wc				FBC			FC		AgL
LC	Woods Canyon Lake-	34°20'05"/110°56'35"	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Zuni River	Tributary to the Little Colorado		A&Ww			FBC			FC	AgI	AgL
LG	Columbus Wash	Tributary to the Gila River			A&We			PBC				
LG	Gila River	Painted Rock Dam to the Colorado River		A&Ww			FBC			FC	AgI	AgL
LG	Painted Rock (Borrow Pit) Lake	33°05'00"/113°01'20"		A&Ww			FBC			FC	AgI	AgL
MG	Agua Fria River	Above confluence with unnamed EDW wash receiving treated wastewater from the Prescott Valley WWTP outfall			A&We			PBC				AgL
MG	Agua Fria River (EDW)	Below confluence with unnamed wash receiving treated wastewater from the Prescott Valley WWTP outfall to State Route 169				A&Wedw		PBC				AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
MG	Agua Fria River	State Route 169 to Lake Pleasant		A&Ww			FBC		DWS	FC	AgI	AgL
MG	Agua Fria River	Below Lake Pleasant to the El Mirage WWTP outfall			A&We			PBC				AgL
MG	Agua Fria River (EDW)	El Mirage WWTP outfall to 2 km downstream				A&Wedw		PBC				
MG	Agua Fria River	Below 2 km downstream of the El Mirage WWTP outfall to State Highway 85			A&We			PBC				
MG	Agua Fria River	Below State Highway 85		A&Ww			FBC			FC		
MG	Alvord Park Lake	Municipal Park Lake; 35th Avenue & Baseline Road; Phoenix		A&Ww				PBC		FC		
MG	Antelope Creek	Tributary to Martinez Creek		A&Ww			FBC			FC	AgI	AgL
MG	Arlington Canal	Above Wilson Avenue										AgL
MG	Ash Creek	Tributary to the Agua Fria River		A&Ww			FBC			FC	AgI	AgL
MG	Beehive Tank	32°52'36"/111°02'19"		A&Ww			FBC			FC		AgL
MG	Big Bug Creek	Tributary to the Agua Fria River		A&Ww			FBC			FC	AgI	AgL
MG	Black Canyon Creek	Tributary to the Agua Fria River		A&Ww			FBC			FC	AgI	AgL
MG	Blind Indian Creek	Tributary to the Hassayampa River		A&Ww			FBC			FC	AgI	AgL
MG	Bonsall Park Lake	Municipal Park Lake; 59th Avenue & Bethany Home Road; Phoenix		A&Ww				PBC		FC		
MG	Canal Park Lake	Municpal Park Lake; College Avenue & Curry Road; Tempe		A&Ww				PBC		FC		

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES								
MG	Cave Creek	Headwaters to the Cave Creek Dam		A&Ww			FBC			FC		AgL
MG	Cave Creek	Cave Creek Dam to the Arizona Canal			A & W e			PBC				
MG	Centennial Wash	Tributary to the Gila River; west of Hassayampa			A & W e			PBC				
MG	Centennial Wash Ponds	33°55'10"/113°23'05"		A&Ww			FBC			FC		AgL
MG	Chaparral Park Lake	Municipal Park Lake; Hayden Road & Chaparral Road, Scottsdale		A&Ww				PBC		FC	AgI	
MG	Cortez Park Lake	Municipal Park Lake; 35th Avenue & Dunlap, Glendale		A&Ww				PBC		FC	AgI	
MG	Desert Breeze Lake	Municipal Park Lake; Galaxy Drive, West Chandler		A&Ww				PBC		FC		
MG	Dobson Lake	Municipal Park Lake; Dobson Road & Los Lagos Vista Avenue, Mesa		A&Ww				PBC		FC		
MG	Eldorado Park Lake	Municipal Park Lake; Miller Road & Oak Street, Tempe		A&Ww				PBC		FC		
MG	Encanto Park Lake	Municipal Park Lake, 15th Avenue & Encanto Blvd., Phoenix		A&Ww				PBC		FC	AgI	
MG	Galena Gulch	Tributary to the Agua Fria River			A & W e			PBC				AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
MG	Gila River	San Carlos Indian Reservation to the Ashurst-Hayden Dam		A&Ww			FBC			FC	AgI	AgL
MG	Gila River	Ashurst-Hayden Dam to the Florence WWTP outfall			A&We			PBC				AgL
MG	Gila River (EDW)	Florence WWTP outfall to Felix Road				A&Wedw		PBC				
MG	Gila River	Felix Road to Gila River Indian Reservation			A&We			PBC				AgL
MG	Gila River (EDW)	Salt River to the Gillespie Dam				A&Wedw		PBC		FC	AgI	AgL
MG	Gila River	Gillespie Dam to Painted Rock Dam		A&Ww			FBC			FC	AgI	AgL
MG	Granada Park Lake	Municipal Park Lake; 6505 North 20th Street, Phoenix		A&Ww				PBC		FC		
MG	Groom Creek	Tributary to the Hassayampa River	A&Wc				FBC		DWS	FC		
MG	Hank Raymond Lake	33°50'18"/112°16'07"		A&Ww			FBC			FC	AgI	AgL
MG	Hassayampa Lake	34°25'45"/112°25'29"	A&Wc				FBC		DWS	FC		
MG	Hassayampa River	Headwaters to 8 miles south of Wickenburg		A&Ww			FBC			FC	AgI	AgL
MG	Hassayampa River	8 miles south of Wickenburg to the Buckeye Irrigation Company Canal			A&We			PBC				AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
MG	Hassayampa River	Buckeye Irrigation Company canal to the Gila River		A&Ww			FBC			FC		AgL
MG	Horsethief Lake	34°09'42"/112°17'56"	A&Wc				FBC		DWS	FC		AgL
MG	Indian Bend Wash	Scottsdale		A&Ww				PBC		FC		
MG	Indian Bend Wash Lakes	Municipal Park Lakes; Scottsdale		A&Ww				PBC		FC		
MG	Indian School Park Lake	Municipal Park Lake; Indian School Road & Hayden Road, Scottsdale		A&Ww				PBC		FC		
MG	Kiwanis Park Lake	Municipal Park Lake; 6000 South Mill Avenue, Tempe		A&Ww				PBC		FC	AgI	
MG	Lake Pleasant	33°51'15"/112°16'15"		A&Ww			FBC			FC	AgI	AgL
MG	Lion Canyon	Tributary to Weaver Creek		A&Ww			FBC			FC		
MG	Little Ash Creek	Tributary to Ash Creek; Prescott National Forest		A&Ww			FBC			FC		AgL
MG	Lynx Creek	Tributary to Lynx Lake		A&Ww			FBC			FC		AgL
MG	Lynx Lake	34°31'08"/112°23'05"	A&Wc				FBC		DWS	FC	AgI	AgL
MG	Martinez Creek	Tributary to the Hassayampa River		A&Ww			FBC			FC	AgI	AgL
MG	McKellips Park Lake	Municipal Park Lake; Miller Road & McKellips Road, Scottsdale		A&Ww				PBC		FC	AgI	
MG	Mineral Creek	Tributary to the Gila River		A&Ww			FBC			FC		AgL
MG	Minnehaha Creek	Tributary to the Hassayampa River		A&Ww			FBC			FC		AgL
MG	New River	Headwaters to I-17		A&Ww			FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
MG	New River	Below I-17			A & W e			PBC				AgL
MG	Painted Rock Reservoir	33°04'15"/113°00'30"		A&Ww			FBC			FC	AgI	AgL
MG	Papago Park Ponds	Municipal Park Lake; Galvin Parkway, Phoenix		A&Ww				PBC		FC		
MG	Perry Mesa Tank	34°11'03"/112°01'59"		A&Ww			FBC			FC		AgL
MG	Phoenix Area Canals	Granite Reef Dam to all municipal WTP intakes							D W S		AgI	AgL
MG	Phoenix Area Canals	Below municipal WTP intakes and all other locations									AgI	AgL
MG	Picacho Reservoir	32°51'17"/111°28'49"		A&Ww			FBC			FC	AgI	AgL
MG	Poland Creek	Tributary to the Agua Fria; Bradshaw Mtns		A&Ww			FBC			FC		AgL
MG	Queen Creek	Headwaters to the Superior Mining Division discharge outfall		A&Ww				PBC	D W S	FC		AgL
MG	Queen Creek (EDW)	Superior Mining Division discharge outfall to confluence with Potts Canyon				A& We dw		PBC				
MG	Queen Creek	Potts Canyon to El Camino Viejo Road		A&Ww			FBC			FC		AgL
MG	Queen Creek	Below El Camino Viejo Road			A & W e			PBC				AgL
MG	Riverview Park Lake	Municipal Park Lake; Dobson Road & 8th Street, Mesa		A&Ww				PBC		FC		

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
MG	Roadrunner Park Lake	Municipal Park Lake; 36th Street & Cactus, Phoenix		A&Ww				PBC		FC		
MG	Salt River	Granite Reef Dam to 2 km downstream		A&Ww			FBC		DWS	FC	AgI	AgL
MG	Sycamore Creek	Tributary to the Agua Fria River	A&Wc				FBC			FC		AgL
MG	Turkey Creek	Tributary to Black Canyon Creek		A&Ww			FBC			FC	AgI	AgL
MG	Unnamed Wash (EDW)	Gila Bend WWTP outfall to the Gila River				A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Luke Air Force Base WWTP outfall to the Agua Fria River				A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Prescott Valley WWTP outfall to the Agua Fria River				A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Queen Valley Sanitary District WWTP outfall to the confluence with Queen Creek				A&Wedw		PBC				
MG	Vista Del Camino Park North	Municipal Park Lake; 7700 East Roosevelt Street, Scottsdale		A&Ww				PBC		FC		
MG	Vista Del Camino Park South	Municipal Park Lake; 7700 East Roosevelt Street, Scottsdale		A&Ww				PBC		FC		
MG	Weaver Creek	Tributary to Martinez Creek		A&Ww			FBC			FC		
RM	Abbot Canyon	Mule Mountains		A&Ww			FBC		DWS	FC	AgI	AgL
RM	Ash Creek	Chiricahua Mountains	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
RM	Blackwater Draw	San Bernardino Valley		A&Ww			FBC		D W S	FC	AgI	AgL
RM	Buck Canyon	Chiricahua Mountains		A&Ww			FBC		D W S	FC	AgI	AgL
RM	California Gulch	South of Ruby		A&Ww			FBC			FC		AgL
RM	Dixie Canyon	Mule Mountains		A&Ww			FBC		D W S	FC	AgI	AgL
RM	Dry Canyon	Mule Mountains		A&Ww			FBC		D W S	FC	AgI	AgL
RM	Gadwell Canyon	Mule Mountains		A&Ww			FBC		D W S	FC	AgI	AgL
RM	Glance Creek	Mule Mountains		A&Ww			FBC			FC	AgI	AgL
RM	Gold Gulch	Mule Mountains		A&Ww			FBC			FC	AgI	AgL
RM	Holden Canyon Creek	Coronado National Forest		A&Ww			FBC			FC		
RM	Johnson Canyon	Chiricahua Mountains		A&Ww			FBC		D W S	FC	AgI	AgL
RM	Leslie Canyon Creek	Chiricahua Mountains		A&Ww			FBC		D W S	FC		AgL
RM	Mexican Canyon	Mule Mountains		A&Ww			FBC		D W S	FC	AgI	AgL
RM	Mule Gulch	Headwaters to the Bisbee WWTP outfall		A&Ww				PBC		FC	AgI	AgL
RM	Mule Gulch (EDW)	Below the Bisbee WWTP outfall				A& We dw		PBC				AgL
RM	Ruby Lakes	Near the town of Ruby		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
RM	Rucker Canyon Creek	Chiricahua Mountains	A&Wc				FBC		D W S	FC		AgL
RM	Rucker Canyon Lake	31°46'46"/109°18'30"	A&Wc				FBC			FC		AgL
RM	Soto Canyon	Mule Mountains		A&Ww			FBC		D W S	FC	AgI	AgL
RM	Sycamore Canyon Creek	Coronado National Forest		A&Ww			FBC			FC		AgL
RM	Unnamed Wash (EDW)	Bisbee-Douglas International Airport WWTP outfall to Whitewater Draw				A& We dw		PBC				
RM	Whitewater Draw	Sulpher Springs Valley		A&Ww			FBC			FC	AgI	AgL
SC	Municipal Park Lake; 12325 East Roger Road, Tucson	Urban Lake; Tucson		A&Ww				PBC		FC		
SC	Agua Caliente Wash	Headwaters to the Coronado National Forest boundary		A&Ww			FBC			FC		AgL
SC	Agua Caliente Wash	Below Coronado National Forest boundary			A & W e			PBC				AgL
SC	Aguirre Wash	Aguirre Valley			A & W e			PBC				
SC	Alambre Wash	Tributary to Brawley Wash			A & W. e			PBC				

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SC	Alamo Wash	Tributary to Rillito Creek			A & We			PBC				
SC	Altar Wash	Altar Valley			A & We			PBC				
SC	Alum Gulch	Headwaters to T22S R16E Sec 19 CBB SW1/4		A&Ww			FBC			FC		AgL
SC	Alum Gulch	Below T22S R16E Sec 19 CBA SW1/4			A & We			PBC				AgL
SC	Arivaca Creek	Tributary to Arivaca Lake		A&Ww			FBC			FC		AgL
SC	Arivaca Lake	31°31'50"/111°15'05"		A&Ww			FBC			FC	AgI	AgL
SC	Atterbury Wash	Tributary to Pantano Wash			A & We			PBC				
SC	Bear Grass Tank	31°33'01"/111°11'32"		A&Ww			FBC			FC		AgL
SC	Big Wash	Tributary to Cañada del Oro			A & We			PBC				
SC	Bog Hole Tank	31°28'34"/110°37'07"		A&Ww			FBC			FC		AgL
SC	Brawley Wash	Avra Valley			A & We			PBC				
SC	Cañada del Oro	Headwaters to Highway 89		A&Ww			FBC		DWS	FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SC	Cañada del Oro	Below Highway 89			A & W e			PBC				AgL
SC	Cienega Creek	Headwaters to Interstate 10		A&Ww			FBC			FC		AgL
SC	Cienega Creek (U)	Interstate 10 to Del Lago Dam		A&Ww			FBC			FC		AgL
SC	Cienega Creek	Below Del Lago Dam		A&Ww			FBC			FC		AgL
SC	Davidson Canyon	Tributary to Cienega Creek			A & W e			PBC				AgL
SC	Empire Gulch	Headwaters to Empire Ranch Spring			A & W e			PBC				
SC	Empire Gulch	Below Empire Ranch Spring		A&Ww			FBC			FC		AgL
SC	Flux Canyon	Tributary to Alum Canyon			A & W e			PBC				AgL
SC	Gardner Canyon Creek	Tributary to Cienega Creek		A&Ww			FBC			FC		
SC	Greene Wash	Tributary to the Santa Cruz River			A & W e			PBC				
SC	Harshaw Wash	Headwaters to T22S R16E Sec 15 DAC NW 1/4		A&Ww			FBC			FC		AgL
SC	Harshaw Wash	Below T22S R16E Sec 15 DAC NW 1/4			A & W e			PBC				AgL
SC	Hit Tank	32°43'57"/111°03'18"		A&Ww			FBC			FC		AgL
SC	Huachuca Tank	31°21'11"/110°30'12"		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SC	Julian Wash	Tributary to the Santa Cruz River			A & We			PBC				
SC	Kennedy Lake	Municipal Park Lake; Mission Road & Ajo Road, Tucson		A&Ww				PBC		FC		
SC	Lakeside Lake	Municipal Park Lake; 8300 East Stella Road, Tucson		A&Ww				PBC		FC		
SC	Lemmon Canyon Creek	Tributary to Sabino Canyon Creek	A&Wc				FBC			FC		
SC	Los Robles Wash	Tributary to the Santa Cruz River			A & We			PBC				
SC	Madera Canyon Creek	Tributary to the Santa Cruz River		A&Ww			FBC			FC		AgL
SC	Nogales Wash	Tributary to Potrero Creek		A&Ww				PBC				
SC	Oak Tree Canyon	Tributary to Cienega Creek			A & We			PBC				
SC	Palisade Canyon Creek	Tributary to Sabino Canyon Creek	A&Wc				FBC			FC		
SC	Paradise Lake	Near Arizona City		A&Ww			FBC			FC	AgI	
SC	Pantano Wash	Tributary to Tanque Verde Creek			A & We			PBC				
SC	Parker Canyon Creek	Tributary to Parker Canyon Lake		A&Ww			FBC			FC		
SC	Parker Canyon Lake	31°25'35"/110°27'15"	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SC	Patagonia Lake	31°29'30"/110°52'00"	A&Wc				FBC		DWS	FC	AgI	AgL
SC	Peña Blanca Lake	31°24'12"/111°05'04"	A&Wc				FBC			FC	AgI	AgL
SC	Potrero Creek	Headwaters to Interstate 19			A&We			PBC				AgL
SC	Potrero Creek	Below Interstate 19		A&Ww			FBC			FC		AgL
SC	Puertocito Wash	Tributary to Altar Wash			A&We			PBC				
SC	Redrock Canyon Creek	Tributary to Sonoita Creek		A&Ww			FBC			FC		
SC	Rillito Creek	Tributary to the Santa Cruz River			A&We			PBC				AgL
SC	Romero Canyon Creek	Tributary to Cañada del Oro	A&Wc				FBC			FC		
SC	Rose Canyon Creek	Tributary to Rose Canyon Lake		A&Ww			FBC			FC		
SC	Rose Canyon Lake	32°23'13"/110°42'38"	A&Wc				FBC			FC	AgI	AgL
SC	Sabino Canyon Creek	Tributary to Tanque Verde Creek	A&Wc				FBC		DWS	FC	AgI	
SC	Salero Ranch Tank	31°35'42"/110°53'22"		A&Ww			FBC			FC		AgL
SC	Santa Cruz River	Headwaters to the International Boundary		A&Ww			FBC			FC	AgI	AgL
SC	Santa Cruz River	International Boundary to the Nogales International WWTP outfall		A&Ww			FBC		DWS	FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SC	Santa Cruz River (EDW)	Nogales International WWTP outfall to the Tubac Bridge				A&We dw		PBC				AgL
SC	Santa Cruz River	The Tubac Bridge to Roger Rd WWTP outfall			A&We			PBC				AgL
SC	Santa Cruz River (EDW)	Roger Road WWTP outfall to Baumgartner Road				A&We dw		PBC				
SC	Santa Cruz River (Wash)	Baumgartner Road to the Gila River Indian Reservation			A&We			PBC				AgL
SC	Santa Cruz River, West Branch	Tributary to the Santa Cruz River			A&We			PBC				AgL
SC	Santa Cruz River, N. Fork	Tributary to the Santa Cruz River			A&We			PBC				
SC	Santa Rosa Wash	Below Papago Indian Reservation			A&We			PBC				
SC	Soldier Lake	32°25'34"/110°44'41"	A&Wc				FBC			FC		AgL
SC	Sonoita Creek	Headwaters to 1 km downstream of the State Route 82 bridge			A&We			PBC				AgL
SC	Sonoita Creek	1 km downstream of the State Route 82 bridge to the Town of Patagonia WWTP outfall		A&Ww			FBC			FC		AgL
SC	Sonoita Creek (EDW)	Town of Patagonia WWTP outfall to 750 feet downstream of outfall				A&We dw		PBC				AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SC	Sonoita Creek	Below 750 feet downstream of Town of Patagonia WWTP outfall		A&Ww			FBC			FC	AgI	AgL
SC	Split Tank	31°28'15"/111°05'15"		A&Ww			FBC			FC		AgL
SC	Sutherland Wash	Tributary to Cañada del Oro			A & W e			PBC				
SC	Sycamore Reservoir	32°20'57"/110°44'52"	A&Wc				FBC			FC		AgL
SC	Tanque Verde Creek-	Headwaters to Wentworth Road		A&Ww			FBC			FC		AgL
SC	Tanque Verde Creek	Below Wentworth Road			A & W e			PBC				AgL
SC	The Lake Tank	32°54'14"/111°04'14"		A&Ww			FBC			FC		AgL
SC	Three R Canyon	Headwaters to bottom of perennial reach		A&Ww			FBC			FC		
SC	Three R Canyon	Bottom of perennial reach to Sonoita Creek			A & W e			PBC				
SC	Tinaja Wash	Eastern foothills, Sierrita Mountains			A & W e			PBC				AgL
SC	Unnamed Wash (EDW)	Oracle Sanitary District WWTP outfall to 5 km downstream				A& We dw		PBC				
SC	Vekol Wash	Tributary to Santa Cruz Wash			A & W e			PBC				
SC	Williams Ranch Tanks	31°55'15"/110°25'30"		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SP	Aravaipa Creek	Headwaters to Stowe Gulch		A&Ww			FBC		DWS	FC		AgL
SP	Aravaipa Creek (U)	Stowe Gulch to downstream boundary of Aravaipa Canyon Wilderness Area		A&Ww			FBC		DWS	FC		AgL
SP	Aravaipa Creek	Below downstream boundary of Aravaipa Canyon Wilderness Area		A&Ww			FBC		DWS	FC		AgL
SP	Babocomari Creek	Tributary to the San Pedro River		A&Ww			FBC			FC		AgL
SP	Bass Canyon Creek	Muleshoe Preserve		A&Ww			FBC			FC		
SP	Bass Canyon Tank	32°24'00"/110°13'00"		A&Ww			FBC			FC		AgL
SP	Blacktail Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Booger Creek	Tributary to Aravaipa Creek		A&Ww			FBC			FC		AgL
SP	Buehman Canyon Creek (U)	Headwaters to approximately 9.8 miles downstream at 32°24'31.5" N 110°32'08" W		A&Ww			FBC			FC		AgL
SP	Buehman Canyon Creek	Below 32°24'31.5" N 110°32'08" W		A&Ww			FBC			FC		AgL
SP	Bull Tank	32°31'15"/110°12'45"		A&Ww			FBC			FC		AgL
SP	Carr Canyon Creek	Tributary to the San Pedro River	A&Wc				FBC			FC		AgL
SP	Copper Creek	Headwaters to Prospect Canyon		A&Ww			FBC			FC		AgL
SP	Copper Creek	Below Prospect Canyon			A&We			PBC				AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES								
SP	Deer Creek	Tributary to Aravaipa Creek		A&Ww			FBC			FC		AgL
SP	East Gravel Pit Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Fly Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Fourmile Creek	Tributary to Aravaipa Creek		A&Ww			FBC			FC		AgL
SP	Garden Canyon Creek	Eastern Slope, Huachuca Mountains		A&Ww			FBC		DWS	FC	AgI	
SP	Golf Course Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Gravel Pit Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Hidden Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Horse Camp Creek	Tributary to Aravaipa Creek		A&Ww			FBC			FC		AgL
SP	Hot Springs Canyon Creek	Muleshoe Preserve		A&Ww			FBC			FC		AgL
SP	Lower Garden Canyon Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Miller Canyon Creek	Eastern Slope, Huachuca Mountains	A&Wc				FBC		DWS	FC		AgL
SP	Oak Grove Creek	Tributary to Turkey Creek; Aravaipa Basin		A&Ww			FBC			FC		AgL
SP	Officers Club Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Parsons Creek	Tributary to Aravaipa Creek		A&Ww			FBC			FC		AgL
SP	Ramsey Canyon Creek	Huachuca Mountains	A&Wc				FBC		DWS	FC	AgI	AgL
SP	Rattlesnake Canyon	Tributary to Aravaipa Creek		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES								
SP	Redfield Canyon Creek	Southwest slope, Galiuro Mountains		A&Ww			FBC			FC		AgL
SP	San Pedro River	U.S./Mexico Border to Redington		A&Ww			FBC			FC	AgI	AgL
SP	San Pedro River	Redington to the Gila River		A&Ww			FBC			FC		AgL
SP	Swamp Springs Canyon Creek	Muleshoe Preserve		A&Ww			FBC			FC		
SP	Sycamore Pond I	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Sycamore Pond II	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SP	Turkey Creek	Tributary to Aravaipa Creek		A&Ww			FBC			FC	AgI	AgL
SP	Unnamed Wash (EDW)	Mt. Lemmon WWTP outfall to 0.25 km downstream				A&We dw		PBC				
SP	Virgus Creek	Tributary to Aravaipa Creek		A&Ww			FBC			FC		AgL
SP	Walnut Gulch (EDW)	Tombstone WWTP outfall to the confluence of Tombstone Gulch				A&We dw		PBC				
SP	Woodcutters Pond	Fort Huachuca Military Reservation		A&Ww			FBC			FC		
SR	Ackre (Judge) Lake	33°37'00"/109°20'37"	A&Wc				FBC			FC	AgI	AgL
SR	Apache Lake	33°35'30"/111°20'30"	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Barnhardt Creek	Tributary to Rye Creek; Mazatzal Wilderness		A&Ww			FBC			FC		AgL
SR	Basin Lake	33°55'00"/109°26'05"	A&Wc				FBC			FC		AgL
SR	Bear Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL
SR	Bear Wallow Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SR	Bear Wallow Creek, North Fork	Tributary to Bear Wallow Creek	A&Wc				FBC			FC		AgL
SR	Bear Wallow Creek, South Fork	Tributary to Bear Wallow Creek	A&Wc				FBC			FC		AgL
SR	Beaver Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL
SR	Big Lake	33°52'45"/109°25'00"	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River	Tributary to the Salt River	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, East Fork	Tributary to the Black River	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, N Fork of E Fork	Tributary to Black River, East Fork	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, West Fork	Tributary to the Black River	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Bloody Tanks Wash	Headwaters to Schultze Ranch			A&We			PBC				AgL
SR	Bloody Tanks Wash	Schultze Ranch to Miami Wash			A&We			PBC				
SR	Boggy Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL
SR	Boneyard Creek	Tributary to Black River, East Fork	A&Wc				FBC			FC	AgI	AgL
SR	Boulder Creek	Tributary to LaBarge Creek		A&Ww			FBC			FC		

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SR	Campaign Creek	Tributary to Roosevelt Lake		A&Ww			FBC			FC		AgL
SR	Canyon Creek	Tributary to the Salt River	A&Wc				FBC		D W S	FC	AgI	AgL
SR	Canyon Lake	33°33'15"/111°26'30"	A&Wc				FBC			FC	AgI	AgL
SR	Centerfire Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL
SR	Chambers Draw Creek	Tributary to Black River, N Fork of E Fork	A&Wc				FBC			FC		AgL
SR	Cherry Creek	Tributary to the Salt River	A&Wc				FBC			FC	AgI	AgL
SR	Christopher Creek	Tributary to Tonto Creek	A&Wc				FBC			FC	AgI	AgL
SR	Cold Spring Canyon Creek	Tributary to Cherry Creek	A&Wc				FBC			FC		
SR	Conklin Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL
SR	Coon Creek	Salt River Canyon Wilderness Area	A&Wc				FBC			FC		AgL
SR	Corduroy Creek	Tributary to Fish Creek, Apache National Forest	A&Wc				FBC			FC	AgI	AgL
SR	Coyote Creek	Tributary to the Black River, East Fork	A&Wc				FBC			FC	AgI	AgL
SR	Crescent Lake	33°54'36"/109°25'08"	A&Wc				FBC			FC	AgI	AgL
SR	Deer Creek	Tributary to the Black River, East Fork	A&Wc				FBC			FC		AgL
SR	Del Shay Creek	Tributary to Gun Creek, Del Shay Basin		A&Ww			FBC			FC		AgL
SR	Devils Chasm Creek	Tributary to Cherry Creek	A&Wc				FBC			FC		
SR	Dipping Vat Reservoir	33°55'54"/109°25'15"		A&Ww			FBC			FC		AgL
SR	Double Cienega Creek	Tributary to Fish Creek	A&Wc				FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SR	Fish Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL
SR	Fish Creek	Superstition Wilderness Area		A&Ww			FBC			FC		
SR	Gold Creek	Tributary to Tonto Creek		A&Ww			FBC			FC		AgL
SR	Gordon Canyon Creek	Tributary to Haigler Creek	A&Wc				FBC			FC		AgL
SR	Haigler Creek	Tributary to Tonto Creek; Hellsgate Wilderness	A&Wc				FBC			FC	AgI	AgL
SR	Hannagan Creek	Tributary to Beaver Creek	A&Wc				FBC			FC		AgL
SR	Hay Creek	Tributary to the Black River, West Fork	A&Wc				FBC			FC		AgL
SR	Home Creek	Tributary to the Black River, West Fork	A&Wc				FBC			FC		AgL
SR	Horse Creek	Tributary to the Black River, West Fork	A&Wc				FBC			FC		AgL
SR	Horse Camp Creek	Tributary to Cherry Creek	A&Wc				FBC			FC		AgL
SR	Horton Creek	Tributary to Tonto Creek	A&Wc				FBC			FC	AgI	AgL
SR	Houston Creek	Tributary to Tonto Creek		A&Ww			FBC			FC		AgL
SR	Hunter Creek	Tributary to Christopher Creek	A&Wc				FBC			FC		AgL
SR	LaBarge Creek	Superstition Wilderness Area		A&Ww			FBC			FC		
SR	Lake Sierra Blanca	33°52'25"/109°16'05"	A&Wc				FBC			FC	AgI	AgL
SR	Miami Wash	Tributary to Pinal Creek			A&We			PBC				
SR	Mule Creek	Tributary to Canyon Creek	A&Wc				FBC		DWS	FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters												
BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SR	Open Draw Creek	Tributary to the Black River, East Fork	A&Wc				FBC			FC		AgL
SR	P B Creek	Tributary to Cherry Creek	A&Wc				FBC			FC		AgL
SR	Pinal Creek	Headwaters to confluence with unnamed EDW wash (Globe WWTP)			A&We			PBC				AgL
SR	Pinal Creek (EDW)	Below unnamed EDW wash to Radium				A&Wedw		PBC				
SR	Pinal Creek	Radium to Setka Ranch			A&We			PBC				AgL
SR	Pinal Creek	Setka Ranch to Salt River		A&Ww			FBC			FC		AgL
SR	Pine Creek	Superstition Wilderness Area		A&Ww			FBC			FC		
SR	Pinto Creek	Tributary to the Salt River		A&Ww			FBC			FC	AgI	AgL
SR	Pueblo Canyon Creek	Tributary to Cherry Creek	A&Wc				FBC			FC		AgL
SR	Reavis Creek	Tributary to Pine Creek		A&Ww			FBC			FC		
SR	Reservation Creek	Tributary to the Black River	A&Wc				FBC			FC	AgI	AgL
SR	Reynolds Creek	Tributary to Workman Creek	A&Wc				FBC			FC		AgL
SR	Riverview Park Lake	Dobson Road & 8th Street; Mesa		A&Ww				PBC		FC		
SR	Roadrunner Park Lake	36th Street & Cactus; Phoenix		A&Ww				PBC		FC		
SR	Roosevelt Lake	33°40'45"/111°09'15"		A&Ww			FBC		DWS	FC	AgI	AgL
SR	Rye Creek	Tributary to Tonto Creek		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SR	Saguaro Lake	33°34'00"/111°32'06"	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Salome Creek	Tributary to the Salt River	A&Wc				FBC			FC	AgI	AgL
SR	Salt River	Above Roosevelt Lake		A&Ww			FBC			FC	AgI	AgL
SR	Salt River	Theodore Roosevelt Dam to the Verde River	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Salt River	Confluence of Verde River to Granite Reef Dam		A&Ww			FBC		DWS	FC	AgI	AgL
SR	Salt River	2 km below Granite Reef Dam to I-10 bridge			A&We			PBC				
SR	Salt River	I-10 bridge to the 23rd Ave WWTP outfall		A&Ww				PBC		FC		
SR	Salt River (EDW)	23rd Ave WWTP outfall to confluence with Gila River				A&Wedw		PBC		FC	AgI	AgL
SR	Slate Creek	Tributary to Tonto Creek		A&Ww			FBC			FC		AgL
SR	Spring Creek	Tributary to Tonto Creek	A&Wc				FBC			FC		AgL
SR	Stinky Creek	Tributary to the Black River, West Fork	A&Wc				FBC			FC		AgL
SR	Thomas Creek	Tributary to Beaver Creek	A&Wc				FBC			FC		AgL
SR	Thompson Creek	Tributary to the Black River, West Fork	A&Wc				FBC			FC		AgL
SR	Tonto Creek	Tributary to Roosevelt Lake	A&Wc				FBC			FC	AgI	AgL
SR	Turkey Creek	Tributary to Rock Creek; Sierra Ancha Mtns		A&Ww			FBC			FC		
SR	Unnamed Wash (EDW)	Globe WWTP outfall discharge to Pinal Creek				A&Wedw		PBC				

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
SR	Wildcat Creek	Tributary to Centerfire Creek	A&Wc				FBC			FC		AgL
SR	Willow Creek	Tributary to Beaver Creek	A&Wc				FBC			FC		AgL
SR	Workman Creek	Tributary to Salome Creek	A&Wc				FBC			FC	AgI	AgL
UG	Apache Creek	Tributary to the Gila River		A&Ww			FBC			FC		AgL
UG	Ash Creek	Tributary to the Gila River	A&Wc				FBC			FC		AgL
UG	Bennett Wash (EDW)	ADOC-Safford WWTP outfall to the Gila River				A&We dw		PBC				
UG	Bitter Creek	Tributary to the Gila River		A&Ww				PBC		FC		
UG	Blue River	Tributary to the San Francisco River	A&Wc				FBC			FC	AgI	AgL
UG	Bonita Creek (U)	San Carlos Indian Reservation to the Gila River		A&Ww			FBC		DWS	FC		AgL
UG	Buckalou Creek	Tributary to Castle Creek	A&Wc				FBC			FC		AgL
UG	Campbell Blue Creek	Tributary to the upper Blue River	A&Wc				FBC			FC		AgL
UG	Castle Creek	Tributary to Campbell Blue Creek	A&Wc				FBC			FC		AgL
UG	Cave Creek (U)	Headwaters to Coronado National Forest boundary	A&Wc				FBC			FC	AgI	AgL
UG	Cave Creek	Below Coronado National Forest Boundary	A&Wc				FBC			FC	AgI	AgL
UG	Cave Creek, South Fork (U)	Tributary to Cave Creek; Chiricahua Mtns	A&Wc				FBC			FC	AgI	AgL
UG	Chase Creek	Headwaters to the Phelps-Dodge Morenci Mine		A&Ww			FBC			FC		AgL
UG	Chase Creek	Below Phelps-Dodge Morenci Mine			A&We			PBC				

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
UG	Chitty Canyon Creek	Tributary to Salt House Creek	A&Wc				FBC			FC		AgL
UG	Cima Creek	Tributary to Cave Creek; Chiricahua Mtns	A&Wc				FBC			FC		AgL
UG	Cluff Ranch Pond #1	32°48'55"/109°49'15"		A&Ww			FBC			FC	AgI	AgL
UG	Cluff Ranch Pond #2	32°49'15"/109°50'33"		A&Ww			FBC			FC	AgI	AgL
UG	Cluff Ranch Pond #3	32°48'20"/109°51'43"		A&Ww			FBC			FC	AgI	AgL
UG	Coleman Creek	Tributary to Campbell Blue Creek	A&Wc				FBC			FC		AgL
UG	Dankworth Ponds	32°43'15"/109°42'15"	A&Wc				FBC			FC		
UG	Deadman Canyon Creek	Tributary to the Gila River	A&Wc				FBC		DWS	FC		AgL
UG	Devils Canyon	Tributary to Mineral Creek		A&Ww			FBC			FC		
UG	Eagle Creek	Tributary to the Gila River; below Clifton	A&Wc				FBC		DWS	FC	AgI	AgL
UG	East Eagle Creek	Tributary to Eagle Creek	A&Wc				FBC			FC		AgL
UG	East Turkey Creek	Eastern slope, Chiricahua Mountains	A&Wc				FBC			FC		AgL
UG	Evans Pond	32°49'15"/109°51'15"		A&Ww			FBC			FC		
UG	Fishhook Creek	Tributary to the upper Blue River	A&Wc				FBC			FC		AgL
UG	Foote Creek	Tributary to the upper Blue River		A&Ww			FBC			FC		AgL
UG	Frye Creek	Eastern slope, Pinaleno Mountains	A&Wc				FBC			FC		AgL
UG	Frye Mesa Reservoir	32°45'13"/109°50'00"	A&Wc				FBC		DWS	FC		

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
UG	Gibson Creek	Tributary to Marijilda Creek	A&Wc				FBC			FC		AgL
UG	Gila River	New Mexico border to the San Carlos Indian Reservation		A&Ww			FBC			FC	AgI	AgL
UG	Grant Creek	Tributary to the upper Blue River	A&Wc				FBC			FC		AgL
UG	Judd Lake	33°51'15"/109°09'15"	A&Wc				FBC			FC		
UG	K P Creek	Tributary to the upper Blue River	A&Wc				FBC		DWS	FC		AgL
UG	Lanphier Canyon Creek	Tributary to the upper Blue River	A&Wc				FBC			FC		AgL
UG	Little Blue Creek	Tributary to the upper Blue River		A&Ww			FBC			FC		AgL
UG	Little Creek	Tributary to the San Francisco River	A&Wc				FBC			FC		
UG	Lower George's Reservoir	Near Alpine	A&Wc				FBC			FC		AgL
UG	Luna Lake	33°49'45"/109°05'15"	A&Wc				FBC			FC		AgL
UG	Marijilda Creek	Tributary to the Gila River	A&Wc				FBC			FC	AgI	AgL
UG	Markham Creek	Tributary to the Gila River		A&Ww			FBC			FC		AgL
UG	Pigeon Creek	Tributary to the lower Blue River		A&Ww			FBC			FC		AgL
UG	Raspberry Creek	Tributary to the upper Blue River		A&Ww			FBC			FC		
UG	Roper Lake	32°45'20"/109°42'11"		A&Ww			FBC			FC		
UG	San Francisco River	Headwaters to the New Mexico border	A&Wc				FBC			FC	AgI	AgL
UG	San Francisco River	New Mexico border to the Gila River		A&Ww			FBC			FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
UG	San Simon River	Tributary to the upper Gila River			A & We			PBC				AgL
UG	Sheep Tank	32°46'15"/109°48'08"		A&Ww			FBC			FC		AgL
UG	Smith Pond	32°49'09"/109°50'26"		A&Ww			FBC			FC		
UG	Squaw Creek	Tributary to Thomas Creek		A&Ww			FBC			FC		AgL
UG	Stone Creek	Tributary to the San Francisco River	A&Wc				FBC			FC	AgI	AgL
UG	Strayhorse Creek	Tributary to the Blue River	A&Wc				FBC			FC		
UG	Thomas Creek	Tributary to the upper Blue River		A&Ww			FBC			FC		AgL
UG	Tinny Pond	33°47'49"/109°04'23"		A&Ww			FBC			FC		AgL
UG	Turkey Creek	Tributary to Campbell Blue Creek	A&Wc				FBC			FC		AgL
UG	Unnamed Wash (EDW)	ADOC-Globe WWTP outfall to the San Carlos Reservation				A&We dw		PBC				
UG	Walnut Canyon Creek	Tributary to the upper Gila River		A&Ww			FBC			FC		
UG	White Canyon Creek	Tributary to Walnut Canyon Creek		A&Ww			FBC			FC		
VR	American Gulch	Headwaters to the Northern Gila County Sanitary District WWTP outfall (Payson)		A&Ww			FBC			FC	AgI	AgL
VR	American Gulch (EDW)	Northern Gila County Sanitary District WWTP outfall (Payson) to the East Verde River				A&We dw		PBC				
VR	Apache Creek	Tributary to Walnut Creek		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
VR	Ashbrook Wash	Headwaters to the Ft McDowell Reservation			A & W e			PBC				
VR	Aspen Creek	Near Prescott		A&Ww			FBC			FC		
VR	Bar Cross Tank	35°00'40"/112°05'34"		A&Ww			FBC			FC		AgL
VR	Barrata Tank	35°02'43"/112°24'17"		A&Ww			FBC			FC		AgL
VR	Bartlett Lake	33°49'00"/111°37'45"		A&Ww			FBC		D W S	FC	AgI	AgL
VR	Beaver Creek	Tributary to the Verde River	A&We				FBC			FC		AgL
VR	Big Chino Wash	Tributary to Sullivan Lake			A & W e			PBC				AgL
VR	Bitter Creek	Headwaters to the Jerome WWTP outfall discharge		A&Ww				PBC		FC		AgL
VR	Bitter Creek (EDW)	Jerome WWTP outfall discharge to 2.5 km downstream				A& We dw		PBC				
VR	Bitter Creek	Below 2.5 km downstream of the Jerome WWTP outfall discharge		A&Ww			FBC			FC	AgI	AgL
VR	Black Canyon Creek	Mingus Mountains		A&Ww			FBC			FC		AgL
VR	Bonita Creek	Tributary to Perley Creek; Tonto National Forest	A&We				FBC		D W S	FC		
VR	Bray Creek	Tributary to Webber Creek		A&Ww			FBC			FC		AgL
VR	Carter Tank	34°52'27"/112°57'28"		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
VR	Cereus Wash	Headwaters to the Fort McDowell Indian Reservation			A&We			PBC				
VR	Chase Creek	Tributary to the East Verde River	A&Wc				FBC		DWS	FC		
VR	Clover Creek	Tributary to headwaters of West Clear Creek	A&Wc				FBC			FC		AgL
VR	Colony Wash	Headwaters to the Fort McDowell Indian Reservation			A&We			PBC				
VR	Dead Horse Lake	34°45'00"/112°00'30"	A&Wc				FBC			FC		
VR	Deadman Creek	Tributary to Horseshoe Reservoir		A&Ww			FBC			FC		AgL
VR	Del Rio Dam Lake	34°48'55"/112°28'00"		A&Ww			FBC			FC		AgL
VR	Dry Beaver Creek	Tributary to Beaver Creek		A&Ww			FBC			FC	AgI	AgL
VR	Dude Creek	Tributary to the East Verde River	A&Wc				FBC			FC	AgI	AgL
VR	East Verde River	Tributary to the Verde River	A&Wc				FBC		DWS	FC	AgI	AgL
VR	Ellison Creek	Tributary to the East Verde River	A&Wc				FBC			FC		AgL
VR	Fossil Creek	Tributary to the Verde River		A&Ww			FBC			FC		AgL
VR	Fossil Springs	34°25'24"/111°34'25"		A&Ww			FBC		DWS	FC		
VR	Foxboro Lake	34°53'48"/111°40'00"		A&Ww			FBC			FC		AgL
VR	Fry Lake	35°03'45"/111°48'02"		A&Ww			FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
VR	Gap Creek	Tributary to the Verde River; Prescott National Forest	A&Wc				FBC			FC		AgL
VR	Garrett Tank	35°18'57"/112°42'16"		A&Ww			FBC			FC		AgL
VR	Goldwater Lake, Lower	34°29'55"/112°27'18"	A&Wc				FBC		DWS	FC		
VR	Goldwater Lake, Upper	34°29'51"/112°26'55"	A&Wc				FBC		DWS	FC		
VR	Granite Basin Lake	34°37'01"/112°42'16"		A&Ww			FBC			FC	AgI	AgL
VR	Granite Creek	Tributary to the Verde River		A&Ww			FBC			FC	AgI	AgL
VR	Heifer Tank	35°20'28"/112°32'56"		A&Ww			FBC			FC		AgL
VR	Hell Canyon Tank	35°05'00"/112°24'06"		A&Ww			FBC			FC		AgL
VR	Homestead Tank	35°21'23"/112°41'32"		A&Ww			FBC			FC		AgL
VR	Horse Park Tank	34°58'15"/111°36'29"		A&Ww			FBC			FC		AgL
VR	Horseshoe Reservoir	33°59'00"/111°42'30"		A&Ww			FBC			FC	AgI	AgL
VR	J.D. Dam Lake	35°04'01"/112°01'40"	A&Wc				FBC			FC	AgI	AgL
VR	Jacks Canyon Wash (EDW)	Big Park WWTP outfall to Dry Beaver Creek				A&Wedw		PBC				
VR	Lime Creek	Tributary to Horseshoe Reservoir		A&Ww			FBC			FC		AgL
VR	McLellan Reservoir	35°13'15"/112°17'05"		A&Ww			FBC			FC	AgI	AgL
VR	Meath Dam Tank	35°07'46"/112°27'35"		A&Ww			FBC			FC		AgL
VR	Mullican Place Tank	34°44'16"/111°36'08"		A&Ww			FBC			FC		AgL
VR	Oak Creek (U)	Tributary to the Verde River	A&Wc				FBC		DWS	FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
VR	Oak Creek, West Fork (U)	Tributary to Oak Creek	A&Wc				FBC			FC		AgL
VR	Odell Lake	34°56'02"/111°37'52"	A&Wc				FBC			FC		
VR	Peck's Lake	34°47'07"/112°02'30"	A&Wc				FBC			FC	AgI	AgL
VR	Perkins Tank	35°06'42"/112°04'08"	A&Wc				FBC			FC		AgL
VR	Pine Creek	Tributary to the East Verde River	A&Wc				FBC		DWS	FC	AgI	AgL
VR	Red Lake	35°12'19"/113°03'55"		A&Ww			FBC			FC		AgL
VR	Reservoir #1	35°13'05"/111°50'07"		A&Ww			FBC			FC		
VR	Reservoir #2	35°13'16"/111°50'36"		A&Ww			FBC			FC		
VR	Roundtree Canyon Creek	Tributary to Tangle Creek		A&Ww			FBC			FC		AgL
VR	Scholze Lake	35°11'53"/112°00'31"		A&Ww			FBC			FC		AgL
VR	Spring Creek	Tributary to Oak Creek		A&Ww			FBC			FC	AgI	AgL
VR	Steel Dam Lake	35°13'36"/112°24'51"	A&Wc				FBC			FC		AgL
VR	Stehr Lake	34°21'59"/111°40'00"		A&Ww			FBC			FC		AgL
VR	Stone Dam Lake	35°13'36"/112°24'16"	A&Wc				FBC			FC	AgI	AgL
VR	Stoneman Lake	34°46'44"/111°31'05"	A&Wc				FBC			FC	AgI	AgL
VR	Sullivan Lake	34°51'46"/112°27'41"		A&Ww			FBC			FC	AgI	AgL
VR	Sycamore Creek	Tributary to Verde River; Coconino National Forest	A&Wc				FBC			FC	AgI	AgL
VR	Sycamore Creek	Tributary to Verde River; Tonto National Forest		A&Ww			FBC			FC	AgI	AgL
VR	Tangle Creek	Tributary to the Verde River		A&Ww			FBC			FC	AgI	AgL
VR	Trinity Tank	35°27'44"/112°47'56"		A&Ww			FBC			FC		AgL
VR	Verde River	Above Bartlett Dam		A&Ww			FBC			FC	AgI	AgL
VR	Verde River	Below Bartlett Dam		A&Ww			FBC		DWS	FC	AgI	AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
VR	Watson Lake	34°35'15"/112°25'05"		A&Ww			FBC			FC	AgI	AgL
VR	Webber Creek	Tributary to the East Verde River	A&Wc				FBC			FC		AgL
VR	West Clear Creek	Tributary to the Verde River	A&Wc				FBC			FC		AgL
VR	Wet Beaver Creek	Tributary to Beaver Creek	A&Wc				FBC			FC	AgI	AgL
VR	Whitehorse Lake	35°07'00"/112°00'47"	A&Wc				FBC		DWS	FC	AgI	AgL
VR	Williamson Valley Wash	Headwaters to confluence with Mint Wash			A&We			PBC				AgL
VR	Williamson Valley Wash	Confluence of Mint Wash to 10.5 km dwnstm		A&Ww			FBC			FC		AgL
VR	Williamson Valley Wash	Below 10.5 km downstream of the Mint Wash confluence			A&We			PBC				AgL
VR	Williscraft Tank	35°11'23"/112°35'38"		A&Ww			FBC			FC		AgL
VR	Willow Creek	Tributary to Willow Creek Reservoir	A&Wc				FBC			FC		AgL
VR	Willow Creek Reservoir	34°36'17"/112°26'19"		A&Ww			FBC			FC	AgI	AgL
VR	Willow Valley Lake	34°41'08"/111°19'57"		A&Ww			FBC			FC		AgL
WP	Big Creek	Pinaleno Mountains	A&Wc				FBC			FC		AgL
WP	Goudy Canyon Creek	Pinaleno Mountains	A&Wc				FBC			FC		AgL
WP	Grant Creek	Pinaleno Mountains	A&Wc				FBC		DWS	FC		AgL
WP	High Creek	Galiuro Mountains		A&Ww			FBC			FC		AgL
WP	Moonshine Creek	Tributary to Post Creek	A&Wc				FBC			FC		AgL

Appendix B: Designated Uses of Arizona Surface Waters

BASIN	SEGMENT	LOCATION	DESIGNATED USES									
WP	Pinery Creek	Chiricahua Mountains		A&Ww			FBC		D W S	FC		AgL
WP	Post Creek	Tributary to Grant Creek	A&Wc				FBC			FC	AgI	AgL
WP	Riggs Flat Lake	32°42'27"/109°57'51"	A&Wc				FBC			FC	AgI	AgL
WP	Rock Creek	Tributary to Turkey Creek		A&Ww			FBC			FC		AgL
WP	Snow Flat Lake	32°39'09"/109°51'52"	A&Wc				FBC			FC	AgI	AgL
WP	Soldier Creek	Tributary to Post Creek; Coronado National Forest	A&Wc				FBC			FC		AgL
WP	Turkey Creek (formerly in UG)	Western slope, Chiricahua Mountains	A&Wc				FBC			FC	AgI	AgL
WP	Ward Canyon Creek	Tributary to Turkey Creek	A&Wc				FBC			FC		AgL
WP	Wilcox Playa	Sulphur Springs Valley		A&Ww			FBC			FC		AgL

~~ARTICLE 2. DISCHARGE LIMITATIONS~~

~~R18-11-202. Discharge Limitations for Phosphates~~

~~A. Any discharge of wastewater to Show Low Creek and tributaries upstream of an including Fools Hollow Lake shall not exceed 0.16 mg/l total phosphates as P.~~

~~B. Any discharge of wastewater to the following navigable waters shall not exceed 1.0 mg/l total phosphates as P.~~

~~1. San Francisco River and tributaries upstream of Luna Lake Dam.~~

~~2. White River and tributaries.~~

~~R18-11-203. Prohibitions on Discharge~~

~~The discharge of treated wastewater to Sabino Creek is prohibited.~~

~~R18-11-205. Discharges to ephemeral waters~~

~~The water quality standards that apply to effluent dominated waters shall be used to derive discharge limitations for a point source discharge to an ephemeral water. This provision does not apply to point source discharges of storm water.~~

NOTICE OF FINAL RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 13. DEPARTMENT OF ENVIRONMENTAL QUALITY
SOLID WASTE MANAGEMENT

1. **Sections Affected** / **Rulemaking Action**

Article 15	New Article
R18-13-1501	New Section
R18-13-1502	New Section
R18-13-1503	New Section
R18-13-1504	New Section
R18-13-1505	New Section
R18-13-1506	New Section
R18-13-1507	New Section
R18-13-1508	New Section
R18-13-1509	New Section
R18-13-1510	New Section
R18-13-1511	New Section
R18-13-1512	New Section
R18-13-1513	New Section
R18-13-1514	New Section
Appendix A	New Appendix

2. **The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):**
   Authorizing and Implementing Statutes: A.R.S. §§ 49-761(A)(1), 49-761(A)(6), and 49-203.

3. **The effective date of the rules:**
   April 23, 1996.

4. **A list of all previous notices appearing in the Register addressing the final rule:**
   Notice of Rulemaking Docket Opening:
   1 A.A.R. 96, February 17, 1995

   Notice of Proposed Rulemaking:
   1 A.A.R. 864, June 30, 1995

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

Name:	Lynn A. Keeling
Address:	Department of Environmental Quality 3033 North Central Avenue, 8th Floor Phoenix, Arizona 85012-2809
Telephone:	(602) 207-2223 or (800) 234-5677 ext. 2223 (Arizona only)
Fax:	(602) 207-2251
Name:	Martha L. Seaman
Address:	Department of Environmental Quality 3033 North Central Avenue, 8th Floor Phoenix, Arizona 85012-2809
Telephone:	(602) 207-2222 or (800) 234-5677 ext. 2222 (Arizona only)
Fax:	(602) 207-2251

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

Purpose

This rulemaking establishes a sewage sludge (biosolids) program administered by the Department of Environmental Quality (ADEQ), which will ensure the safety of public health and the environment during all activities related to the beneficial placement of biosolids on any land in Arizona.

The implementing authority for this rulemaking is found in A.R.S. § 49-761(A)(6), which is specific to agricultural lands, and A.R.S. § 49-761(A)(1), which authorizes ADEQ to define and prescribe reasonably necessary rules regarding storage, collection, transportation, and disposal of solid waste and reclamation of solid waste including garbage, trash, rubbish, manure and objection-

able wastes. Based on this authority, ADEQ is prescribing standards for the storage, collection, transportation, and disposal of biosolids, and land reclamation with biosolids. The rules also provide for inspecting premises, containers, processes, equipment and vehicles and for ordering abatement of any premises, containers, processes, equipment, or vehicles which are an environmental nuisance. These rules are not applicable to solid waste facilities which are exempt from A.R.S. § 49-762(H) or subject to regulation pursuant to A.R.S. § 49-762.

Biosolids are the by-products of the treatment of wastewater. Arizona generates a large quantity of biosolids which must be disposed of or used. Biosolids are produced by the more than 700 wastewater treatment plants operating in the state. Each resident is responsible for 64 pounds of biosolids produced annually. Biosolids may be used as a valuable soil conditioner when properly generated and land applied. This rule provides a regulatory program for the land application of biosolids in Arizona in an environmentally sound manner.

Relatively pollutant-free sewage sludge may be used as a valuable soil conditioner or fertilizer-type product. If used in this manner, the material is often referred to as "biosolids" rather than sewage sludge. The term "biosolids" distinguishes material which is beneficially reused from material which is contaminated and must, therefore, be disposed of in landfills or burned in incinerators. Nationally, approximately 36% of the sewage sludge generated by wastewater treatment plants is land applied as biosolids.

ADEQ encourages the beneficial use of biosolids, as a soil amendment and fertilizer, on land in Arizona. The state recognizes that biosolids, generated both in-state and out-of-state, are being land applied and that such activities improve the productivity and value of land throughout the state. The state also recognizes that the beneficial nature of biosolids is directly related to the quality of the material, which means that it must be relatively free of pollutants and potential pathogenic organisms.

Today's rule is permissive in so far as it does not require all biosolids be land-applied. Wastewater treatment plants still retain discretion to dispose of their sludges through a number of approved methods. However, if a person land-applies biosolids, then these biosolids rules must be followed.

The proposed rule appeared in the June 30, 1995, publication of the *Arizona Administrative Register*.

History

Since 1979, ADEQ has actively regulated land application of biosolids under its water quality and solid waste management authority (A.R.S. §§ 49-241, *et seq.* and 49-701, *et seq.*). During these 16 years, there have been no incidents involving the lawful application of biosolids which are known to have posed an actual or potential threat to either public health or the environment.

In 1979, ADEQ implemented a biosolids program through a series of guidelines regarding the elements of a land application plan of operation, application rates, management practices and self-monitoring conditions, enforced by the Waste Programs Division. In addition, since 1989, controls to prevent groundwater contamination were established in an aquifer protection program (APP) general permit for agricultural applications of wastewater sludges (see A.A.C. R18-9-128). All other land application requires an individual aquifer protection permit (see A.A.C. R18-9-201). In 1992, the legislature withdrew the use of guidelines for regulating solid waste, leaving the APP rules as the regulatory program for land application of sludge in Arizona.

On February 19, 1993, the EPA promulgated *Standards for the Use and Disposal of Sewage Sludge* (40 CFR 503), a comprehensive, risk-based series of standards and requirements that regulate sewage sludge, including biosolids which are land-applied [see 58 FR 9248, as revised on February 25, 1994 (59 FR 9098) and October 25, 1995 (60 FR 54768)].

Part 503 establishes minimum requirements for biosolids quality, land application sites, management practices, land-use restrictions, monitoring, recordkeeping, and reporting. These standards, found in 40 CFR 503 (Part 503), are implemented in Arizona by the EPA Region IX and have been effective since February 19, 1994. The Part 503 includes standards for the surface disposal and incineration of sewage sludge.

Today's rules establish a method to ensure that biosolids are kept free from harmful contamination. This rulemaking is to ensure consistency with Part 503, clarity of requirements, and compliance with Arizona statutes while tailoring the rules to unique environmental characteristics such as very acidic soils found in areas throughout Arizona. As a result, the final rule has additional criteria which is not found in Part 503.

Relationship of this rule and the Aquifer Protection Permit Program

ADEQ has regulated the land application of biosolids under statutorily authorized guidelines since 1979. In 1989 ADEQ created a program, based on statutory requirements, to prevent harmful discharges to the state's aquifers, known as the aquifer protection permit program (APP). ADEQ regulated the water protection elements of the agricultural application of biosolids under R18-9-128, which provided a general permit for agricultural applications taking place order certain conditions. All other applications of biosolids would have been required to apply for and receive an individual Aquifer Protection Permit.

To prevent land application of biosolids from being regulated by 2 regulatory programs, this rulemaking and a companion rulemaking affecting the APP Chapter and Article by repealing R18-9-128 and attempted to exempt land-application activities which comply with the new biosolids rules from also having to comply with APP requirements. A.R.S. § 49-250 authorizes a class exemption from APP, if the ADEQ director finds either that there is no reasonable probability of degradation of the aquifer, or that aquifer water quality will be maintained and protected because the discharges are regulated under another program that provides the same or greater aquifer water quality protection. The biosolids rule contains requirements that maintain and protect aquifer water quality by reducing the probability and regulating discharges. Standards carried over from APP are found in Management Practices, R18-13-1507, and Site Restrictions, R18-13-1508.

Simultaneously with the effective date of Chapter 13, Article 15, the aquifer protection permit rules should have been amended to make clear that in most cases, the regulation of the land application of biosolids has been transferred to Chapter 13, Article 15. However, the Council voted to return the repeal of R18-9-128, and the amendment to R18-9-105. This raises the possibility that regulated persons will be confused by 2 sets of rules purporting to regulate the land application of biosolids. Therefore, to ensure the regulated community understands which rules to follow, a footnote will appear in R18-9-105 and R18-9-128 indicating where the location of the exemption from APP. The Notice of Docket Opening and the Notice of Proposed Rulemaking to repeal and amend Chapter 9, Article 1 should appear in the same Arizona Administrative Register as the final rule for Article 15.

The regulations which maintain and protect the aquifer include application rates of pollutants, including nitrogen, depth to groundwater based on soil type (porosity), crop uptake of irrigation and pollutants, hydraulic loading of the soil, setbacks from wells, and site restrictions. Regulated pollutants have been updated from APP based upon Part 503 and a court decision. The depth to groundwater has been modified in consideration of the risk analysis performed by the EPA which was based on more shallow depths than allowed under APP.

Part 503 does not expressly state a required depth to groundwater for land application of biosolids. The biosolids rule retains a depth to groundwater which has been modified from 40 feet in R18-9-128, to different depths depending upon the type of biosolids that are land applied. The biosolids rule allows biosolids with Class A pathogen reduction to be land applied where depth to groundwater is greater than 5 feet. Biosolids with Class B pathogen reduction may be applied where depth to groundwater is greater than 10 feet. The reason for modifying the depth to groundwater previously found in R18-9-128 is because this biosolids rule applies to all types of land application of biosolids, whereas R18-9-128 only applies to land application of biosolids on agricultural land. While ADEQ found reasonable cause to become less restrictive on the depth to groundwater, in order to maintain the integrity of aquifers and the environment, other areas of R18-9-128 could not be compromised. The APP general permit requires the cumulative loading of 5 metals be tracked, regardless of the concentration of the metals in the biosolids. Part 503 requires analysis of additional metals, however, the tracking of metal accumulation may be waived based on the concentration of metals in the biosolids. Therefore, the biosolids rule will require analysis and tracking the accumulation of 10 metals. The crop uptake and irrigation standards remain the same as APP and conform to Part 503. The hydraulic loading of the soil was retained for land application of liquid biosolids. The loading rate of nitrogen is key to the protection of aquifers and is limited to agronomic rates.

Exceptions for land application that cannot meet the requirements found in R18-13-1507, Management Practices, such as nitrogen loading for reclamation, may be granted through the permit process in APP. An individual APP permit will be required to establish alternative management practices. In addition, the individual APP permit will stipulate that all other requirements found in Article 15 be met.

Primacy

ADEQ intends to obtain primacy from the EPA for implementation of a biosolids program by promulgating these rules. This means that ADEQ will be the primary agency to enforce land application of biosolids. To obtain primacy, ADEQ must adopt rules that are as protective as the Part 503. Although Part 503 contains the regulations that any applicator, disposer, or incinerator of biosolids must follow, ADEQ is adopting rules for only land application of biosolids in this rulemaking. The EPA can authorize primacy with this rulemaking. The regulated community has indicated support that ADEQ obtain primacy of this program. ADEQ plans subsequent rulemakings to include incineration and disposal of biosolids at a future time. ADEQ intends to obtain primacy from the EPA for implementation of all aspects of Part 503.

Section-by-Section Explanation of the Final Rule

R18-13-1501 Applicability

This rulemaking only addresses a portion of the 40 CFR 503 provisions, as the rule only regulates land application activities. Incineration and disposal of biosolids will be addressed in later rulemakings. As in Part 503, this rule does not regulate the generation or treatment of biosolids. It does not mandate a particular stabilization method, or drying process or specify a minimum solids content. Rather, today's rule controls the placement of the final biosolids material on land and ensures it is done in a manner which protects public health and the environment to an ample margin of safety.

This rule will affect any person who generates biosolids and prepares them for land application. A person prepares biosolids for land application by digesting, thickening, drying, and treating for pathogen and vector attraction reduction. A person who blends biosolids from 2 or more sources or with materials other than biosolids (e.g., organic composts) is also considered to be a person who prepares biosolids for land application.

Land application includes the placement of either bulk or bagged biosolids on land in order to take advantage of the material as a soil conditioner and nutrient fertilizer. It does not include biosolids placed on the land for purposes of disposal only. Land application sites include agricultural fields, parks, gardens, lawns, nurseries, tree farms, golf courses, cemeteries, sports fields, pasture land, rangeland, forests, and reclamation sites. Persons engaged in these activities will be required to do so in conformance with the application rates, siting criteria and operational practices in this rule. Moreover, records of these activities are required, and reports periodically submitted to ADEQ.

The rule also affects persons who transport biosolids to a storage area, blending facility, or land application site. The rule requires that such transport be done in a manner which will prevent spills; and in the event a spill occurs, the rule specifies reporting duties as well as mitigation steps. The Applicability Section is a subset of Part 503, tailored to Arizona. The biosolids rule includes generators and applicators of biosolids for land application only. As previously discussed, Part 503 also includes incineration and surface disposal of biosolids.

This rule imposes some minor duties on the part of certain owners or lessees of land application sites. Depending on the quality of the biosolids, this rule may include waiting periods for harvesting crops and, if such restrictions are still in effect at the time of the property transfer, informing persons with succeeding property interests of the restrictions.

This rule does not address facilities used to treat or improve the quality of biosolids. ADEQ's objective is to regulate the final use of this material. However, it should be noted that facilities and structures used to store or treat sewage sludge, including biosolids, will continue to be regulated as solid waste storage or treatment facilities under A.R.S. Title 49, Chapter 4, Article 4, and those facilities, such as compost or blending facilities which have a potential to discharge pollutants to groundwater, will continue to be required to obtain an individual aquifer protection permit unless exempted.

R18-13-1502 Definitions

R18-13-1502 parallels Part 503 definitions, but also includes terms that relate to water quality. These terms are "business day", "coarse fragment", "coarse or medium sand", "gravel", "privately owned treatment works", "publicly owned treatment works", and "sand". Additionally, "surface water" is tailored for Arizona. Additional terms defined for clarification include "applicator", "biosolids", "responsible official", "ton", and "vectors".

The term "biosolids," is not found in Part 503 which regulates sewage sludges. "Biosolids" did not emerge as the preferred term until after Part 503 was finalized. The following exclusions from the definition of biosolids adapt the rules to unique features of Arizona law and prevent dual regulation:

1. Biosolids which are hazardous waste;
2. Biosolids with concentration of polychlorinated biphenyls equal to or greater than 50 milligrams per kilogram of total solids (dry weight basis);
3. Special waste;
4. Biosolids generated during treatment of surface or ground water for drinking water;
5. Sludge generated by an industrial facility;
6. Commercial septage, industrial septage, or mixtures of domestic septage and commercial or industrial septage.
7. Grit and screenings

Today's rules exclude certain sludges which are more properly regulated by other environmental programs. Biosolids which test positive and exhibit 1 or more of the characteristics of hazardous waste will be regulated as a hazardous waste under A.R.S. § 49-901 *et seq.* and the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6921 *et seq.* Similarly, biosolids found to have a polychlorinated biphenyls (PCB) concentration of equal to or greater than 50 milligrams per kilogram of biosolids must be disposed of in compliance with the Toxic Substances Control Act (TSCA), 15 U.S.C. 2601 *et seq.*

Grit and screenings are more like municipal solid waste than sludge produced from the rest of the wastewater treatment processes. Therefore, these terms are not included in the definition of biosolids. Grit and screenings will continue to be regulated as a solid waste.

The standards in this rule are based on the risk assessment conducted by EPA. The EPA modeled the likely pollutant migration pathways and effects of hundreds of substances commonly found in biosolids. With the models, the EPA could then predict the levels at which human health or the environment might be adversely impacted. However, these studies were limited to substances commonly found in biosolids.

The EPA did not conduct similar studies on commercial or industrial sludges (i.e., residuals produced by the treatment of commercial or industrial wastewater). Therefore, EPA has deferred including the use and disposal of such residual sludges, or even biosolids mixed with these sludges, within the scope of Part 503. ADEQ followed EPA on this issue and is not including commercial or industrial sludges in the definition of biosolids for land application.

According to A.R.S. § 49-854(A)(12), by January 1, 1997, the director of ADEQ, after consultation with the Special Waste Advisory Committee, is to determine whether to designate certain identified sludges as "special wastes." ADEQ believes this rule will adequately regulate biosolids for beneficial purposes and that the additional safeguards provided by the special waste program, such as the need to manifest each load of special waste, are unnecessary.

R18-13-1503 General Requirements

This rule mandates that persons who prepare biosolids provide subsequent blenders, transporters or applicators with information on the quality of the biosolids they produce. This quality data includes information on pollutant analyses as well as any pathogen treatment and vector attraction reduction measures taken by the preparer, and the effectiveness of these measures.

This rule does not specify a nitrogen limit. The rule sets the agronomic rate for nitrogen as the upper limit for the amount of biosolids that can be land-applied. This limit on application rate will depend on such that the agronomic rate of a crop or other vegetation is exceeded. Consequently, while the rules do not expressly require the person who prepares biosolids to conduct a periodic analysis of nitrogen, the applicator will need such information in order to determine the agronomic rate for the crop or vegetation present or planned at the application site. This is necessary to prevent nitrates from migrating into the groundwater.

This Section conforms with Part 503.

R18-13-1504 Applicator Registration

R18-13-1504 requires anyone who land applies biosolids (regardless of whether the biosolids are generated or prepared in-state or out-of-state), to register with ADEQ. This continues the practice of notifying ADEQ about land application. For sites which have never had biosolids placed on them before, the applicator must, through a notice in a local newspaper in the area, inform the public of the intention to use the site for land application.

ADEQ will use this site-by-site inventory to determine the level of land application activity in the state and fulfill its oversight responsibilities. Registration is necessary for ADEQ to be able to identify the persons conducting land application at or near an area affected by environmental degradation and determine whether the biosolids may have caused or contributed to the problem.

Applicators are required to file a 1-time registration with ADEQ. The registration process allows the requisite documents to be filed by mail and does not require travel to ADEQ. The key element of the registration process is a disclosure of the sites which each applicator intends to use. This information will be important in assisting ADEQ in matching applicators to sites. Applicators wishing to use new sites will amend their previous filing.

The rule imposes a deadline for registration by June 15, 1996, for current applicators. ADEQ will respond to requests for registration within 15 days of receipt. For current applicators who have all pertinent information on file with ADEQ need not resubmit the requirements under R18-13-1504. No interruption of activity should occur as a result of this registration process, because the only verification performed by ADEQ is to ensure that the registration information is complete.

Applicator registration is unique to Arizona. This does not exist in Part 503. Applicator registration represents a new but reasonable burden for applicators of biosolids to agricultural lands. However, applicator registration is less burdensome than obtaining an individual Aquifer Protection Permit for land application of biosolids on non-agricultural land.

R18-13-1505 Pollutant Concentrations

R18-13-1505 regulates 10 metals commonly found in biosolids. One of the leading causes for concern regarding these metals is their potential to accumulate in the soil. In the past, the state has set very stringent quality limits on the amount of acceptable metals in biosolids. This rule is based on a recent EPA risk assessment which determined that some of the metals in biosolids do not transport easily and are not readily taken up by plants which receive biosolids applications. These metals may be safely applied at levels higher than allowed under the general APP permit, R18-9-128. However, to maintain equal protection to R18-9-128, the cumulative loading of each metal in the soil must be tracked.

ADEQ recognizes that tracking the loading rates for exceptional quality (EQ) material may be difficult if not impractical since EQ biosolids are sold to 3rd parties who transport and use the material without any oversight or control on the part of the producer. Therefore, this rule requires that EQ biosolids meet Class A pathogen reduction to eliminate site restrictions. Consequently, in addition to the ceiling concentration limits, the average monthly quality of exceptional quality biosolids will also be tracked and regulated (see Table 2 of R18-13-1505). Persons who prepare biosolids which are a poorer quality must maintain site restrictions and cumulative loading until additional sampling demonstrates a return to compliance. EQ biosolids satisfying Class A pathogen reduction, 1 of the vector attraction reduction processes (1 - 8), and Table 2 of R18-13-1505, need not track or demonstrate compliance with the loading rate requirements set out in Tables 3 and 4 of this Section, or with the management practices in R18-13-1507.

For biosolids which are not EQ biosolids, the rule requires 2 types of metals loading rates in addition to the ceiling concentration limits in Table 1. Loadings of biosolids will be tracked on 1) an annual, and 2) a cumulative or "lifetime" basis. This dual frequency serves several purposes. First, it alerts the state as to those sites which are used by more than 1 applicator. Second, it serves as an early warning for sites which are approaching the cumulative loading limits.

The state does not believe that this dual approach is burdensome since the annual applications must be recorded and tracked in order to determine compliance with the cumulative loading rates.

On November 15, 1994, several of the Part 503 limits were remanded to the EPA for further study and consideration [see *Leather Industries of America Inc. v. EPA*, 39 ERC 1865, (DC Cir.)] The case involved a review of the standards set for chromium and selenium. On October 25, 1995, Part 503 was revised to remove chromium from all 4 tables. ADEQ chose to retain chromium in Table 1. Selenium was not modified in the Part 503 tables, however the case supported the exemption for selenium in areas with low child occupancy.

Statutorily authorized guidelines required the recordkeeping and reporting of metal accumulation since 1979. R18-13-1505 requires cumulative pollutant rates to be calculated from 1979 if possible, rather than 1993, because land applicators of biosolids in Arizona should have been compiling this information and retaining it since 1979. ADEQ recognized that previously only 5 metals were tracked, therefore, the cumulative pollutant rates are expected to be calculated since 1979. ADEQ allows a representative soil sample whereas Part 503 only allows data from actual application events. ADEQ does not require background soil samples when biosolids have not been previously applied; this is similar to Part 503.

R18-13-1506 Pathogen Controls

Pathogenic organisms are of great concern to ADEQ. These microbes are commonly found in biosolids and can spread disease and illness if left uncontrolled. This rule has a 2-tiered approach. In the 1st, referred to as Class A pathogen reduction, the pathogens are treated to a level which do not require site restrictions. All biosolids to be bagged and are intended for home use must be treated to the Class A level.

Biosolids which meet the 2nd tier of control, referred to as biosolids with Class B pathogen reduction, have been treated to an acceptable threshold level for land application. However, to ensure land application of biosolids with Class B pathogen reduction is as safe as land application of biosolids with Class A pathogen reduction, additional restrictions are found in R18-13-1508. ADEQ anticipates that applicators will prefer the biosolids with Class A pathogen reduction because of the reduced requirements. Biosolids with more contaminants and pathogens than biosolids with Class B pathogen reduction may not be land applied in Arizona.

Biosolids with Class A and Class B pathogen reduction establish minimum organism densities. However, the method used to achieve compliance may vary. The rules include 11 alternative treatment techniques which have been proven to reach Class A densities. Similarly, there are 7 treatment techniques for Class B densities.

R18-13-1506 conforms to Part 503.

R18-13-1507 Management Practices

R18-13-1507 establishes requirements to protect public health and the environment from potential adverse effects of biosolids application other than those associated with metals accumulation and pathogens. Most of these requirements apply to sites where bulk biosolids are applied rather than bagged applications.

The management practices found in this Section are designed to ensure protection of groundwater to the same or greater extent as would be provided if the land application of biosolids were subject to the APP program. To accomplish this purpose, ADEQ reviewed and evaluated the aquifer protection measures found in the currently existing general permit for the agricultural application of sludge, R18-9-128. Some requirements were retained from R18-9-128. For example, the buffer zones around wells were included in this rule because many wells in Arizona still do not have proper casings. The buffer zone around living quarters is to ensure compliance with Arizona nuisance statutes. If ADEQ were to incorporate Part 503, the only buffer zone would be land application near watercourses. The depth to groundwater was modified based upon public comments. ADEQ has found the APP limitation of at least 40 feet for depth to groundwater is overly protective. However, ADEQ had to weigh concerns from the public about groundwater contamination and businesses wanting nothing more stringent than Part 503. To maintain clear protection of the groundwater while trying to come as close to Part 503 as possible, ADEQ used experience and knowledge about soil porosity to determine reasonable depth to groundwater.

More specifically, the biosolids rule has restrictions to prevent biosolids run-off. The management practices include the restriction of application from slopes greater than 6% and from frozen or snow-covered ground. R18-13-1507 protects groundwater by requiring minimum depths to an aquifer which must be observed. In addition, management practices contain buffers between land application and wells, minimizing over-irrigation, as well as specific procedures dependent upon crop growth and application rates. Excess nitrogen which is not used by the plants may migrate through the water column or soil, and contaminate the aquifer. The observance of agronomic rates is particularly important to protect groundwater integrity. To provide exceptions to these restrictions, ADEQ may approve an individual APP permit on a site specific basis.

ADEQ has typically encouraged appliers to disk or incorporate biosolids into the soil at each site. The APP rule, R18-9-128 required incorporation for all biosolids applied to agricultural land. This rule does not require that all biosolids be incorporated into the soil, principally to facilitate multiple types of biosolids applications on lands such as after a crop is planted. The only requirement in the biosolids rule to incorporate is when biosolids are applied within 1000 feet of a dwelling.

Persons who bag biosolids are required to develop a label or information sheet to be provided to the user. This label must contain the information required by Part 503. This rule requires no additional information beyond Part 503 in labelling to facilitate out-of-state distributors.

R18-13-1507 is very similar to Part 503 with modifications to tailor the rule to all possible types of land application. Exceptional quality biosolids are exempt from Management Practices in this rule, which conforms to Part 503.

The pH of 6.5 is included in the rule to prevent metals from becoming mobile in localized acidic soils in Arizona. EPA used a pH of 6.5 in modeling used to develop the rule; however, this is not in Part 503. ADEQ felt it was necessary to retain this requirement from R18-9-128 provided the soil and biosolids mixture has a pH of 6.5 or higher immediately after land application of biosolids.

The depth to groundwater has been modified from the APP general permit which required 40 feet depth, to different depths depending on the quality of the biosolids and the proximity to a well. Biosolids with Class A pathogen reduction may be land applied where the depth to groundwater is 5 feet in this rule, and for biosolids with Class B pathogen reduction is 10 feet unless the soil is highly granular. Part 503 does not expressly state a depth to groundwater requirement. ADEQ depends upon the analysis provided by the APP program to include this buffer zone.

ADEQ concurs with the Part 503 regulation to provide a 10 foot buffer from waterways. ADEQ provided for biosolids to be applied closer to surface water when the applicator prevents leaching of substances in concentrations that exceed water quality standards.

R18-13-1507(A)(5) and (6) establish buffers from public areas and wells. These APP requirements that have been relocated to this rule provide protection for the person who resides close to the land application, and protection for the many wells that still do not have proper casing.

R18-13-1507(A)(10) requires that a crop be grown when the agronomic rate is reached, which is when the nitrogen needs of the crop or vegetation have been met. Part 503 requires either that a crop be grown or the land must sit idle when this occurs.

R18-13-1507(A)(12) requires incorporation within 10 hours when land-applied near a home. This is to prevent a nuisance, and prevent direct contact with the residents.

R18-13-1508 Site Restrictions

Application sites which receive biosolids with Class B pathogen reduction must comply with several site and access restrictions in addition to the management practices described in R18-13-1507. The waiting period restrictions for crop harvesting, grazing, and public access are intended to protect humans, livestock, and wildlife from exposure to the pathogens until they no longer cause a concern.

Applicators must inform land owners and lessees of these restrictions. ADEQ requires land owners and lessees to verify receipt of the site restriction statement from the applicator. The land owner or lessee must inform a subsequent land owner and lessee if any of these restrictions will remain in effect after a property transfer.

Microbiological organisms will no longer be viable after the waiting periods set out in the rule. To avoid these waiting periods, preparers and applicators are encouraged to treat biosolids to a Class A or exceptional quality level. Persons found in violation of these restrictions are in violation of Article 15 and are subject to enforcement under the law and these rules.

R18-13-1508 conforms to Part 503 except for (C) which requires the land owners or leaseholders to provide a signature indicating receipt of the site restrictions.

R18-13-1509 Vector Attraction Reduction

Vectors are rodents and insects which may transport pathogenic organisms to other locations where humans, livestock and wildlife may be present. Vectors are naturally attracted to biosolids due to the high content of organic matter which serves as a food supply. The purpose of R18-13-1509 is to reduce the attractiveness of the biosolids by stabilizing the organic matter by halting or minimizing its decomposition.

The rule has 11 alternatives to reduce vector attraction. Two of these alternatives, incorporation and injection, are undertaken at the application site. They may be particularly helpful for agricultural sites which need to be plowed or disked shortly after or during application. All biosolids intended for home use must meet vector attraction reduction requirements before being placed in the bag or other container.

R18-13-1509 conforms with the substance of Part 503; however, the form has been modified to increase readability. Vector attraction reduction is written in a more logical format that is intended to be easier to follow than Part 503. In Part 503 each vector attraction reduction is written as an independent statement and contains a complete set of instructions. ADEQ intends to simplify the description of the procedures merely by eliminating redundancies found in Part 503. Except for the rewording, each procedure is written in the order it is found in Part 503.

R18-13-1510 Transportation

R18-13-1510 does not have a counterpart in Part 503. All transporters must take adequate steps to ensure that biosolids do not spill or leak. The requirements to prevent vector attraction and minimize pathogen control are an extension of R18-13-1506. If a spill occurs, a transporter of bulk biosolids must take mitigation steps to correct the problem and notify ADEQ of the circumstances surrounding the spill. These requirements refer to requirements that apply to transportation of solid waste under 18 A.A.C. 8.

R18-13-1511 Self-monitoring

While ADEQ intends to conduct random inspections of land application operations and periodically sample biosolids, compliance data collected and submitted by the regulated community is required for monitoring the program.

The monitoring frequencies correspond to the amount of biosolids that are land applied during each calendar year. In the event a preparer's biosolids are not land-applied during the calendar year (e.g., they are stockpiled or held in a lagoon), the preparer need not sample the quality of the biosolids. Similarly, if an applicator does not apply biosolids in a given year, that applicator would have no self-monitoring obligations. The amount of biosolids is calculated on a dry weight basis.

Monitoring of biosolids must be performed in a manner which provides a representative sample. When biosolids are stockpiled for a substantial part of the year but subsequently land-applied, preparers and applicators may choose to sample for metals as the pile accumulates (e.g., once a month) or sample all at once prior to land application. In the event the latter method is selected, 12 separate composite samples are required to be taken from the stockpile. This is done by separating or dividing the pile into 12 equal segments and extracting core samples from varying locations and depths around the pile (or throughout the lagoon). The cores must be combined for each segment and then the resulting 12 samples analyzed separately. These analyses should ensure that, taken together, these samples are representative of the overall quality of the biosolids.

Pathogen and vector attraction reduction monitoring need not occur throughout the year. In fact, in the case of pathogens, sampling should occur as close to land application as possible in order to ensure that pathogen regrowth does not occur. Since ADEQ believes there is no need to conduct periodic sampling for these parameters, ADEQ will accept a sample taken 2 to 3 weeks prior to application. The 2 or 3-week period is reasonable to obtain sampling results. Preparers or applicators who sample late or discover violations after the biosolids are land applied will not be able to raise their own untimely analysis as a defense to an enforcement action.

This rule allows a preparer or applicator to analyze biosolids samples using analytical methods from 3 sources. These include the Arizona Department of Health Services (DHS) methods for the analysis of solid waste, DHS methods for wastewater analysis, and

the federal methods set out in 40 CFR 503.8. In some cases, biosolids analysis may need to use methods from all 3 sources. For example, the Part 503 methods should be used for analysis of enteric viruses, helminth ova, *Salmonella sp.* bacteria and specific oxygen uptake. These methods may also be used for inorganic (metals) pollutants, fecal coliforms and solids. The state wastewater methods in R9-14-609, should be used for measuring nitrogen. The applicable DHS solid waste and wastewater methods may also be used for the metals and fecal coliform analysis.

This rule requires other operating parameters to be measured and tracked over time. Several of these, such as the time and temperature of pathogen and vector control treatment, must be collected on a continuous basis. For others, a 1-time description of the steps taken is all that is necessary. Still other requirements may be recorded using both approaches. For example, the description of how public access is denied can be prepared on a site-by-site basis if different, or on a general basis if always the same.

R18-13-1511 conforms to Part 503.

R18-13-1512 Recordkeeping

R18-13-1512 requires sampling records, and other data on the preparation, application and site management, be retained for a period of 5 years. However, documentation on cumulative loadings to specific application sites shall be retained permanently.

Part 503 requires all wastewater treatment facilities to maintain records. ADEQ does not have authority over all wastewater treatment facilities which generate biosolids that may be land-applied within Arizona. Therefore, ADEQ has placed the bulk of the burden on the applicator in order to have equivalent regulatory oversight and recordkeeping as Part 503. R18-13-1512 requires applicators of bulk biosolids to maintain records.

R18-13-1513 Reporting

If a preparer or applicator samples more frequently than the minimum required by the rules, the additional samples must also be reported to ADEQ. The purpose of this requirement is to prevent the regulated community from selecting favorable results over results showing noncompliance.

In addition to the "as needed" reports, ADEQ requires all applicators report on their activities for the previous calendar year (i.e., January through December) by February 19. All self-monitoring data must be submitted along with the amount of biosolids applied and the locations of each site in the annual report. Nothing in this reporting frequency restricts or precludes ADEQ from inspecting preparers or applicators and reviewing and copying these records at a reasonable time.

ADEQ selected this date for the annual report for 2 reasons. First, ADEQ believes that 7 weeks is sufficient time for preparers and applicators to compile their records into a report. Second, this date coincides with the date federal reports are due from Class I facilities under Part 503. For the convenience of the regulated community, ADEQ expects to produce and distribute a reporting form for these annual reports.

Applicators using a site which has reached 90% or more of its cumulative site life under Table 4 of R18-13-1505 are also required to report that information to ADEQ. This information is critical in preventing a subsequent applier from exceeding the cumulative loading for the site.

All transporters are required to report spills to ADEQ as soon as possible after a spill occurs. Similarly, applicators must inform land owners and lessees of the metals concentration, pathogen treatment levels (i.e., Class A or B) and loading rates used on each site. Furthermore, where Class B biosolids have been applied, applicators must provide ADEQ with evidence that the landowner or lessee has been informed of the site restrictions.

R18-13-1513 requires immediate reporting of spills, which is not required by Part 503.

R18-13-1513 exempts only applicators of exceptional quality biosolids from reporting to ADEQ when 90% of the cumulative pollutant loading rate has been reached at a site which conforms with Part 503.

R18-13-1514 Enforcement

These rules allow ADEQ personnel to enter the premises and inspect the records of persons regulated by these rules. The rule expressly provides for inspections of the preparer's facility. Additionally, ADEQ may inspect lands on which the biosolids have been applied. The rules specifically allow ADEQ to copy relevant records and collect samples of biosolids quality. These measures are necessary to maintain a viable compliance monitoring program which independently verifies the self-monitoring information reported by the applicator.

These rules will be self-implementing, that is, enforceable in the absence of a permit or other written communication from ADEQ. The failure to comply with any provision of these rules is a violation. Furthermore, in the event such noncompliance is continuous, each day of continued violation constitutes a separate and distinct violation.

The rules require applicators to take all reasonable steps to minimize any adverse consequences of violations. These mitigation steps are expected to be performed immediately upon discovery of the violation and need not be ordered by ADEQ.

ADEQ intends to enforce violations of these rules subject to the authority provided to it under the enforcement provisions of the solid waste management laws, set out as A.R.S. Title 49, Chapter 4, Article 5. Violations subject the offender to injunctive relief to compel compliance, civil penalties of up to $1,000 per day, per violation not to exceed $15,000 per violation, and possible criminal prosecution and imprisonment as a Class 2 misdemeanor. However, it should be noted that the federal Clean Water Act authorizes civil and criminal penalties of up to $25,000 per violation per day for violations of Part 503.

Appendix A

Appendix A conforms to the procedures to determine annual biosolids application rates in Part 503.

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 summary of the economic, small business, and consumer impact:**

ADEQ carried out a cost-benefit analysis of the impacts on the 3 groups of regulated entities -- owners and operators of wastewater treatment facilities (generators), transporters and land appliers of biosolids, and owners or leaseholders of land on which biosolids are applied for beneficial re-use. The analysis also examined impacts on externalities. ADEQ concludes, on the basis of the statistical evidence gathered, that the probable economic benefits of the rule outweigh its costs.

OVERVIEW

Land application of biosolids in Arizona is an economically viable industry. Generators with sufficient volumes of sludge or biosolids land apply the material in order to avoid the higher costs of landfilling, and the even higher potential costs of incineration and other alternatives. Generators contract with transporters and land applicators (applicators) to transport the treated material from holding areas and apply it on land generally owned by farmers and ranchers, with results that are highly favorable to the landowners. Land applications apply biosolids that are generated both in-state and out-of-state.

The objective of the Department's efforts in this rulemaking has been to protect public health and the environment. The economic evidence shows that land application also happens to be cost-effective for industry participants, both in the private and public sectors. The opportunity costs to municipality residents and taxpayers is lower for generators that land-apply. Thus, land application of biosolids provides both economic and environmental benefits.

Data gathering for this Economic Impact Statement (EIS) consisted primarily of a questionnaire survey mailed to 3 groups, generators (66.7% of the survey respondents), applicators (10.1%), and landowners and lessees (23.2%). The survey was supplemented by telephone interviews with experts in the field, and analysis of published data. The survey yielded close to a balanced perspective from the public and private sectors, although the reader's attention is drawn to the limitations of the survey.

EMPLOYMENT IMPACTS -- The survey identified 1,113 people in respondent organizations who are employed exclusively or directly in the various phases of biosolids waste management. Based on the latest employment data for Arizona, the payroll impact of this component of the waste management industry is estimated at $35.5 million annually. If more land application occurs in the State, this dollar figure is bound to increase.

STATE REVENUES -- ADEQ does not plan to assess any fees to implement the program. Hence, this rule will not increase the Department's revenues.

COST-BENEFIT ANALYSIS

A. WASTEWATER TREATMENT FACILITIES -- Managers and superintendents of generators who responded to the survey have a service population broadly covering about 3 quarters (74.1%) of the State's residents who, in 1994 was at about 4 million. The methods used by generators to dispose of biosolids is landfilling (41.3%), surface disposal(23.9%), land application (21.7%), septic tanks or leach lines (8.7%), and other (4.3%). These facilities process 11.3 billion gallons of wastewater annually, before de-watering and treatment. Although less than 25% of the generators who responded engage in land application, the majority of the material that is processed (close to 70%) is being land-applied.

Most of the biosolids that are generated in-state and land-applied come from the 3 metropolitan counties of Maricopa, Pima, and Yuma. The equivalent of at least 35,500 dry metric tons are land-applied, mostly on farms and ranchland.

COSTS: The survey asked respondents to identify the incremental (added) annual costs to comply with the rule; i.e., the difference between what is now being spent for compliance with existing 40 CFR 503 rules, and the amount that will be spent as a result of the proposed state rule. The projected itemized costs added up to $1,853,467.

One respondent identified $1.1 million, the largest single item, to purchase a digester (equipment used for pathogen treatment). But ADEQ staff believe that this 1-time cost is a requirement of the Part 503 regulations rather than the state rule. The City of Phoenix, whose 23rd Avenue and 91st Avenue facilities are the largest generators of land-applied biosolids in Arizona, projected a cost of between $150,000 to $300,000. Pima County and the City of Prescott projected costs of a slightly smaller magnitude. Subtracting the digester cost, generators are therefore anticipating combined annual compliance costs of about 3 quarters of a million dollars ($753,467).

BENEFITS: If land application were disallowed, or discouraged, facility owners would still have to pursue alternative disposal methods and shoulder all their attendant costs. Therefore, the cost-benefit questions do not pertain to applying versus not applying biosolids; rather, it is costs of applying versus costs of alternatives -- landfilling, incineration, ocean dumping and other potential costs -- that should be weighed.

To landfill its biosolids, the City of Phoenix would need to spend between $540,000 to $675,000 annually, based on the tonnage generated from its 2 facilities. Furthermore, to continue landfilling over the next decade, with projected increases in the volumes generated that are directly proportionate to Maricopa County's population increases, the total cost is estimated at $8.4 million; and could be as high as $10.1 million when calculated with inflation escalators. Projecting these figures to all biosolids currently being land-applied in the State, the total cost to landfill is estimated at $15.9 million.

B. TRANSPORTERS AND LAND APPLICATORS -- Applicators are mainly private sector companies, although a few municipalities also transport their treated biosolids for disposal or application purposes.

COSTS: Applicators projected annual incremental costs to comply at less than a quarter of a million dollars ($226,570). One company estimated $100,000 in lost revenues due to the following provisions of the rule: 1) the lack of recognition of all EQ (exceptional quality) materials as defined in Federal 503 rules; and 2) the restriction of operations to those with groundwater at greater than 10 feet. Other major costs are associated with required management practices, recordkeeping and site restrictions. Contingency costs, such as those that are due to accidental spills, are also analyzed but not included in the total costs because they may or may not occur.

BENEFITS: The benefits of land application to private sector companies lie in the profitability of the industry. ADEQ considered it highly unlikely that a direct question inquiring about the actual profits (in dollar terms) a company makes would elicit any response, since this tends to be very closely guarded information. But the concept of a fair rate of return, expressed in percentage terms, can usually be divulged in business circles without giving away any company secrets.

To the question: "What rate of return on investment did your company actually experience in the last calendar or fiscal year?", respondents gave answers ranging from a low of 4.5% to a high of 25%, with an average of 13%. This suggests that profit margins for the industry are higher than financial institutions' prime lending rates, which have been hovering around 8.75% to 9% recently. These rates of return attest to the economic viability of the industry.

C. LANDOWNERS AND LESSEES -- The principal economic beneficiaries of existing land application practices are farmers and ranchers who own or lease land on which the biosolids are applied.

COSTS: A majority of landowner respondents did not identify any costs to them as a result of the rule. But a few identified costs ranging from $1,000 to $30,000 for required management practices; and between $1,000 to $20,000 for site restrictions. The total came to $67,700.

BENEFITS: Increased farm yields, reduced fertilizer costs, and increased water conservation were the most frequently cited benefits of land application (the wastewater treatment facilities twice as many benefits compared to the costs while the farmers realized benefits at 12% times the costs) Water conservation and improved soil moisture retention are important for farmers who have to work with the arid climate and soil conditions of southern Arizona. Calculated average savings of $30,366 per respondent represents the difference between the cost of land application, and the cost to purchase comparable commercial fertilizers or soil conditioners for their land.

Asked to identify dollar benefits per acre, farmers gave answers ranging from a low of $5 to a high of $150, with an average of $50.56 per acre per year. The estimate for total savings to survey participants (who have controlling interests in only 3-tenths of 1% of all agricultural land in Arizona) is $775,641 annually. On the assumption that only 1% of agricultural land is currently applied with biosolids, the yearly benefits to landowners is estimated at $17.8 million. This does not include the benefits for land reclamation, for which no data could be obtained.

EXTERNALITIES: In cost-benefit analysis, externalities are entities that are not directly regulated by the rule, but will be directly or indirectly affected by what the rule requires. The costs and benefits to them will depend essentially on market dynamics, and on what process changes will occur as a result of the proposed rule. Survey results indicate that significant economic multiplier (ripple) effects could occur if land application were to increase significantly in Arizona.

A. Consultants, Contractors and Sub-contractors, Testing Laboratories -- Currently, a majority of generators and applicators have lab capability. Despite the existence of these labs, 72% of respondents anticipate that they will contract out for lab and other consulting services, indicating an active role for this group. If approved, the rule will mean more business for them.

B. Manufacturers and Distributors of Biosolids Equipment and Supplies -- Private sector companies that manufacture and distribute equipment and supplies for biosolids management will also experience more business, to the extent that more of these will be needed. Digesters, pathogen treatment chemicals, vehicle covers and leakproof vehicles, etc. will be required for the operation and maintenance of current as well as new processes.

C. Residents of Communities, Consumers and Taxpayers -- Residents served by generators will bear the incremental costs of the rule incurred by the generators unless the residents choose to pass these on to their applicators' contractors or landowners. The average cost increase in sewer fees for Maricopa County residents served by the City of Phoenix is estimated at $0.39 per household per year.

Residents of jurisdictions that do not land-apply, however, should see no change in their user fees. The increase in ADEQ staffing costs required by the rule ($93,000 a year) will be paid for by taxpayers.

Residents living in the vicinity of land applied biosolids will benefit from the more stringent requirements of the rule which are protective of human health and the environment. In addition, consumers of farm products will see some benefits in the form of cheaper produce if farmers choose to pass on their savings to the purchasers of their products.

9. **A description of the changes between the proposed rules, including supplemental notices, and final rules:**

The Concise Explanatory Statement contains all changes made to the rules between proposal and final. The Concise Explanatory Statement is on file at the Secretary of State and the Arizona Department of Environmental Quality.

The most significant comments and changes are noted in item #10 of this final rule.

10. **A summary of the principal comments and the agency response to them:**

THE FOLLOWING COMMENTS AND CHANGES WERE MADE BETWEEN NOTICE OF PROPOSED RULEMAKING AND RULE ADOPTION. AN ADDENDUM TO THESE COMMENTS AND THE AGENCY RESPONSE TO THEM INCLUDES ALL COMMENTS THAT RESULTED IN CHANGES AFTER RULE ADOPTION. ALL CHANGES TO THE ADOPTED RULE WERE APPROVED BY THE GOVERNOR'S REGULATORY REVIEW COUNCIL MEETING ON APRIL 2, 1996.

GENERAL COMMENTS

EXCEPTIONAL QUALITY BIOSOLIDS

ISSUE: ADEQ seems to have ignored EPA's values for Exceptional Quality (EQ) biosolids based on the 10-year risk assessment conducted for the 40 CFR 503 regulations. ADEQ only acknowledges composting as meeting the EQ criteria for biosolids, which means meeting 40 CFR 503.13, Table 3 for metals; Class A pathogen reduction; and 1 of the vector attraction reduction methods. The proposed rules add burdensome requirements on generators and applicators of EQ biosolids that would impede beneficial use of biosolids resources. Like EPA, ADEQ should give the EQ biosolids equal treatment with composted biosolids.

ANALYSIS: EPA's risk assessment is the foundation of the proposed rule package. ADEQ received many comments opposing ADEQ relying so heavily on the risk assessment. The adopted rule deviates from the federal rule to reflect the results of the court cases brought against the EPA, and other comments received supported this decision. The general aquifer protection permit (APP), R18-9-128, maintains site restrictions for all bulk biosolids applications, as well as, requiring metal accumulative tracking. ADEQ had to evaluate the equivalency of the APP program required by A.R.S. § 49-250 in order to exempt land application of biosolids from the APP program.

ADEQ recognizes the great value of producing EQ biosolids; however, ADEQ also recognizes that cumulative metal loading rates may be exceeded with the overuse of EQ material. Therefore, ADEQ believes that bulk EQ material should have, and will have under the rule, additional tracking requirements, while bagged EQ biosolids are treated the same as they are under Part 503. Bagged biosolids are generally applied in small quantities for fewer years than bulk biosolids. All bagged biosolids must meet Class A pathogen reduction and 1 of the vector attraction reduction controls in R18-13-1509(1) through (8). Again, some of the comments received support this determination.

ADEQ requires site restrictions for Class B biosolids to land-apply this material as safely as Class A. Class B biosolids may be further treated to reduce pathogens to a Class A pathogen reduction status, and would no longer have site restrictions. While ADEQ found it reasonable to become less restrictive than R18-9-128 in some management practice areas, in order to maintain equivalent protection with the APP program, the cumulative metal tracking is retained. The reason for this additional precaution, again, is to prevent cumulative metal loading rates from being exceeded.

ADEQ reviewed the requirements of the APP program and modified those requirements to provide a land application biosolids program that is economically feasible while protective of human health and the environment. To ensure ADEQ can monitor the program, reporting of all bulk land application of biosolids will be required in this rule. Therefore, ADEQ does not support the EQ exemption provided in Part 503.

RESPONSE: No change to the rule.

ISSUE: ADEQ appears to have shown favoritism towards composting as the "highest and best use" of biosolids. There does not appear to be any basis for this statement, and seems biased against other forms of EQ biosolids.

ANALYSIS: The phrase "highest and best use" in the preliminary preamble was somewhat misleading. ADEQ only intended to highlight this use for the following reasons:

1. Compost tends to be used in small quantities.
2. Compost is mixed with other products.
3. Compost contains bulking agents that dilute the metals.

ADEQ believes the process of composting by adding bulking materials so dilutes the metals that it makes it unnecessary to track it. Other forms of sludge do not have bulking agents, therefore, there is no dilution. The issue of compost is closely tied to the use of bulk EQ biosolids and comments on these issues have been closely examined to develop the protective rule which the Arizona public has demanded.

RESPONSE: No change to the rule; however, the preamble has been clarified to reflect the comment.

AUTHORITY

ISSUE: ADEQ's mandate under A.R.S. § 49-761(A)(6) was to adopt rules for the application of sludge "from a wastewater treatment facility, as defined in A.R.S. § 49-371(9). In §49-371, a "wastewater treatment facility" is defined as a facility "located in this state." Extra-territorially prepared biosolids are land applied in Arizona. The commenter believed that ADEQ failed to regulate extra-territorially prepared biosolids. The commenter additionally believed that the biosolids rules only applied to wastewater treatment facilities in Arizona.

ANALYSIS: The statutory authority for this rule is A.R.S. §§ 49-761(A)(1) and (6), and 49-203. Two of the cites were inadvertently omitted from the preamble. In any event, ADEQ does not have authority to regulate wastewater treatment facilities which are

located out-of-state. However, the sludge brought into Arizona will be regulated by these rules and tested by labs certified by the Arizona Department of Health Services under Title 36.

RESPONSE: No change to the rule. In the preamble the statutory authority has been corrected as follows:

Before: Authorizing statutes: A.R.S. §§ 41-1003 and 49-101

Implementing statutes: A.R.S. § 49-761(A)(6)

After: Authorizing and implementing statutes: A.R.S. §§ 49-761(A)(6), 49-761(A)(1), and 49-203

DUPLICATIVE, INCONSISTENT AND DUAL REGULATION

ISSUE: A.R.S. § 49-761(A)(6) states that ADEQ is required to "Consider other federal and state laws and rules in an effort to avoid practices or requirements that duplicate, are inconsistent with or will result in dual regulation with other rules and laws." Several commenters stated that the biosolids rules are inconsistent with federal regulations and create a dual program.

A state desiring to administer its own permit program for disposal of sewage sludge may do so in accordance with §402 of the Clean Water Act (which establishes the National Pollutant Discharge Elimination System Permit program), if program authority is delegated by EPA. If ADEQ was to receive delegation of the biosolids program, then there would not be dual regulation. However, ADEQ did not specifically state that delegation was intended.

ANALYSIS: The ADEQ biosolids program will not be duplicative or result in dual regulation when primacy is obtained from the EPA. ADEQ is preparing this rule for the purpose of receiving primacy. Any "inconsistencies" are changes requested by and for the benefit of the citizens of Arizona. ADEQ has considered Part 503 and modified it to ensure protection of human

health and the environment and to address local concerns.

RESPONSE: No change to the rule.

MANDATORY NATURE OF THE RULES

ISSUE: ADEQ states that the proposed rules "are permissive in nature." The rules do not require a permit, as do the federal rules. See 40 CFR 503.3.

ANALYSIS: The reference to the rules being "permissive" was intended only to convey that land application of biosolids is not the only method for final use and disposal. However, if land application is chosen as the disposal option, all of the requirements of the biosolids rule must be complied with.

All aspects of the program are self-implementing, no permit is required, at both the state and federal levels. 40 CFR 503.3 states that permits may be issued under Part 503, but are not required. Permits may also be issued pursuant to approved state programs under such federal laws as subtitle C of the Solid Waste Disposal Act; Part C of the Safe Drinking Water Act; the Marine Protection, Research, and Sanctuaries Act of 1972; or the Clean Air Act. However, this rule does not require a permit. It only requires that the rules' requirements be met whenever biosolids are land applied.

RESPONSE: No change to the rule.

NITROGEN RELEASES TO THE AQUIFER

ISSUE: Some commenters were concerned that ADEQ would allow a brief nitrogen release or "pulse" to the aquifer, as stated in the preliminary preamble. This could occur in the case of reclamation with biosolids when the agronomic rate is exceeded.

ANALYSIS: ADEQ has clarified the applicability Section, R18-13-1501, to direct the reader to comply with either the biosolids rule, or obtain an APP and comply with all biosolids requirements except R18-13-1507. The APP and biosolids programs protect the aquifer from the concern expressed by this commenter.

RESPONSE: Please see the discussion of R18-13-1501 and R18-13-1507 found later in this document.

R18-13-1501. Applicability

ISSUE: ADEQ decided on its own initiative to strike R18-13-1501(B).

ANALYSIS: The text of R18-13-1501(B)(1) through (7), have been re-located to the definition of "biosolids" found in R18-13-1502. In regard to subsection (B)(8), the location of storage and treatment of biosolids is regulated under other programs independently of this rule. Therefore, the subsection (B)(8) has been stricken in its entirety.

RESPONSE: R18-13-1501(B) has been amended as follows:

B. This Article shall not apply to the following:

1. Sludge determined to be hazardous in accordance with A.R.S. Title 49, Chapter 5, Article 2, and 40 CFR 261.
2. Sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry-weight basis).
3. Grit (e.g., sand, gravel, cinders, or other materials with a high specific gravity) or screenings generated during preliminary treatment of domestic sewage by a treatment works.

4. Sludge generated during the treatment of either surface water or groundwater used for drinking water.
5. Sludge generated by an industrial facility during the treatment of industrial wastewater, or industrial wastewater combined with domestic sewage.
6. Commercial septage, industrial septage, or mixtures of domestic septage and commercial and/or industrial septage.
7. Special wastes, as defined and controlled under A.R.S. Title 49, Chapter 4, Article 9.
8. Biosolids stored at or exempted from a solid waste facility under A.R.S. Title 49, Chapter 4, Article 4, or any biosolids stored for the primary purpose of treatment.

ISSUE: ADEQ decided on its own initiative to re-word R18-13-1501(C) and to add 2 new subsections describing the applicability of this Article.

ANALYSIS: R18-13-1501(C) has been re-written for clarity. The applicability Section did not clarify how variances to the land application of biosolids might be regulated by ADEQ. Therefore, specific citations as to which programs regulate any variation from the rule have been added, in the form of new subsections. The new subsections have been added to identify that application in accordance with this Article is exempt from the APP program. When the requirements of R18-13-1507, Management Practices, cannot be met, an individual aquifer protection permit may be issued for land application. However, all other Sections of this Article are always applicable.

RESPONSE: R18-13-1501 has been amended as follows:

~~C.~~B.~~Except as provided in R18-13-1507(A)(3),~~ The land application of biosolids in a manner consistent with this Article is exempt from the requirements of the aquifer protection program, as established by A.R.S. Title 49, Chapter 2, Article 3 and ~~Department rules adopted thereunder~~ A.A.C. Title 18, Chapter 9, Article 1.

C. Except as otherwise provided in subsection (D) of this Section, the land application of biosolids in a manner that is not consistent with this Article is prohibited.

D. The land application of biosolids in a manner which differs from any of the requirements in R18-13-1507 but is otherwise consistent with this Article may be permitted under the aquifer protection permit program established by A.R.S. Title 49, Chapter 2, Article 3, and A.A.C. Title 18, Chapter 9, Article 1.

R18-13-1502.Definitions

ISSUE: In the proposed rules, "rangeland" and "land used for pasture" have been deleted from the definition of agricultural land; however, this was not the intent of the Part 503 regulations. ADEQ should provide an explanation of why these 2 categories were deleted.

ANALYSIS: Part 503 does include "rangeland" and "land used as a pasture" in the definition of agricultural land. However, the phrase "agricultural land" is not used in the state rule, therefore its definition has been deleted. The state rule applies to all land on which biosolids are applied, including rangeland, land used as pasture, forests, agricultural land, etc. In addition, other terms that are not used in the rule have been deleted from the definitions.

RESPONSE: R18-13-1502 is amended as follows:

B. "Agricultural land" means land on which a food, feed, or fiber crop is grown.

M. "Coarse sandy loam" means a sandy loam soil with more than 50% of the sand sized particles retained on a No. 10 (2.00 mm) sieve.

W. "Fine sands" means soils with more than 50% of the particles passing through a No. 40 sieve.

RR. "Sandy Loam" means a class of soil texture that contains a balanced mixture of silt and clay and is composed of between 50 and 85% sand sized (>0.075 mm diameter) particles; and the clay content does not exceed 20%.

ISSUE: In R18-13-1502, "agronomic rate" is defined using "preventing" instead of "minimizing" in reference to nitrogen passing below the root zone. In practice, this implies that there should be a barrier at the root zone to prevent any nitrogen from passing below that level. This is impractical. ADEQ should use "minimizing" as used in the Part 503 regulations.

ANALYSIS: "Minimize" is used in Part 503. ADEQ agrees with the comment and has modified the definition.

RESPONSE: R18-13-1502(2) is amended to read:

~~C.~~2 "Agronomic rate" means the whole biosolids application rate ~~(~~ on a dry-weight basis ~~) designed to meet~~ which meets both of the following conditions:

a. ~~Provide the~~ The amount of nitrogen needed by existing vegetation or a planned or actual crop has been provided;~~, while~~ and

b. ~~Preventing nitrogen~~ The amount of nitrogen that ~~from passing~~ passes below the root zone of the crop ~~to the ground water~~ is minimized.

ISSUE: The term "hectare" used in R18-13-1502(E) "annual pollutant loading rate", should be defined in relation to acres; and

"metric ton" should be defined in relation to pounds or tons.

ANALYSIS: ADEQ agrees with the comment and has provided the conversions in the appendix.

RESPONSE: No change to R18-13-1502 in response to this comment. The following was added to Appendix A:

metric ton =1.102 short tons

hectare =2.471 acres

ISSUE: "Biosolids" should conform to definitions from other states so that standards and component material are consistent. Some suggested language would be: "Biosolids means the nutrient-rich processed organic material derived from wastewater treatment which is placed on the land in order to use the beneficial properties of the material as a soil amendment, conditioner, or fertilizer."

ANALYSIS: All states must meet the Part 503 definition of sewage sludge. ADEQ has defined "biosolids" in R18-13-1502(8) as "sewage sludge" [R18-13-1502(42)] in order to maintain the definition found in Part 503. However, the definition has been amended to reflect the biosolids to which the rule applies.

RESPONSE: No change to the rule in response to the comment. R18-13-1502(H) has been amended as follows:

~~H.~~7. "Biosolids" means sewage sludge, including composted biosolids, which is placed on, or applied to the land in order to use the beneficial properties of the material as a soil amendment, conditioner, or fertilizer. Biosolids do not include any of the following:

a. Sludge determined to be hazardous in accordance with A.R.S. Title 49, Chapter 5, Article 2, and 40 CFR 261.

b. Sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry-weight basis).

c. Grit (e.g., sand, gravel, cinders, or other materials with a high specific gravity) or screenings generated during preliminary treatment of domestic sewage by a treatment works.

d. Sludge generated during the treatment of either surface water or groundwater used for drinking water.

e. Sludge generated by an industrial facility during the treatment of industrial wastewater, or industrial wastewater combined with domestic sewage.

f. Commercial septage, industrial septage, or domestic septage combined with commercial or industrial septage.

g. Special wastes, as defined and controlled under A.R.S. Title 49, Chapter 4, Article 9.

ISSUE: ADEQ decided on its own initiative to change the definition of "compost".

ANALYSIS: ADEQ decided that the definition of "compost" did not explain the intent of its use in the rule.

RESPONSE: R18-13-1502 has been amended and renumbered as follows:

~~N.~~12. "Compost" or "composted biosolids" means biosolids which meet Class A pathogen reduction and which have undergone a controlled, aerobic, or anaerobic, high temperature, accelerated biological decomposition process which converts biosolids and other solid organic matter into a stable, humus-like mixture through the optimal growth and activity of naturally occurring, mixed populations of bacteria and fungi that are indigenous to the organic matter being composted.

ISSUE: One commenter stated a concern about the definition of "fiber crop." Since cottonseed is used for animal feed and cottonseed oil may be an ingredient in food intended for human consumption, cotton is more than just a fiber crop.

ANALYSIS: Under R18-13-1508, there are no site restrictions where Class A biosolids may be land applied. However, when Class B biosolids are land applied, fiber crops and food crops in which the harvested portion is wholly above the surface of the soil both have a 30-day restriction on the application of biosolids. When Class B biosolids are applied, cotton seeds may be used in products for human consumption if harvested after the 30-day restriction. R18-13-1508(A)(4) has been modified to reflect the restrictions on any food crops.

RESPONSE: No change to the definitions in R18-13-1502. R18-13-1508(A)(4) has been amended as follows:

4. Food, feed, and fiber crops shall not be harvested for 30 days after application.

ISSUE: One commenter suggested the following language for the definition of "person who prepares sewage sludge": "...or the person who derives a new product from the biosolids either through processing or by combining it with another material, including blending several biosolids together." The commenter stated that this definition needs to be expanded to include other forms of processing biosolids that do not add other materials to the biosolids. This definition would then include persons who treat biosolids through methods which are not dependent upon the addition of an augmentation material. An example of a process that does not rely on the addition of a material to meet quality requirements is heat drying and pelletizing of biosolids into fertilizer pellets. In this process, the biosolids are dried either directly or indirectly without the addition of any materials at all.

ANALYSIS: ADEQ agrees with the comment and has made the requested change.

RESPONSE: R18-13-1502(HH) has been amended as follows:

~~HH.~~31. "Person who prepares biosolids" means either the person who generates the biosolids during the treatment of domestic sewage in a treatment works or the person who derives a new product from the biosolids either through processing or by combining it with another material, including blending several biosolids together.

ISSUE: A commenter stated that "watercourse" is more restrictive than "waters of the U.S." and stated that it also indicates that these rules may give rise to inconsistencies with the federal rule with regard to protection of watercourses. The definition of "watercourse" should be clarified to include dry washes, as these often become waterways in a desert state such as Arizona.

ANALYSIS: Watercourses is a definition with many applications. Since the federal "waters of the U.S." governs interstate and intrastate bodies of water, the state rule needed a definition that would protect other bodies of water that do not have an interstate commerce value. ADEQ agrees with the commenters and has broadened the definition to include both of those concepts, as well as others. To accomplish this end, the definition of "watercourse" has been deleted and a new definition, "surface water", has been added. The new definition is not intended to include the floodplain extending beyond the normal bank of the waterway.

RESPONSE: R18-13-1502(CCC) has been deleted. A new subsection, R18-13-1502(44) has been added, as follows:

CCC. "Watercourse" means the channel or normal high water bank of a waterway. The floodplain extending beyond the normal bank of the waterway is not considered to be part of the watercourse.

44. "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, ponds, rivers, streams (including intermittent and ephemeral streams), creeks, washes, draws, mudflats, sandflats, wetlands, sloughs, backwaters, prairie potholes, wet meadows, or playa lakes, 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 or foreign commerce;

d. All impoundments of surface waters;

e. Tributaries of surface waters; and

f. Wetlands.

R18-13-1503. General Requirements

ISSUE: R18-13-1503(A) appears to prohibit application of Exceptional Quality (EQ) biosolids material such as "Milorganite" to a homeowner's lawn. Such material should not be prohibited.

ANALYSIS: ADEQ does not support the concept of EQ biosolids. Please see the discussion at the beginning of this document. However, the site restrictions in R18-13-1507 do not apply to Class A biosolids. Therefore, Class A biosolids may be applied to a homeowner's lawn. ADEQ has modified the rule in response to the comment, by adding a new subsection (B).

RESPONSE: R18-13-1503 is amended as follows:

B. The management practices in R18-13-1507 do not apply when biosolids are sold or given away in a bag or other container for application to the land if the biosolids meet the pollutant concentrations in R18-13-1505 Table 2, the Class A pathogen reduction in R18-13-1506, and 1 of the vector attraction reduction requirements in R18-13-1509, paragraphs (1) through (8).

ISSUE: R18-13-1503(B) purports to require the person who prepares biosolids to provide the applicator with all necessary information. This requirement becomes illusionary when the generator is not subject to Arizona jurisdiction and the applicator is subject only to very limited reporting requirements. An applicator intending to apply out-of-state material should not be permitted to do so unless all appropriate tests are performed in this state and records are maintained here.

ANALYSIS: ADEQ agrees with the commenter and has modified the rule to place the burden of obtaining the information on the applicator.

RESPONSE: R18-13-1503(B) is amended and re-lettered as follows:

~~B.~~C. ~~When different from the applicator, the person who prepares biosolids for land application shall provide the~~ The applicator ~~with all~~ shall obtain the necessary information needed to comply with the requirements of this Article.

ISSUE: One commenter suggested that R18-13-1503(C) be re-written to read: "When different from the applicator, a person who prepares bulk biosolids which do not meet Exceptional Quality criteria shall not give the material to an applicator that has not received written confirmation of the "Request for Registration" pursuant to R18-13-1504 from the Department." Again, the regis-

tration requirements should not apply to EQ biosolids.

ANALYSIS: ADEQ believes that it is important to track the treatment and distribution of all bulk biosolids. To accomplish this end, ADEQ has chosen not to exempt EQ biosolids from the registration process.

RESPONSE: No change to the rule in response to this comment. R18-13-1503(C) is amended and re-lettered as follows for clarity:

~~C.D.When different from the applicator, a person who prepares bulk biosolids shall not give the material to an applicator that has not received~~ The applicator shall not receive bulk biosolids without written confirmation of the filing of a "Request for Registration" pursuant to R18-13-1504 from the Department.

R18-13-1504. Applicator Registration

ISSUE: Applicators of biosolids will be required to register with ADEQ. This is currently being done through the existing plan of operation permitting process. This new requirement will add costs with no new control or protection.

ANALYSIS: This rule has fewer requirements than the previous guidelines used by ADEQ. Registration is the simplest form of notice to ADEQ, because a letter of notice is all that is required. The costs of gathering and preparing information for a letter of notice are less than the efforts and expense currently being incurred.

RESPONSE: No change to the rule.

ISSUE: One commenter stated that the prior ADEQ guidelines, which provided a lengthy and specific list of requirements needed to demonstrate that the applicator had considered sludge quality, hauling and handling, equipment, storage, and the application process were more effective than the proposed rules. In contrast, the proposed rules merely require the applicator to have a name and address and to be able to identify the property. The proposed rule is inadequate regarding the information to be provided to ADEQ.

ANALYSIS: ADEQ disagrees with the comment. The federal Part 503 program is fully self-implementing and ADEQ believes that the registration process is a reasonable compromise which gives ADEQ ample information with which to conduct inspections and investigations.

RESPONSE: No change to the rule.

ISSUE: ADEQ on its own initiative clarified the compliance deadlines contained in R18-13-1504(A) and (B).

ANALYSIS: Dates specified in rule are easier for persons regulated by the rule to comply with, than are the publication dates of rule packages.

RESPONSE: R18-13-1504(A) and (B) have been amended as follows:

A. Any person intending to land-apply bulk biosolids in Arizona shall submit, on a form provided by the Department, a completed "Request for Registration". ~~Applicators currently engaged in land application in Arizona must~~ An applicator shall submit this request ~~no later 90 days after final publication of these rules~~ by June 15, 1996.

B. No applicator shall engage in land application of bulk biosolids ~~beyond 120 days after publication of the final rule until and~~ after July 15, 1996, unless the applicator has obtained a written acknowledgment of the request for registration from the Department.

ISSUE: One commenter requested that R18-13-1504(C)(5)(a) be changed from "owner or leaseholder" to "owner and leaseholder."

ANALYSIS: ADEQ agrees with the comment because the address and telephone number for both the landowner and lessee are needed, especially in the event of multiple lessees.

RESPONSE: R18-13-1504(C)(5)(a) is amended as follows:

a. The name, mailing address, and telephone number of the land owner ~~or leaseholder~~ and lessee, if any;

ISSUE: R18-13-1504(C)(5)(d) requires applicators to list background concentrations of the pollutant parameters listed in Table 4 of R18-13-1505 from representative soil samples. Part 503 does not require this. Why is this required under the proposed rules? What is the definition of "representative sample"? ADEQ is encouraged to consider EQ biosolids when modifying this Section.

ANALYSIS: The background concentrations are required only for sites which have received biosolids prior to the effective date of this rule. This requirement is based on the historical information which should have been developed under the previous ADEQ rules and guidelines. The rule continues the federal policy of tracking metals, although the federal program does not allow representative samples to demonstrate metal loading. "Representative sample" does not need to be defined, since it is governed by the available test methods, such as those found in EPA Document #SW-846 "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods." Sampling allows ADEQ to know the concentrations of metals in the soil attributed to previous applications. This is necessary due to the long history of land application in the state of Arizona. (The discussion of EQ biosolids is found at the beginning of this document.)

RESPONSE: No change to the rule.

ISSUE: R18-13-1504(C)(5)(f) requires publication of a notice of intent to use a virgin site "in the largest newspaper in general circulation in the area." One commenter stated that this will generally mean the Arizona Republic or the Phoenix Gazette. Use of a local publication, published in the county and in general circulation in the area at issue, is more likely to provide actual notice to the concerned public.

ANALYSIS: The Governor's Regulatory Review Council and the Arizona Attorney General's Office have found the language used by the rule to adequately describe a local publication that is read by the population affected by the activity being noticed. Therefore, all publications that meet the description in the rule will be acceptable.

RESPONSE: No change to the rule.

ISSUE: A request was made that R18-13-1504(C)(5)(f) be waived if land application is permitted under a NPDES permit. Secondly, the notification requirement should be made for 5 years instead of 3 years to coincide with NPDES permit renewal.

ANALYSIS: If the NPDES permit has public notice that can serve as a reasonable equivalent in place of this rule requirement, ADEQ does not need a 2nd public notice. However, the NPDES permit often allows notice to be given so far from the location where the land application is being performed, that the notice is ineffective. If notice is done in the area where the land application of biosolids is performed, then the registration may contain proof of the public notice done pursuant to the NPDES permit.

ADEQ declines to change the notice period from 3 years to 5 years because the NPDES permit renewal is based on the continuation of an ongoing process. The notice stating that land application will resume is based on the lack of activity for 3 years.

RESPONSE: No change to the rule.

ISSUE: ADEQ found that portions of R18-13-1504(C)(5)(f), including the effective date, were unclear.

ANALYSIS: The rule has been amended for clarity and grammatical reasons.

RESPONSE: R18-13-1504(C)(5)(f) has been amended as follows:

f. For sites on which biosolids have not been applied as of the ~~date of the proposed rules~~ effective date of this Article, proof ~~that~~ of public notice of the potential use of the site for land application of biosolids ~~has been effected~~ by the placement of a notice in the largest newspaper in general circulation in the area in which the site is located. In order to satisfy this requirement, ~~said~~ the notice ~~must~~ shall appear at least once per week for ~~no less than~~ at least 2 consecutive weeks. In the event a site is not used for land application for a period of 3 consecutive years or more, the site ~~must~~ shall be re-noticed prior to its use.

ISSUE: ADEQ on its own initiative clarified R18-13-1504(E) and (F).

ANALYSIS: The language in the original subsections was not precise.

RESPONSE: R18-13-1504 has been amended as follows for grammatical reasons:

E. The Department shall mail a written acknowledgment of requests for registration, including supplemental requests, within 15 business days of receipt of ~~same~~ the request.

F. ~~Applicators~~ An applicator wishing to use ~~sites which are not~~ a site which has not been identified in ~~their original~~ a request for registration shall file a supplemental request with the Department prior to using the new site.

R18-13-1505. Pollutant Concentrations

ISSUE: ADEQ on its own initiative clarified R18-13-1505 for grammatical reasons.

ANALYSIS: The Section was re-written for parallel construction of sentences, and to change plural subjects to the singular.

RESPONSE: R18-13-1505 has been amended as follows:

A. ~~Biosolids~~ A person shall not apply biosolids with pollutant concentrations which exceed any ~~1 or more~~ of the instantaneous pollutant concentrations set forth in Table 1 of this Section ~~shall not be land applied~~. Biosolids placed on public contact sites with a low potential for child occupancy are exempt from the selenium limit in Table 1.

B. ~~Composted biosolids shall not~~ A person shall not apply composted biosolids that exceed any ~~1 or more~~ of the monthly average pollutant concentrations set out in Table 2 of this Section.

C. ~~No person shall land apply~~ A person shall not apply non-composted bulk biosolids to a site on which the annual pollutant loading rates in Table 3 of this Section will be exceeded. Annual application rates shall be determined using the methodology set out in Appendix A.

D. ~~No person shall land apply~~ A person shall not apply non-composted bulk biosolids to a site where any ~~1 or more~~ of the cumulative pollutant loading rates in Table 4 of this Section will be exceeded. ~~In addition, compliance~~ Compliance with ~~these~~ the cumulative pollutant rates ~~will~~ shall be determined using the following ~~considerations~~:

1. Cumulative pollutant rates shall be calculated using all known biosolids applications to a site since September 13, 1979.

2. ~~Where a site is known to have received biosolids applications prior to the effective date of this rule, applicators must~~ An applicator shall calculate the existing cumulative level of the pollutants set out in Table 4 using either actual analytical data from the application events, or by taking representative soil samples of the site, when it is known that the site received biosolids before April 1996.

3. For those sites which have not received biosolids prior to the effective date of this rule, background soil tests need not be conducted.

4. Biosolids placed on public contact sites with a low potential for child-occupancy are exempt from the selenium limit in Table 4.

ISSUE: A number of commenters suggested that the title to Table 1 of R18-13-1505 be modified. The ceiling concentrations should be re-named "Ceiling Limit Pollutant Concentrations Applicable to All Land-applied Biosolids" or "Ceiling Concentrations."

ANALYSIS: ADEQ agrees with the comment that the change clarifies the meaning of the table, and has made a similar change to the titles of each of the other tables in this Section. The narrative of the rule text will continue to further identify the tables.

RESPONSE: The titles to Tables 1 through 4 of R18-13-1505 have been amended as follows:

Table 1. ~~Instantaneous~~ Ceiling Pollutant Concentrations ~~Applicable to All Land-Applied Biosolids~~

Table 2. Monthly Average Pollutant Concentrations ~~For Composted Biosolids Only~~

Table 3. Annual Pollutant Loading Rates ~~For Non-composted Biosolids~~

Table 4. Cumulative Pollutant Loading Rates ~~For Non-Composted Biosolids~~

ISSUE: One commenter was concerned that the concentrations of pollutants be tested adequately for safety and tested by certified personnel.

ANALYSIS: Pursuant to A.R.S. § 36-495, no person may operate or maintain an environmental laboratory without a license issued by the Arizona Department of Health Services. ADEQ only accepts test results from a lab licensed by the Arizona Department of Health Services. Therefore, ADEQ believes the rule supports this request.

RESPONSE: No change to the rule, however, R18-13-1511(G) has been amended as follows:

G. Biosolids samples shall be analyzed in accordance with the analytical methods set out in 40 CFR 503.8, or A.A.C. R9-14-609 or R9-14-610. Analyses shall be performed at a laboratory operating in compliance with A.R.S. § 36-495 *et seq.*

ISSUE: One commenter was concerned that there were no requirements in the rule to test for polychlorinated biphenyls (PCBs) or hazardous waste.

ANALYSIS: The mixture rule in Arizona hazardous waste rules provides that a hazardous waste remains a hazardous waste when mixed with other wastes. The wastewater treatment facility is responsible for preventing any PCBs or hazardous wastes from entering the plant and ultimately being a component of the sewage sludge. Hazardous wastes are exempt from this rule, but are subject to extensive hazardous waste rules.

RESPONSE: No change to the rule.

ISSUE: One commenter stated that 40 CFR 503 does not exempt sites with low potential for child occupancy from the selenium cumulative limit. The proposed rule is less restrictive than Part 503.

ANALYSIS: In Leather Industries of America Inc. v. EPA, 40 F.3d 392 (D.C. Cir. 1994), the court stated that the EPA did not justify the use of "high-occupancy" exposure assumptions to regulate the selenium content of sludge applied to low-occupancy sites. Therefore, R18-13-1505(A) conforms to the holding of the court case.

RESPONSE: No change to the rule.

ISSUE: One commenter stated that 40 CFR 503 includes chromium in monthly pollutant concentrations and cumulative loading rates. Why is chromium not included in R18-13-1505, Tables 2 and 4?

ANALYSIS: The difference noted in this comment results from the outcome of a court case. In Leather Industries of America Inc. v. EPA, 40 F.3d 392 (D.C. Cir. 1994), the standards for chromium and selenium in Part 503 were found invalid. Therefore, ADEQ did not include chromium and selenium as discussed above.

RESPONSE: No change to the rule.

ISSUE: One commenter expressed a concern about the word "occupancy" used in the public contact site exemption in R18-13-1505(D)(4), because the term is not found in Part 503, and because it does not relate to "public contact sites."

ANALYSIS: The term "occupancy" comes from case law (Leather Industries of America Inc. v. EPA, 40 F.3d 392 (D.C. Cir. 1994) and has been used by ADEQ to track the judicial terminology.

RESPONSE: No change to the rule.

ISSUE: A comment was received asking why molybdenum was not included in Tables 2, 3, or 4 of R18-13-1505. Another com-

ment stated that molybdenum's stable form is anionic, which is more soluble in alkaline conditions, and would be able to move more quickly through Arizona soils. While molybdenum is normally low in Arizona sludges, the opposite may be true for out-of-state sludges that come from more industrialized areas.

ANALYSIS: Molybdenum (Mo) is not currently included in the equivalent tables found in 40 CFR 503. The U.S. EPA has been unable to justify its regulation on a nationwide level; however, ADEQ will continue to study this pollutant for its effect within the state and welcomes information on this point.

RESPONSE: No change to the rule.

ISSUE: One commenter stated that, although R18-13-1505 purports to limit instantaneous concentrations of certain pollutants, and cumulative loading, it does not actually require anyone to perform tests to verify that this has been done. The proposed rule does not have a counterpart to 40 CFR 503.7 requiring someone to ensure that these requirements are met. Out-of-state sludge is the responsibility of the applicator.

RESPONSE: The monitoring Section, R18-13-1511, requires testing for the pollutants found in R18-13-1505 Tables 1, 2, and 3, and conforms to 40 CFR 503.7. To ensure the public has access to this information, the reports are available at ADEQ and are updated annually, at a minimum. The applicator is the only party over which ADEQ has jurisdiction when sewage sludge from out-of-state is land-applied in Arizona; therefore, ADEQ can only regulate the applicator's actions. R18-13-1512 has been amended to reflect this concern and to require the applicator to retain the information on the part of an out-of-state preparer.

RESPONSE: No change to R18-13-1505. However, R18-13-1512(B) is amended by adding a new subsection 12:

12. Information in paragraphs (1) through (6) of subsection (A) of this Section, when the person who prepares the biosolids is not located in this state.

ISSUE: One commenter requested that a list of additional pollutants, such as teratogens, carcinogens, radioactive material, and other pollutants that can cause biological or genetic problems for the human population, should be tested for periodically, to confirm the quality of the biosolids. Other commenters were opposed to the monitoring of parameters in addition to those set out in R18-13-1505.

ANALYSIS: ADEQ cannot justify the cost of testing for all possible pollutants. The Aquifer Protection Permit rules require that wastewater treatment facilities provide assurance through testing for a broad spectrum of materials in the sewage sludge.

RESPONSE: No change to the rule.

ISSUE: Several commenters requested that Arizona follow 40 CFR 503. One stated that any state sludge program that imposes more stringent requirements for biosolids would be grossly unreasonable in light of the over-protectiveness of Part 503. Other commenters requested additional protection and stated that the proposed rules were not stringent enough.

ANALYSIS: Arizona is more restrictive because with long-term uses it is possible for EPA's standards to be exceeded and the environment degraded. Cumulative loading rates can exceed allowable pollutant levels with many biosolids when over-applied. Additionally, ADEQ had to retain the cumulative metal loading requirement from R18-9-128 in order to ensure equivalent aquifer protection as found in the APP program.

RESPONSE: No change to the rule.

ISSUE: One commenter requested that the loading rates found in R18-13-1505 be compared to the proposed Interim Soil Remediation rules, Arizona Residential Health Based Guidance Levels which do not require a notice on the deed or any other institutional controls, to ensure the allowable levels in the biosolids rule do not exceed the proposed Interim Soil Remediation rules.

ANALYSIS: ADEQ compared the loading rates in the biosolids rule with the limits set in the proposed Interim Soil Remediation rules. The metal limits contained in the biosolids rule currently meet the Arizona Residential Health Based Guidance Levels, with the exception of arsenic. The proposed Interim Soil Remediation rules will be replaced in 1996 with permanent Soil Remediation rules. Again, application of biosolids under this rule is a legal application and therefore not subject to the proposed Interim Soil Remediation rules.

RESPONSE: No change to the rule.

ISSUE: One commenter stated that the requirement in R18-13-1505(D)(1) to track cumulative pollutant loading from 1979 should not be applicable to Exceptional Quality biosolids, so that the state rule would match Part 503. Moreover, the date for tracking, "September 13, 1979," is not practical since the approved method of sampling and analysis for Part 503 were not in use prior to February 1993. The date should be changed to February 1993.

ANALYSIS: The request to exempt EQ biosolids from tracking is not supported by ADEQ. Therefore, tracking is applicable to all bulk biosolids except for composted biosolids. The date placed in rule is reasonable because the ADEQ Waste Programs Division has required tracking since 1979, through statutorily-authorized guidelines. Therefore, the date remains at 1979.

RESPONSE: No change to the rule.

ISSUE: A comment stated that none of the sludges were appropriate for application on land on which food or feed crops were grown. The commenter said that root crops like carrots, when planted in contaminated soils, remove the contaminants from the soil, after which the crop is incinerated. So root crops, in particular, seem to absorb pollutants found in sludges.

ANALYSIS: The EPA Risk Assessment, which is discussed earlier, evaluated 14 pathways of exposure. The numerical limits in R18-13-1505 are based on the most restrictive interpretations of this assessment. Additionally, all cumulative levels are below those found in the Arizona Health Based Guidance Levels found in the proposed Interim Soil Remediation rules. ADEQ believes the adopted rule is sufficiently protective of public health. Also, R18-13-1508(A)(2) requires a 20-month waiting period prior to harvesting root crops.

RESPONSE: No change to the rule.

R18-13-1506. Pathogen Controls

ISSUE: One commenter requested that R18-13-1506(A) include the following language: "at the time of use."

ANALYSIS: ADEQ agrees and has made the requested change because it clarifies the rule.

RESPONSE: R18-13-1506(A) has been amended as follows, to comply with the comment and for grammatical reasons:

A. All biosolids applied to land ~~must~~ shall meet either Class A or Class B pathogen ~~requirements~~ reduction as described in this Section at the time the biosolids are used or disposed.

ISSUE: One commenter requested an explanation of ADEQ's addition of the "consecutive" day requirement in R18-13-1506(E)(6) for composting, when such a requirement is not expressly stated in Part 503. The commenter wondered if this made the biosolids rule more restrictive than Part 503.

ANALYSIS: The "consecutive" days refers to the number of days that the compost is heated to 40°C. Part 503 implies that 5 consecutive days is the timeframe required to achieve the pathogen reduction for biosolids with Class B pathogen reduction. ADEQ believes the biosolids rule and Part 503 are equivalent.

RESPONSE: No change to the rule.

ISSUE: One commenter requested that ADEQ include an alternative method to allow for new technology. This method is an alternative to allow for a process that is equivalent to a Process to Further Reduce Pathogens as determined by the permitting authority. The EPA calls this the Pathogen Equivalency Committee (PEC). EPA makes its determinations of equivalency based on the PEC's recommendation. ADEQ could also rely on the PEC's findings.

ANALYSIS: ADEQ agrees that the biosolids rule should include PEC's recommendations. ADEQ added this option as Alternative 11 for Class A, and Alternative 7 for Class B.

RESPONSE: R18-13-1506(D) and (E) are amended as follows:

(D)(11)Alternative 11 -- Other processes determined by the EPA Pathogen Equivalency Committee to meet Processes to Further Reduce Pathogens may be authorized by the Director.

(E)(7Alternative 7 -- Other processes determined by the EPA Pathogen Equivalency Committee to meet Processes to Significantly Reduce Pathogens may be authorized by the Director.

ISSUE: In R18-13-1506(D) the words "is used" should be added to the end of the 1st subsection before the list of alternatives, so that the sentence is complete.

ANALYSIS: ADEQ agrees with the comment and has made the requested change. In addition, ADEQ has clarified similar introductory language so that the reader knows whether 1 or all of the items that follow are required.

RESPONSE: Portions of R18-13-1506(D) and (E) have been amended as follows:

D. ~~A biosolid satisfies~~ Biosolids satisfy the Class A pathogen ~~requirements~~ reduction when the density of either fecal coliform is less than 1000 Most Probable Number per gram of total solids (dry-weight basis), or the density of *Salmonella sp.* bacteria is less than 3 Most Probable Number per 4 grams of total solids (dry-weight basis); and any 1 of the following ~~10~~ 11 alternative pathogen treatment options ~~, set forth below~~ is used:

2. Alternative 2 -- The pathogen treatment process meets all the following parameters:

3. Alternative 3 -- The results of the pathogen treatment ~~are as follows~~ meet all of the following:

4. Alternative 4 -- Composting shall use either of the following:

5. Alternative 5 -- Heat drying. The biosolids are dried by contact with hot gases to reduce the moisture content to 10% or lower. During the process, either 1 of the following shall be met:

E. ~~A biosolid satisfies~~ Biosolids satisfy the Class B pathogen ~~requirements~~ reduction when it meets any 1 of the ~~6~~ following 7 options ~~set out below~~:

ISSUE: ADEQ on its own initiative clarified alternative 6 in R18-13-1506(E) because the alternative is only a method of pathogen reduction, and not a definition of compost.

ANALYSIS: The amended language ensures that Class B biosolids, including those which have pathogen reduction by composting, meet the site restrictions contained in the rule.

RESPONSE: R18-13-1506(E)(6) has been amended as follows:

6. Alternative 6 -- Composting. Using either the within-vessel, static-aerated-pile or windrow composting methods, the temperature of the biosolids is raised to 40°C or higher for 5 consecutive days. For at least 4 hours during the 5 days, the temperature in the compost pile shall exceed 55°C. This alternative does not meet the definition of composted found in R18-13-1502.

R18-13-1507. Management Practices

ISSUE: The rule has several opportunities for ADEQ to authorize exceptions to the general requirements. No procedure is described for granting such an exception. As these standards provide the minimum community protection afforded under this rule, some notice and opportunity to be heard should be provided to the potentially impacted community before an exception is granted.

ANALYSIS: The applicability Section (R18-13-1501) did not clarify how variances to the land application of biosolids might be regulated by ADEQ. Therefore, specific citations as to which programs regulate any variation from the rule have been added, in the form of new subsections. The new subsections have been added to identify that application in accordance with this Article is exempt from the APP program. When the requirements of R18-13-1507, Management Practices, cannot be met, an individual aquifer protection permit may have to be issued for land application. However, all other Sections of this Article are always applicable. Therefore, R18-13-1507(A), paragraphs (1) through (8) have been amended to conform. The phrase "unless otherwise authorized by the Department" was no longer needed; the applicability Section directs the reader to follow these rules or the APP rules. Other changes to this Section are described later in this document.

RESPONSE: R18-13-1507(A), paragraphs (1) through (8) have been amended as follows:

1. Biosolids shall not be applied to soil with a pH of less than 6.5 at the time of the sludge application~~, unless otherwise authorized by the Department~~.
2. Biosolids shall not be applied to land with slopes greater than 6%~~, unless otherwise authorized by the Department~~.
3. ~~Except in compliance with a permit issued under the Aquifer Protection Program (see A.R.S. § 49-241 and A.A.C. R18-9-101),~~ Biosolids shall not be applied to land under the following conditions:
   a. ~~Class A~~ Biosolids with Class A pathogen reduction shall not be applied to land where the depth to groundwater is 5 feet (1.52 meters) or less.
   b. ~~Class B~~ Biosolids with Class B pathogen reduction shall not be applied to land where the depth to groundwater is 10 feet (3.04 meters) or less.
   c. ~~Class B~~ Biosolids with Class B pathogen reduction shall not be applied to gravel, coarse or medium sands, and sands with >15% ~~course~~ coarse fragments ~~shall not be applied~~ where the depth to groundwater is 40 feet (12.2 meters) or less.
4. Biosolids shall not be applied to land that is 32.8 feet (10 meters) or less from ~~watercourses~~ surface water~~, unless otherwise authorized by the Department.~~
5. Biosolids shall not be stored or applied closer than 1000 feet (305 meters) from a public or semi-public drinking water supply well, and no closer than 250 feet (76.2 meters) from any other water well~~, unless otherwise authorized by the Department~~.
6. Biosolids shall not be stored or applied within 25 feet (7.62 meters) of a public right-of-way or private property line unless the applicator receives permission to apply biosolids from the owner or ~~leaseholder~~ lessee of the adjoining property.
7. ~~Except in the case of reclamation, biosolids~~ Biosolids shall not be applied at an application rate that is ~~equal to or~~ greater than the agronomic rate of the vegetation present or crop grown on the site. ~~[see Appendix B]~~

ISSUE: R18-13-1507(A)(3)(a),(b), and (c) use the wrong terminology. "Class A Biosolids" should be changed to "biosolids with Class A Pathogen reduction" and "Class B Biosolids" should be replaced with "biosolids with Class B Pathogen reduction." The suggested terminology is more descriptive and more accurate.

ANALYSIS: ADEQ agrees and has made the requested change.

RESPONSE: R18-13-1507 has been amended as shown above. In addition, the change has been made throughout the rule.

ISSUE: ADEQ should explain why R18-13-1507(A)(1) is more restrictive than Part 503. Part 503 does not have a restriction on the pH of the soil. Lime stabilized and lime pasteurized biosolids are particularly useful in reclamation of acidic soils and wastes.

ANALYSIS: 6.5 pH is an additional requirement by ADEQ that is not expressly found in Part 503. The modeling used for Part 503 assumed a pH of 6.5. ADEQ included this requirement because acidic soils are found in Arizona. Metals are more mobile in acidic soil and have a potential for greater impact to the groundwater. This requirement is also found in R18-9-128, which is being repealed and re-written in this rulemaking.

RESPONSE: No change to the rule.

ISSUE: R18-13-1507(A)(3) states: "Except in compliance with a permit issued under the APP biosolids shall not be applied to land under the following conditions:

a. Class A Biosolids shall not be applied to land where the depth to groundwater is 5 feet (1.52 meters) or less.

b. Class B Biosolids shall not be applied to land where the depth to groundwater is 10 feet (3.04 meters) or less.

c. Class B Biosolids applied to gravel, coarse or medium sands, and sands with >15% course fragments shall not be applied where the depth to groundwater is 40 feet (12.2 meters) or less."

The commenter suggested: Add to this Section percolation tests to verify what the percolation rates are in the soil, and add further limitations to the rule for situation in which the rate is rapid. A depth to groundwater of 5' is inadequate.

The inherent variability in soil morphology will influence the effect that sludge has on the environment. Sludge application regulations should not be too restrictive, thereby limiting economics. They should allow site specific conditions to influence depth-to-water limitations.

ANALYSIS: ADEQ used soil types and assumed percolation rates to develop the depth-to-groundwater restrictions. ADEQ believes this description is universal enough to provide protection but also flexible enough to cover different soil types.

RESPONSE: No change to the rule.

ISSUE: One commenter suggested that the depth-to-groundwater restrictions be set at 1 meter or less for Class B biosolids. The model used by EPA assumed that the biosolids were incorporated to a depth of 15 cm and the depth-to-groundwater was assumed to be 1 meter, which is a reasonable worst-case assumption. The model also assumed that a drinking water well was also located within the area where the biosolids had been applied with no setbacks from the well. Because biosolids are applied only at agronomic rates, this prevents the movement of nitrogen into the ground water. The organic bonding capacity of the biosolids prevents the migration of metals from the biosolids into the groundwater resources. However, other commenters said that reducing the depth-to-groundwater requirement from APP's 40' greatly reduces the protection to groundwater.

ANALYSIS: The Arizona Aquifer Protection Permit (APP) program previously used 40 feet and ADEQ believes the 5 feet for Class A land application or 10 feet for Class B application is a justifiable buffer for the APP class exemption. ADEQ is unable to reduce the depth at this time.

R18-13-1503 has been amended to add a new subsection (B), stating that "The management practices in R18-13-1507 do not apply when biosolids are sold or given away in a bag or other container for application to the land if the biosolids meet the pollutant concentrations in R18-13-1505 Table 2, the Class A pathogen reduction in R18-13-1506, and the vector attraction reduction requirements in R18-13-1509, paragraphs (1) through (8)." This means that bagged biosolids have no depth-to-groundwater requirement.

RESPONSE: No change to the rule.

ISSUE: Biosolids should be allowed to be land-applied at the agronomic rate of the vegetation present or crop grown on site. The words "equal to or" should be deleted from R18-13-1507(A)(7) to be consistent with Part 503.

ANALYSIS: ADEQ found no reason to limit nitrogen to levels below the agronomic rate. ADEQ agrees with the comment and has made the requested change.

RESPONSE: R18-13-1507(A)(7) is amended as follows:

7. ~~Except in the case of reclamation, biosolids~~ Biosolids shall not be applied at an application rate that is ~~equal to or~~ greater than the agronomic rate of the vegetation present or crop grown on the site. ~~[see Appendix B]~~

ISSUE: R18-13-1507(A)(8) prohibits application of biosolids in a manner that "could adversely affect a threatened or endangered species or critical habitat as defined under the Endangered Species Act" which is more restrictive than the language found in Part 503.

ANALYSIS: ADEQ does not have authority to enforce the Endangered Species Act, and therefore this Section has been deleted.

RESPONSE: R18-13-1507(A)(8) has been deleted, and the paragraphs have been renumbered.

ISSUE: The hydraulic loading rate formula in R18-13-1507(A)(9) is unclear.

ANALYSIS: ADEQ has re-written the formula as a narrative.

RESPONSE: R18-13-1507(A)(9) is amended and re-numbered as follows:

~~9.~~ 8. ~~Biosolids, including domestic septage, shall not be applied at a hydraulic loading rate which exceeds the~~

The RATE = Crop or vegetation nitrogen needs

(in gallons 0.0026

per acre per year)

Biosolids, including domestic septage, shall not be applied at a rate which exceeds the hydraulic loading rate. The hydraulic loading rate, in gallons per acre per 365-day period, is calculated by dividing the amount of nitrogen needed by the crop or vegetation grown on the land, in pounds per acre per 365-day period, by 0.0026. The hydraulic loading rate shall not exceed 27,000 gallons per acre per application.

ISSUE: R18-13-1507 does not address the effects of timing applications of biosolids or the importance of the forms of nitrogen

present in biosolids. For biosolids low in water and mineral nitrogen content (NH_4 or $N0_3$) the time of application is of less concern. However, for liquid slurries that contain appreciable amounts of ammonium or nitrate, timing of application could have a significant effect upon subsequent loss of nitrogen due to deep percolation following irrigation.

ANALYSIS: The timing of application of biosolids is not regulated under this rule, however the timing is addressed under R18-9-202, describing agricultural best management practices for the application of nitrogen fertilizers.

RESPONSE: No change to the rule.

ISSUE: R18-13-1507(A)(10) states "Biosolids shall not be applied to land that is flooded, frozen, or snow-covered, except as authorized by a permit issued pursuant to Section 1342 or 1344 of the CWA or an equivalent state permit."

ADEQ is more restrictive than the federal regulation which provides: "Bulk sewage sludge shall not be applied to agricultural land, forest, a public contact site, or a reclamation site that is flooded, frozen or snow covered so that the bulk sewage sludge enters a wetland or other waters of the United States, as defined in 40 CFR 122.2, except as provided in a permit issued pursuant to §402 or 404 of the Clean Water Act."

ANALYSIS: Arizona's climate and precipitation were considered when re-wording this Section. To prevent surface and groundwater contamination, bulk sludge cannot be placed on flooded land. ADEQ believes that the term "waters of the United States" is too narrow to be protective, since it concerns interstate waters and intrastate waters; and the term "waters of the state" would include any flooded area. Since much of Arizona does not have a problem with snow pack or floods for long periods of time, it seems reasonable that if an applicator wants to place sludge on flooded, frozen, or snow-covered land a permit would be issued to ensure that contamination does not occur.

RESPONSE: R18-13-1507(A)(10) is changed and re-numbered as follows:

~~10.~~ 9.Bulk biosolids shall not be applied to land that is flooded, frozen, or snow-covered, ~~except as authorized by a permit issued pursuant to Section 1342 or 1344 of the CWA,~~ so that the bulk biosolids enter a wetland or other surface water, except as provided in a permit issued pursuant to Section 402 or 404 of the CWA or an equivalent state permit.

ISSUE: One commenter stated that R18-13-1507 did not appear to examine nitrogen as a potential pollutant. Nitrate-N is a potential groundwater pollutant in desert soils when applied at rates that exceed plant requirements.

ANALYSIS: ADEQ agrees that nitrogen may be a pollutant when applied in excess of the agronomic rate. R18-13-1507(A)(7) prohibits land application of biosolids at a rate greater than the agronomic need of the crop. Additionally, R18-13-1507(A)(10) requires that a crop must be grown on the site before biosolids may be re-applied.

RESPONSE: R18-13-1507(A)(11) has been amended and renumbered as follows:

~~11.~~ 10.Once a site has received biosolids containing nitrogen at the equivalent of the agronomic rate appropriate for that site, a crop must be grown on the site prior to any additional biosolids application.

ISSUE: One commenter agreed with the recommendation found in R18-13-1507(B) which requires labelling of bagged biosolids; however, the commenter recommended that only those persons bagging products that are considered a fertilizer should have to show the nutrient content on the bag.

ANALYSIS: Only the Department of Agriculture requires that the labelling of the nutrient contents be shown. R18-13-1507(B) requires labelling of appropriate application rates to prevent contamination of groundwater by over applying biosolids.

RESPONSE: R18-13-1507(B) has been amended as follows for clarity:

B. When ~~composted or non-composted~~ biosolids are to be ~~bagged~~ placed in a bag or ~~placed in a similar~~ other container, the ~~preparer~~ person who prepares the biosolids shall distribute ~~the~~ a label or information sheet to persons receiving the material. This label or information sheet shall contain at least the following information:

1. The identity of the person who prepared the biosolids;
2. Instructions on the proper use of the material, including agronomic rates, and an annual application rate which ensures that the annual pollutant rates set out in R18-13-1505 will not be exceeded; and
3. A statement that ~~violation of these instructions constitutes a violation of this Article~~ application of the biosolids to the land is prohibited to exceed application rates described in the instructions on the label or information sheet.

ISSUE: One commenter expressed concern that out-of-state distributors of bagged biosolids would incur additional costs from the proposed rule's labelling instructions. R18-13-1507(B), as proposed, would require additional information unique to Arizona.

ANALYSIS: ADEQ agrees with the commenter and has clarified the rule to conform to Part 503, and to not require information unique to the state.

RESPONSE: R18-13-1507(B) has been amended as noted above.

R18-13-1508. Site Restrictions

ISSUE: R18-13-1508(A)(1) and (2) which provide restrictions on harvesting crops after land application of biosolids is worded differently from Part 503. One commenter suggested that the rule be re-worded to specifically match Part 503.

ANALYSIS: R18-13-1508(A)(1) requires 14 months as the timeframe prior to harvesting crops that may touch biosolids and grow above the ground, as does Part 503. R18-13-1508(A)(2) requires 20 months as the waiting time after application of biosolids and harvesting of food crops that grow in or below the land's surface, as in Part 503. ADEQ believes the language in these Sections is equivalent to Part 503, and has been reworded only for clarity.

RESPONSE: No change to the rule in response to the comment. R18-13-1508(A)(1) has been amended for grammatical reasons as follows:

1. Food crops with harvested parts that touch the ~~biosolids/soil~~ biosolids, or biosolids and soil mixture, but otherwise grow above the land's surface shall not be harvested for 14 months following application~~;~~.

ISSUE: Part 503 requires a 30-day harvesting restriction for food, feed, and fiber crops. R18-13-1508(A)(4) only includes feed and fiber crops. A comment was received asking that food crops be included in this Section.

ANALYSIS: ADEQ agrees with the commenter. The omission of "food" was an error. It has been corrected in the rule.

RESPONSE: R18-13-1508(A)(4)is changed as follows:

4. Food, feed, and fiber crops shall not be harvested for 30 days after application.

ISSUE: One commenter suggested that R18-13-1508(C) be changed to read: "Land owners OR leaseholders shall provided applicators with a signature indicating receipt of the site restrictions statement." Another commenter requested that the words "land owners and leaseholders" be retained throughout the rule, so that both the land owner and the lessee would be aware of the biosolids application.

ANALYSIS: ADEQ agrees that the word "and" should be changed to "or" so that there is flexibility for farming operations. A land owner that wishes to prohibit a lessee from applying biosolids may address that issue in the agreement between the parties.

RESPONSE: R18-13-1508(C) has been amended as follows, to conform to the comment and for grammatical reasons:

C. ~~Land owners and leaseholders~~ The land owner or lessee shall provide ~~applicators~~ each applicator with a signature indicating receipt of the site restriction statement.

R18-13-1509. Vector Attraction Reduction

ISSUE: One commenter requested a change in the subsection numbering of R18-13-1509, so that the vector attraction reduction methods were numbered rather than lettered.

ANALYSIS: The subsection numbering appeared to omit headings and lacked clarity. ADEQ agrees with the comment and has corrected the rule.

RESPONSE: R18-13-1509 has been re-formatted in response to the comment, and has been clarified.

A. ~~One~~ Except as provided in subsection (B), an applicator or generator shall use 1 of the following vector attraction reduction procedures ~~shall be met~~ when biosolids are land-applied~~:~~:

Biosolids that are sold or given away in a bag or similar container, or are applied to a lawn or home garden, shall meet 1 of the vector attraction reduction alternatives set out in subsection (A).

1. Pre-Land Application Alternatives

~~a.~~1. Reducing the mass of volatile solids by a minimum of 38% using the ~~methodology~~ calculation procedures set out in "Environmental Regulations and Technology -- Control of Pathogens and Vector Attraction in Sewage Sludge", (EPA-625/R-92/013, 1992, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268) ~~incorporated herein by reference, and no future editions, and on file with the Department and the Secretary of state;~~.

~~b.~~2. For an anaerobically digested biosolid, by anaerobically re-digesting a portion of the previously digested material in a laboratory bench-scale unit for 40 additional days at a temperature between 30 and 37°C. Vector attraction reduction is achieved where the volatile solids in the material at the beginning of the period are further reduced by less than 17%.

~~c.~~3. For an aerobically digested biosolids, by aerobically re-digesting a portion of the previously digested material (which has a percent solids of 2% or less), in a laboratory bench-scale unit for an additional 30 days at 20°C. Vector attraction reduction is achieved where the volatile solids in the material at the beginning of the period are further reduced by less than 15%~~;~~.

~~d.~~4. Subjecting the biosolids to an aerobic process during which the specific oxygen uptake rate (SOUR) is equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry-weight basis) at a temperature of 20°C~~;~~.

~~e.~~5. Subjecting the biosolids to an aerobic process for 14 days or longer, during which, the ~~low~~ temperature of the biosolids shall be higher than 40°C and the average temperature of the biosolids shall be higher than 45°C~~;~~.

~~f.~~6. Raising the pH of the biosolids to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 2 hours and then at 11.5 or higher for an additional 22 hours~~;~~.

~~g.~~7. The percent solids ~~containing~~ of the biosolids that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75% based on the moisture content and total solids prior to mixing

with other materials~~; or~~.

~~h.~~8. The percent solids of the biosolids containing unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90% based on the moisture content and total solids prior to mixing with other materials.

2. Post Land Application Alternatives

~~a.~~9. ~~i.~~Injecting the biosolids below the surface of the land such that no significant amount of biosolids is present on the land surface 1 hour after injection. When the biosolids meet Class A pathogen reduction, ~~ii. For purposes of meeting the Class A pathogen requirements,~~ injection shall occur within 8 hours after being discharged from a Class A pathogen treatment process.

~~b.~~10. ~~i.~~Incorporating the biosolids into the soil within 6 hours after application. When the biosolids meet Class A pathogen reduction, application ~~ii. For purposes of meeting the Class A pathogen requirements, incorporation~~ shall occur within 8 hours after being discharged from a Class A pathogen treatment process.

B.Biosolids that are sold or given away in a bag or other container, or are applied to a lawn or home garden, shall meet 1 of the vector attraction reduction alternatives set out in paragraphs (1) through (8) of subsection (A).

C. ~~3.~~For domestic septage, vector attraction reduction shall be met by 1 of the following 3 methods:

~~a.~~1.By injecting in accordance with subsection 9 of subsection ~~(B)(1) above~~ (A);

~~b.~~2.By incorporating in accordance with subsection 10 of subsection ~~(B)(2) above~~ (A); or

~~c.~~3.By raising the pH of the biosolids to 12 or higher through the addition of alkali and, without the addition of more alkali, holding the pH at 12 or higher for at least 30 minutes.

ISSUE: R18-13-1509(1)(d) appears to require that the specific oxygen uptake rate (SOUR) test be a continuous operating parameter. One commenter said that the process should be carried out after the test. The commenter requested that the subsection be written consistent with the language in 40 CFR 503.33(b)(4).

ANALYSIS: ADEQ agrees with the comment and has amended the rule that contains the monitoring requirements, R18-13-1511(H), to clarify that the SOUR test does not need to be continuously operated. ADEQ believes that R18-13-1509(1)(d) is equivalent to the Part 503 regulation in 40 CFR 503.33.

RESPONSE: No change to R18-13-1509 in response to the comment. R18-13-1511(H) is amended as follows:

H. Monitoring that can be performed in a continuous manner for pathogen and vector attraction reduction treatment operating parameters, such as time and temperature, shall be monitored on a continuous basis during treatment.

ISSUE: One commenter stated that R18-13-1509(1)(g) contradicts what is written in 40 CFR 503.33(b)(7). To be consistent with that federal regulation, "containing" should be replaced with "of biosolids that does not contain." The commenter suggested that the rule include the federal subsection except for substituting the "sewage sludge" with "biosolids."

ANALYSIS: R18-13-1509(1)(g) currently states: "g. The percent solids containing unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75% based on the moisture content and total solids prior to mixing with other materials; or."

The equivalent vector attraction reduction process in 40 CFR 503.33 states: "(7) The percent solids of sewage sludge that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75% based on the moisture content and total solids prior to mixing with other materials. "

ADEQ agrees with the comment and has made the requested change.

RESPONSE: R18-13-1509(1)(g) is amended as follows:

~~g.~~7. The percent solids ~~containing~~ of the biosolids that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75% based on the moisture content and total solids prior to mixing with other materials~~; or~~.

ISSUE: In R18-13-1509(1)(h) a commenter requested the language be made consistent with 40 CFR 503.33(b)(8), by inserting "of biosolids" after "percent solids."

ANALYSIS: R18-13-1509(1)(h) currently states: "h. The percent solids containing unstabilized solids shall be equal to or greater than 90% based on the moisture content and total solids prior to mixing with other materials." ADEQ agrees with the clarification requested by the commenter.

RESPONSE: R18-13-1509(1)(h) is changed as follows:

~~h.~~8. The percent solids of the biosolids containing unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90% based on the moisture content and total solids prior to mixing with other materials.

ISSUE: One commenter stated that R18-13-1509(2)(a)(ii) and (2)(b)(ii) do not appear to be for the purpose of meeting class A pathogen requirements as written in the proposed rules, as compared to 40 CFR 503.33(b)(9)(iii) and 503.33(b)(10)(ii). The commenter indicated that these requirements are the management practices required to be followed if the biosolids already have the

Class A pathogen reduction treatment. The commenter requested the inclusion of 40 CFR 503.33(b)(9)(iii) and 503.33(b)(10)(ii) except for substituting "sewage sludge" with "biosolids."

ANALYSIS: ADEQ reviewed the equivalent regulation in Part 503 and found this comment to be accurate. ADEQ has modified the rule to reflect the comment.

RESPONSE: R18-13-1509(2) is amended and re-formatted as follows:

2. Post Land Application Alternatives

~~a.~~9. ~~i.~~Injecting the biosolids below the surface of the land such that no significant amount of biosolids is present on the land surface 1 hour after injection. When the biosolids meet Class A pathogen reduction, ~~ii. For purposes of meeting the Class A pathogen requirements,~~ injection shall occur within 8 hours after being discharged from a Class A pathogen treatment process.

~~b.~~10. ~~i.~~Incorporating the biosolids into the soil within 6 hours after application. When the biosolids meet Class A pathogen reduction, application ~~ii. For purposes of meeting the Class A pathogen requirements, incorporation~~ shall occur within 8 hours after being discharged from a Class A pathogen treatment process.

R18-13-1510.Transportation

ISSUE: One commenter requested ADEQ remove the requirement for a vehicle which transports biosolids to be fly-tight, and only require the vehicle to be covered. The commenter stated that the requirement was impractical.

ANALYSIS: Biosolids may be in a liquid or a dry form. Therefore, R18-13-1510 has been modified to require only prevention of blowing of materials and that vehicles be leakproof. The rule also indicates that transportation vehicles must comply with other ADEQ solid waste rules.

RESPONSE: R18-13-1510(A)is changed as follows:

A. ~~Vehicles~~ Trucks, trailers, rail-cars, or other vehicles used to transport bulk biosolids into and within Arizona shall ~~satisfy R18-8-612 by having a trailer or tank which is~~ be covered to prevent blowing of materials and be leakproof ~~and fly-tight~~ and comply with the requirements found in R18-8-510 or R18-8-612.

ISSUE: One commenter requested R18-13-1510(B) to include rail-cars as vehicles that transport biosolids.

ANALYSIS: To ensure the rule is clear and includes all possible vehicles that might transport biosolids, ADEQ agrees and has amended the rule to reflect the comment.

RESPONSE: R18-13-1510(B) is amended as follows:

B. ~~Vehicle trailers and tanks~~ Trucks, trailers, rail-cars, or other vehicles used to transport biosolids shall be periodically cleaned to prevent odors or insect breeding. Tank vehicles used to transport commercial or industrial septage, or restaurant grease-trap wastes, which are also to be used to haul domestic septage, shall be cleaned before loading the domestic septage to ensure ~~the~~ that mixing of wastes does not occur.

ISSUE: One commenter suggested that if biosolids spill on the soil, it may be more practical to incorporate it into the soil rather than require that the biosolids be picked up.

ANALYSIS: ADEQ agrees with the commenter that incorporation of biosolids may be more prudent than excavation. Remediation is required when biosolids are spilled at sites not intended to receive biosolids. There are so many possible conditions where a spill might occur, that requiring excavation is an unreasonable burden for the transporter, therefore, R18-13-1510(C) has been amended to allow for other actions on a case-by-case basis.

RESPONSE: R18-13-1510(C) is amended as follows:

C. In the event bulk biosolids are spilled while being transported, the transporter shall undertake the following activities:

1. Spillage, including any visibly discolored soil, shall be picked up immediately by the transporter, unless otherwise determined by the Department on a case-by-case basis.

2. Within 24 hours of the spill, the transporter shall notify the Department of the spill, and shall submit written notification within 7 days. This written notification shall include the location of the spill, the reason it occurred, the amount of biosolids spilled, and the steps taken to clean up the spill.

ISSUE: One commenter requested that R18-13-1510 apply to interstate transportation. The commenter stated that the applicator should demonstrate the following security measures for loading and transporting biosolids:

a) Sludge should be placed in containers dedicated solely to sludge transport, free of residue from previous shipments.

b) Each container should be sealed using individually numbered seal pins.

c) Each container should be individually manifested. The source container number, seal numbers and weight shall be checked and verified on the manifest at time of shipment.

d) Upon arrival at an off-loading site, an independent inspector shall check the seals to ensure that the containers have not been opened. The manifest information shall be confirmed. If any seal or container does not pass the inspection, the container will be segregated for resampling and analysis of pollutants.

ANALYSIS: The requirements requested appear to be more appropriate for a hazardous waste or special waste. Biosolids are not a hazardous or special waste. Therefore, ADEQ believes that testing the biosolids and passing the test result to the next biosolids handler is more important than sealing the tanks as recommended by this comment. And, again, ADEQ has no statutory authority to govern interstate transportation.

RESPONSE: No change to the rule.

R18-13-1511. Self-monitoring

ISSUE: One commenter was concerned that the concentrations of pollutants be tested adequately for safety and tested by certified personnel.

ANALYSIS: Pursuant to A.R.S. § 36-495, no person may operate or maintain an environmental laboratory without a license issued by the Arizona Department of Health Services. ADEQ only accepts test results from a lab licensed by the Arizona Department of Health Services. Therefore, ADEQ believes the rule supports this request.

RESPONSE: R18-13-1511(G) has been amended as follows:

G. Biosolids samples shall be analyzed in accordance with the analytical methods set out in 40 CFR 503.8, or A.A.C. R9-14-609 or R9-14-610. Analyses shall be performed at a laboratory operating in compliance with A.R.S. § 36-495 *et seq.*

ISSUE: One commenter recommended that this Section should further define "continuous basis" with respect to windrow composting. The commenter stated that R18-13-1511 was unclear as to whether the person who prepares the biosolids should check the temperature of the biosolids once a day or whether a thermometer must continually monitor the temperature of the biosolids.

ANALYSIS: ADEQ does not intend to mandate that these parameters must be monitored perpetually. However, when intermittent monitoring is necessary, readings or monitoring should be conducted as continuously as practical. R18-13-1511(H) has been modified to address the concerns of the commenter and to clarify that tests that cannot be conducted on such a basis do not need to be continually operated.

RESPONSE: R18-13-1511(H) is amended as follows:

H. Monitoring that can be performed in a continuous manner for pathogen and vector attraction reduction treatment operating parameters, such as time and temperature, shall be monitored on a continuous basis during treatment.

R18-13-1512.Recordkeeping

ISSUE: One commenter stated that R18-13-1512(B) should state that "except for the biosolids which meet Exceptional Quality criteria, records of cumulative pollutant levels of each regulated pollutant shall be retained indefinitely."

ANALYSIS: As previously discussed, ADEQ does not support the full exemption from recordkeeping for EQ biosolids. ADEQ is interested in monitoring the land application activities to ensure a successful biosolids program.

RESPONSE: No change to the rule in response to this comment, however, R18-13-1512(B)(6) has been amended to clarify the record-retention time-frame and (B)(7) has been amended to clarify the scope of the requirement.

6. The cumulative pollutant levels of each regulated pollutant (in ~~tons/kilograms~~ tons or kilograms per ~~acre/hectare~~ acre or hectare). These records shall be retained ~~indefinitely~~ permanently;

7. ~~Unless conducted by the preparer, the~~ The results of all pathogen density analyses, and applicable descriptions of the methods used for pathogen treatment pursuant to R18-13-1506;

R18-13-1513.Reporting

ISSUE: One commenter noted that R18-13-1513 required notice of subsequent land owners and lessees about site restrictions. Part 503 differs from this because Part 503 exempts Exceptional Quality biosolids from this requirement.

ANALYSIS: This comment points out a distinction in R18-13-1513 and Part 503. The commenter is requesting an exemption for EQ material which must meet Class A pathogen reduction. Under the state rule, Class A pathogen reduction does not result in any site restrictions.

RESPONSE: No change to the rule.

R18-13-1514.Enforcement

ISSUE: Some commenters expressed concern that the land application of biosolids will result in contamination to the groundwater and unnecessary costs to the taxpayers.

ANALYSIS: As previously discussed, ADEQ has had enforcement authority over the land application of biosolids since 1979. ADEQ conducts inspections, verifies complaints, and makes every effort to work with the applicators, generators, and transporters of biosolids. As also previously mentioned, there has been no known contamination found in Arizona's groundwater or in Arizona's crops that would impact human health and the environment. ADEQ has additional reporting beyond the requirements of 40

CFR 503, and fewer exemptions than are found in Part 503, to balance the cost of land application of biosolids with the concerns about environmental contamination. Experience with the Arizona Aquifer Protection Permit program has provided ADEQ with additional knowledge since establishing the requirements found in the general permit, R18-9-128. This rule retains the necessary elements of R18-9-128 in order to maintain the equivalent aquifer protection as found in the APP program.

RESPONSE: No change to the rule.

ISSUE: A commenter expressed concern that nuisance ordinances would not be adequate to protect the health and property rights of adjacent properties regarding offensive odors.

ANALYSIS: Nuisance ordinances are designed to give property owners recourse when a person interferes with another person's pleasure and enjoyment of their property. ADEQ has authority to abate an environmental nuisance under A.R.S. § 49-141, *et seq.* Cities and counties also generally have nuisance ordinances. These enforcement authorities should provide adequate protection without further amendment to the state biosolids rule.

RESPONSE: No change to the rule.

ISSUE: ADEQ on its own initiative deleted the discussion of legal defense in R18-13-1514(G).

ANALYSIS: ADEQ does not have the statutory authority to grant or deny defenses of this nature in this Article.

RESPONSE: R18-13-1514(G) has been deleted as follows:

G. A person's failure to use due care, observe proper operational practices, or perform routine maintenance shall not be a defense to an enforcement action under this Article.

APPENDIX B.An Example Calculation to Determine the Available Nitrogen in Biosolids

ISSUE: Numerous commenters requested clarification of this example calculation.

ANALYSIS: Appendix B of 18 A.A.C. 13, Article 15 confused many commenters. Similar calculations are produced in an EPA guidance, therefore the Appendix will not be included.

RESPONSE: The entire Appendix B is deleted from 18 A.A.C. 13, Article 15.

CONCISE EXPLANATORY STATEMENT

ADDENDUM

The following comments came from interested parties, the Governor's Regulatory Review Council (GRRC) and GRRC staff. To ensure the regulated community and the public can distinguish the difference between pre-adoption changes and post-adoption changes, this addendum contains only the issues and noted changes that came about post-adoption. All changes were approved by the Governor's Regulatory Review Council. All changes made to the adopted rule are noted in the attachment to this addendum.

I. Response to GRRC staff comments.

ISSUE: The GRRC staff comments state that the monitoring and recordkeeping requirements of the rule may be too burdensome for the end-user.

ANALYSIS: The monitoring is a requirement prior to the biosolids being received by the end-user. The information regarding biosolids quality and volumes should be known by the distributor or applicator, and is not a direct burden on the end-user.

The recordkeeping requirements are implicitly imposed on the person who prepares biosolids and the applicator. Therefore, the end-user is only affected if it is also the applicator. The Department has responded to comments to further reduce possible requirements on the end-user by recommending that all exceptional quality biosolids be treated as composted biosolids are under the adopted rule. Please refer to the discussion of this change under "III. RESPONSES TO COMMENTS FROM WASTEWATER TREATMENT FACILITIES; BLENDERS, TRANSPORTERS, AND APPLICATORS OF BIOSOLIDS."

ISSUE: Is the Department's rulemaking with respect to R18-9-105 and R18-9-128 invalid by failure of ADEQ to substantially comply with the Administrative Procedures Act (APA)?

ANALYSIS: GRRC staff has recommended that the Council return the rulemaking that affects Title 18, Chapter 9, relating to aquifer protection permits. The staff concludes that this rulemaking is invalid because of ADEQ's failure to comply with the requirements of the APA regarding filing a Notice of Docket Opening and a Notice of Proposed Rulemaking. ADEQ asserts that it has followed the letter and the spirit of the Administrative Procedures Act.

Disposition of this issue requires the Council to measure ADEQ's actions against the following requirements of law:

A.R.S. § 41-1030 provides:

"A rule is invalid unless adopted and approved in substantial compliance with Sections 41-1021 through 41-1029, Section 41-1036 and articles 4, 4.1 and 5 of this chapter, unless otherwise provided by law."

A.R.S. § 41-1021 provides in pertinent part:

"A. Each agency shall establish and maintain a current, public rule making docket for each pending rule making proceeding....

B. For each rule making proceeding, the docket shall indicate all of the following:

1. The subject matter of the proposed rule.

2. A citation to all published notices relating to the proceeding.

3. The name and address of agency personnel with whom persons may communicate regarding the rule.

5. The time during which written submissions may be made and the time and place where oral comments may be made.

8. Any known timetable for agency decisions or other action in the proceeding.

C. The agency shall provide public notice of the establishment of rule making docket by causing a notice of docket opening to be published in the register, including the information set forth in subsection B, paragraphs 1, 2, 3, 5, and 8 of this Section."

A.R.S. § 41-1022 provides in pertinent part:

"A. Before the adoption, amendment, or repeal of any rule, the agency shall file a notice of the proposed action with the secretary of state. The notice shall include:

1. The preamble.

2. The exact wording of the rule."

There are additional statutory provisions that are relevant to this analysis, but that are not set out here. These include the requirements of A.R.S. § 41-1023 that an agency afford persons the opportunity to make comments on the rule, and the requirement of A.R.S. § 41-1024 that an agency consider the written and oral submissions on the rule.

The Notice of Docket Opening appeared in the Arizona Administrative Register on February 17, 1995. The Notice of Proposed Rulemaking appeared in the Arizona Administrative Register on June 30, 1995.

The GRRC staff assertion that the 18 A.A.C. 9 rulemaking is invalid is based on 2 points: 1) there is no Notice of Docket Opening for R18-9-105 and R18-9-128, and 2) the Notice of Proposed Rulemaking for R18-9-128 does not include R18-9-105.

Notice of Docket Opening

The Notice of Docket Opening identifies the subject matter of the proposed rule as establishing "a regulatory control program ...(for)...activities related to the beneficial use of biosolids, also known as sewage sludge, placed on lands in the state...." The Notice cites the place (Chapter 13, at that point a non-existent chapter) in the Arizona Administrative Code (AAC) where ADEQ thought the rules would be codified. In fact, the rule numbers cited were later changed when the Notice of Proposed Rulemaking was published.

The fact that the Notice of Docket Opening does not mention that changes to existing aquifer protection permit rules might be needed to regulate the beneficial use of biosolids does not render the docket opening invalid for supporting a later rulemaking specifically amending the aquifer protection permit rules.

A.R.S. § 41-1021 does not require that a Department cite specific rule Sections that will or may be affected. The statute only requires that an agency indicate the subject matter of the rule making. The statute does not elaborate on what constitutes an adequate indication of the subject matter of the rulemaking.

ADEQ understands the published Notice of Docket Opening to be a general alert to the public of an agency's intention to engage in regulatory development. At this early stage of regulatory development, it is often not known by ADEQ exactly what must be done to accomplish the Department's intent. The Notice of Docket Opening should be understood as an early signal to interested parties that they should be watching for a subsequent Notice of Proposed Rulemaking or notices of other public meetings and workshops regarding the issue. This understanding is based on the plain reading of the statute and ADEQ's participation in the legislative efforts at regulatory reform that resulted in the Notice of Docket Opening publication requirement.

The Council should consider the implications of an interpretation of the APA that requires specific Notices of Docket Opening. ADEQ has heard repeatedly from its regulated community that they want early warning of impending regulatory activity. A general statement of the subject matter is adequate at this stage. If rulemakings are invalidated for failure to be sufficiently specific, agencies will wait until they are ready to file Notices of Proposed Rulemaking before filing Notices of Docket Opening. This will tend to collapse together what are now intended as 2 separate steps, and diminish the usefulness of the Notice of Docket Opening.

Notice of Proposed Rulemaking

GRRC staff further argues for invalidating the Title 18, Chapter 9 rulemaking based on the failure of ADEQ to include R18-9-105 in the Notice of Proposed Rulemaking.

This issue requires an interpretation of A.R.S. § 41-1022 which states that an agency shall include the exact wording of the proposed rule. The Council should not necessarily consider a discrepancy between a Notice of Proposed Rulemaking and an adopted rule to be a failure to give proper notice. Simply comparing the number of Sections affected between the proposed and adopted rules is an excessively narrow approach to establishing whether adequate notice has been given and 1 that is not compelled by the terms of the statute.

The test for the adequacy of the Notice of Proposed Rulemaking should be whether the public received adequate notice that their

interests might be affected. In this case, the Notice of Proposed Rulemaking for 18 A.A.C. 9 is quite clear about ADEQ's intent to consolidate the regulatory provisions of Chapter 9 with new biosolids provisions in Chapter 13. Anyone having an interest in how the 2 regulatory programs would fit together received notice of ADEQ's intent to transfer regulatory coverage for the agricultural application of biosolids from the existing Aquifer Protection Permit program to the new biosolids program.

The Notice of Proposed Rulemaking for 18 A.A.C. 9 was effective in giving the public notice of ADEQ's intent to shift regulatory responsibility from 1 program to another. Indeed, the notice was so effective that commenters relayed to ADEQ by telephone that another Section (R18-9-105) needed to be amended to fully implement ADEQ's well-stated intent.

When comparing changes between the proposed and adopted rule, the test is whether a change is a substantial change. A.R.S. § 41-1052(C)(7). Substantial differences between the proposed and adopted rule are determined by looking at whether the persons affected should have understood that their interests were being affected, the extent to which the subject matter is different, and the extent to which the effects of the proposed rule differed from that which is adopted. The adopted rule at issue here is substantially the same as that originally proposed. The addition of the R18-9-105 only made the rule legally consistent and did not introduce a substantial change.

ADEQ requested that the Council approve the 18 A.A.C. 9 rulemaking. The Council denied this request and returned 18 A.A.C. 9.

ISSUE: ADEQ appreciates the support of the GRRC staff to retain language from 40 CFR 503, where the passive voice has been used in the federal regulations.

ANALYSIS: ADEQ recommends the following changes, as grammatical improvements, where no change in meaning will result. The Sections appear in the order in which the GRRC staff discussed them.

RESPONSE: The changes are noted below:

R18-13-1508(B). Site Restrictions

3. ~~This document shall be signed by~~ A responsible official of the applicator shall sign this document and include the following statement:

R18-13-1510. Transportation

A. ~~Trucks, trailers, rail-cars, or other vehicles used to transport~~ A transporter of bulk biosolids into and within Arizona shall use trucks, trailers, rail-cars, or other vehicles ~~be~~ which are covered to prevent blowing of materials and ~~be~~ are leakproof. ~~and comply with the requirements found in R18-8-510 or R18-8-612.~~

B. A transporter of bulk biosolids into and within Arizona shall comply with the requirements found in R18-8-510 or R18-8-612.

~~B.~~C. ~~Trucks, trailers, rail-cars, or other vehicles used to transport~~ A transporter of biosolids shall ~~be~~ periodically ~~cleaned~~ clean any trucks, trailers, rail-cars, or other vehicles used to transport biosolids to prevent odors or insect breeding. ~~Tank vehicles used to transport commercial or industrial septage, or restaurant grease-trap wastes, which are also to be used to haul domestic septage;~~ A transporter shall ~~be cleaned~~ clean all tank vehicles used to transport commercial or industrial septage, or restaurant grease-trap wastes, which are also to be used to haul domestic septage, before loading the domestic septage to ensure that mixing of wastes does not occur.

~~C.~~D. In the event bulk biosolids are spilled while being transported, the transporter shall undertake the following activities:

1. ~~Spillage, including any visibly discolored soil, shall be picked up immediately by~~ The transporter shall immediately pick up any spillage, including any visibly discolored soil, unless otherwise determined by the Department on a case-by-case basis.

2. Within 24 hours of the spill, the transporter shall notify the Department of the spill, and shall submit written notification within 7 days. This written notification shall include the location of the spill, the reason it occurred, the amount of biosolids spilled, and the steps taken to clean up the spill.

R18-13-1506. Pathogen Controls

A. An applicator shall ensure that all biosolids applied to land ~~shall~~ meet either Class A or Class B pathogen reduction as described in this Section, at the time the biosolids are land applied.

R18-13-1509. Vector Attraction Reduction

A. Except as provided in subsection (B), an applicator or ~~generator~~ person who prepares biosolids shall use 1 of the following vector attraction reduction procedures when biosolids are land-applied:

R18-13-1513. Reporting

A. A person who prepares biosolids for application shall provide the applicator written notification of the pollutant concentrations, including total nitrogen (as N on a dry-weight basis) in accordance with R18-13-1503(~~B~~ C).

ISSUE: ADEQ has continued to negotiate language for bright line standards in the Management Practices to allow land application of biosolids for land reclamation. An explanation of the issues and how ADEQ responded to them are outlined below.

II. ADMINISTRATIVE RULES OVERSIGHT COMMITTEE RECOMMENDATION:

On December 19, 1995 a meeting was held with the Administrative Rules Oversight Committee to discuss concerns about the impact of the rule package on land reclamation with biosolids. Subsequent to the December 19th meeting, ADEQ continued to work on resolution of the issues such as a response to staff's comments, and meetings in February with stakeholders. The rule package was adopted before all of these issues were resolved. Therefore, ADEQ requests the Council to consider and approve the following changes to the rule.

ADEQ has always intended for this rule package to establish specific standards that can be followed, measured, and verified, thereby eliminating the need for a permit. A permit should only be issued when there are such unique conditions that a case-by-case review is required by ADEQ. However, the standards in the Management Practices Section substantially impacted land reclamation with biosolids. ADEQ supports land reclamation with biosolids, and the economic impact statement assumed that most mining reclamation sites would be able to land apply biosolids. ADEQ wants the rule package to reflect this support in a manner that is protective of the environment and the public health.

The deletions are marked with a strike through and the new language is underlined.

ISSUE: "Surface water" as defined in the biosolids rule includes intrastate waters that are not connected to interstate commerce (a broader scope than "waters of the United States").

ANALYSIS: ADEQ purposefully modified this definition to include additional protections not found in the definition of "surface waters." Upon further review ADEQ concluded that a single definition for this term was more appropriate. ADEQ does believe that the definition will be protective enough of the human health and the environment. Surface waters has the same scope as "waters of the United States."

RESPONSE: R18-13-1502 is amended as follows:

R18-13-1502. Definitions

44. "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, 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:

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 or foreign commerce;

d. All impoundments of surface waters;

e. Tributaries of surface waters; and

f. Wetlands.

ISSUE: The adopted rule contains the following prohibitions:

1) Application to soil with a pH of less than 6.5.

2) Application to land with slopes greater than 6%.

3) Application of biosolids with Class B pathogen reduction ... where the depth to groundwater is 40 feet or less.

4) Application of biosolids within 32.8 feet (10 meters) of "surface waters".

5) Application of biosolids at a rate that is greater than the agronomic rate of the vegetation present or crop grown at the site.

6) Application at a rate which exceeds the hydraulic loading rate.

ANALYSIS: While the requirements found in the Management Practices reflect a combination of requirements for the federal regulations, the requirements prohibit land reclamation of mine tailings. The federal regulations did not offer a bright line standard, rather they stated that the state rule can "provide an alternative." Therefore, ADEQ reviewed the requirements the mines could meet, and ensured that the proposed limits adequately maintain protection of the environment. ADEQ desired a standard in the rule to eliminate the permit process, if possible.

ADEQ believed the site restrictions were reasonable considering that land application of biosolids is performed in many non-agriculture settings. However, when the requirements are considered in non-agricultural uses, maintaining the distance from surface water is less appropriate because of the need for vegetating banks, certain dredge and fill conditions, and modifications of banks

near surface waters to enable better land usage.

RESPONSE: The following changes are a result of review and analysis by ADEQ and the regulated community. Additionally, the changes are a solution to the AROC recommendation.

R18-13-1507. Management Practices

A. An applicator of non-composted bulk biosolids shall comply with the following management practices at each land application site:
   1. Biosolids shall not be applied to soil with a pH of less than 6.5 at the time of the sludge application, unless the biosolids are either treated pursuant to 1 of the following procedures R18-13-1506(D)(2), R18-13-1506(E)(3), or R18-13-1509(A)(6); or the soil and biosolids mixture has a pH of 6.5 or higher immediately after land application.
   2. Biosolids shall not be applied to land with slopes greater than 6%, unless the site is operating pursuant to an applicable permit issued pursuant to the CWA.
   3. Biosolids shall not be applied to land under the following conditions:
      a. Biosolids with Class A pathogen reduction shall not be applied to land where the depth to groundwater is 5 feet (1.52 meters) or less.
      b. Biosolids with Class B pathogen reduction shall not be applied to land where the depth to groundwater is 10 feet (3.04 meters) or less.
      c. Biosolids with Class B pathogen reduction shall not be applied to gravel, coarse or medium sands, and sands with >15% coarse fragments where the depth to groundwater is 40 feet (12.2 meters) or less from the point of application of biosolids.
   4. Biosolids shall not be applied to land that is 32.8 feet (10 meters) or less from surface water so that the biosolids enter the surface water or leach substances in concentrations that exceed water quality standards.
   5. Biosolids shall not be stored or applied closer than 1000 feet (305 meters) from a public or semi-public drinking water supply well, and no closer than 250 feet (76.2 meters) from any other water well.
   6. Biosolids shall not be stored or applied within 25 feet (7.62 meters) of a public right-of-way or private property line unless the applicator receives permission to apply biosolids from the land owner or lessee of the adjoining property.
   7. Biosolids shall not be applied at an application rate that is greater than the agronomic rate of the vegetation present or crop grown on the site, except in the case of a reclamation site which may not exceed the agronomic rate averaged over a 5 year period.
   8. ~~Biosolids, including~~ Domestic septage, and any other biosolids with less than 10% solids, shall not be applied at a rate which exceeds the ~~hydraulic loading~~ annual application rate ~~The hydraulic loading rate,~~ which is calculated, in gallons per acre per 365-day period, ~~is calculated~~ by dividing the amount of nitrogen needed by the crop or vegetation grown on the land, in pounds per acre per 365-day period, by 0.0026. ~~The hydraulic loading rate shall not exceed 27,000 gallons per acre per application.~~
   9. Bulk biosolids shall not be applied to land that is flooded, frozen, or snow-covered, so that the bulk biosolids enter a wetland or other surface water, except as provided in a permit issued pursuant to Section 402 or 404 of the CWA or an equivalent state permit.
   10. Once a site has received biosolids containing nitrogen at the equivalent of the agronomic rate appropriate for that site, a crop must be grown on the site prior to any additional biosolids application.
   11. Irrigation of an application site shall not exceed the needs of the crop.
   12. To minimize odors, biosolids applied within 1,000 feet (305 meters) of a dwelling shall be injected or incorporated into the soil within 10 hours of being applied.

ISSUE: Public access to land with a low potential for human contact is restricted for 30 days after application is more restrictive than the requirement found in the federal regulations. Furthermore, most sites have a potential for "human contact" since employees have contact, with the biosolids during application and incorporation.

ANALYSIS: The use of "human contact" was an oversight and should have been "human exposure." The regulated community was concerned that the adopted language would essentially prohibit a human from applying the biosolids.

RESPONSE: The deletions are marked with a strike through and the new language is marked by underlined. R18-13-1508 is amended as follows:

R18-13-1508. Site Restrictions

A.7.Public access to land with a low potential for ~~human contact~~ public exposure shall be restricted for 30 days after application.

ISSUE: The chromium limit was retained in the ceiling pollutant concentration and the annual pollutant loading rate; however, the federal regulations do not require these limits.

ANALYSIS: ADEQ retained these limits because it was consistent with the underlying belief that overloading of certain pollutants such as chromium can occur. The limit was believed to be achievable when land application is done properly. Further review revealed, that if the ceiling pollutant level is complied with, the annual pollutant loading rate is probably not necessary.

RESPONSE: ADEQ recommends Chromium be removed from the following table.

R18-13-1505. Pollutant Concentrations.

Table 3. Annual Pollutant Loading Rates

Pollutant	Loading rate (in kilograms per hectare) {1}
Arsenic	2.0
Cadmium	1.9
~~Chromium~~	~~150.0~~
Copper	75.0
Lead	15.0
Mercury	0.85
Nickel	21.0
Selenium	5.0
Zinc	140.0

{1} Dry-weight basis.

III. RESPONSES TO COMMENTS FROM WASTEWATER TREATMENT FACILITIES; BLENDERS, TRANSPORTERS, AND APPLICATORS OF BIOSOLIDS THAT CAME ABOUT AFTER THIS RULE WAS ADOPTED

ISSUE: R18-13-1504(C) states that all applicators shall submit a request for registration. As written this applies to all biosolids except bagged biosolids. The commenter believed that compost with Class A Pathogen Reduction would not need to register the sites where the compost would be applied. The rule does not expressly exempt compost from applicator registration.

ANALYSIS: The proposed rule intended to exempt composted biosolids from site specific applicator registration; therefore, the rule should be modified to reflect this.

RESPONSE: R18-13-1504 is recommended to be amended as follows:

R18-13-1504.Applicator Registration, Bulk Biosolids

C. The request for registration for all biosolids that are not exceptional quality shall include the following information. The request for registration for exceptional quality biosolids shall include information in subsections (1) through (4).

1. The name, address, and telephone number of the applicator and any agents of the applicator.
2. The name and telephone number of a primary contact person who has specific knowledge of the land application activities of the applicator.
3. Whether the applicator holds a National Pollutant Discharge Elimination System (NPDES) permit, or state equivalent and, if so, the permit number.
4. The identity of the person or persons who will prepare the biosolids for land application, if different from the applicator.
5. Unless the information is already on file at the Department as part of an approved land-application plan, for each site on which land application is anticipated to take place, the following information:

ISSUE: R18-13-1505(D)(2) indicates that soil samples should be taken to identify information about a site that had previously received biosolids. Soil samples do not indicate the volume of biosolids which have been applied. The commenter recommended that ADEQ use 1993, as in 40 CFR 503, as a baseline for beginning monitoring soil, and use 1978 as a baseline date for monitoring the original 5 metals previously required by ADEQ.

ANALYSIS: Although the soil samples do not precisely state the previous applications of biosolids, the metal levels in the soil provide information to determine the safe loading levels of biosolids metals. When analytical analyses of biosolids are available to determine the previous metal loading, using the analytical results is the preferred method to determine the allowable metal loading levels. Since cumulative loading has been required for 5 of the metals, soil sampling should not be performed for these 5 metals. Additional metal analyses were also required and therefore these results are expected to be the source of the cumulative metal

loading information.

RESPONSE: ADEQ does not recommend a change to the rule in response to this comment. ADEQ believes the rule responds to the commenter's concern as adopted.

ISSUE: R18-13-1509(A)(1) contains calculation procedures which are not incorporated by reference. Please incorporate the document by reference or include the pages from the document in the rule text.

ANALYSIS: ADEQ attempted to avoid incorporating more documentation than necessary into the rule. However this has created more ambiguity than expected. As ADEQ does intend, that the calculations be performed by the method referenced, the relevant portions of the document shall be incorporated by reference.

RESPONSE: R18-13-1504 is recommended to be amended as follows:

R18-13-1509. Vector Attraction Reduction

A. Except as provided in subsection (B), an applicator or generator shall use 1 of the following vector attraction reduction procedures when biosolids are land-applied:

1. Reducing the mass of volatile solids by a minimum of 38% using the calculation procedures set out in "Environmental Regulations and Technology -- Control of Pathogens and Vector Attraction in Sewage Sludge", (EPA-625/R-92/013, 1992, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268) incorporated herein by reference, and no further editions, and is on file with the Department and the Secretary of the state.

ISSUE: Exceptional Quality biosolids deserves to have fewer requirements in the rule because they cannot adversely impact human health or the environment. EQ biosolids are pathogen free and when land applied in controlled applications, are especially not noteworthy of tracking at the level required by this rule. One commenter has been testing the metals in the soil/sludge mixture during 10 years of land application of biosolids to the same site, the soil/sludge mixture had non-detect levels of metals. ADEQ needs to recognize Exceptional Quality biosolids at least on an operational scale, i.e. no cumulative metals and no management practices, since the reporting requirements are excessive.

ANALYSIS: ADEQ does recognize the benefits and quality of the biosolids which meet the Exceptional Quality. ADEQ would not expect an elevated level of metals after 10 years of application. This rule package is written to manage a biosolids program far in excess of 10 years. Therefore, ADEQ must consider the integrity of the program when writing the rule. ADEQ considered the burdens on the regulated community with the reporting, the burden on ADEQ when researching a question or problem, and the burden on the public when seeking answers to the questions about the land application. ADEQ concludes that it is reasonable to treat all Exceptional Quality biosolids as compost was treated in the adopted rule.

RESPONSE: All references to compost have been amended to exceptional quality biosolids. A definition for exceptional quality biosolids has been added, and the definition of compost has been removed.

ISSUE: R18-13-1507(A)(12), page 92, a buffer zone must be maintained by either injection or incorporation or not applying biosolids within 1,000 feet of a dwelling. The incorporation or injection is to minimize odor. Why does ADEQ need to consider odor when there are other nuisance statutes that address odor. Furthermore, the buffer zone does not solve a health or environmental problem.

ANALYSIS: The incorporation buffer is less restrictive than the requirement that all land application of biosolids be incorporated regardless of location.

RESPONSE: No change to the rule.

ISSUE: R18-13-1507(A)(11) states that irrigation may not exceed the "need of a crop." The commenter expressed concern that ADEQ inspectors would interpret the "need of the crop" inconsistently. The commenter requested this subsection be re-written to address the concern for run-off.

ANALYSIS: ADEQ used the statement "need of the crop" based upon an understanding that the usage of water goes beyond the evapotranspiration rate. The proposed rule was limited to the "consumptive use and the evapotranspiration needs" of the crop. An end user requested this be changed to the term "need of the crop."

RESPONSE: No change to the rule.

ISSUE: Review of R18-13-1511(H) revealed confusion about the meaning of monitoring on a continuous basis. The NPDES program uses "continuous" when it means non-intermittent monitoring devices. The commenter is concerned that the interpretation of "continuous" requires "around the clock" monitoring.

ANALYSIS: ADEQ intended that "continuous" mean "intermittent." However, further review revealed that "continual" is the correct term for intermittent but as continuous as possible.

RESPONSE: ADEQ recommends the following changes in response to the comment: R18-13-1511

H. Monitoring that can be performed in a ~~continuous~~ continual manner for pathogen and vector attraction reduction treatment operating parameters, such as time and temperature, shall be monitored on a ~~continuous~~ continual basis during treatment.

ATTACHMENT 1

COMPILATION OF ALL RECOMMENDED CHANGES

Section

R18-13-1501.Applicability

R18-13-1502.Definitions

R18-13-1503.General Requirements

R18-13-1504.Applicator Registration, Bulk Biosolids

R18-13-1505.Pollutant Concentrations

R18-13-1506.Pathogen ~~Controls~~ Reduction Requirements

R18-13-1507.Management Practices

R18-13-1508.Site Restrictions

R18-13-1509.Vector Attraction Reduction

R18-13-1510.Transportation

R18-13-1511.Self-monitoring

R18-13-1512.Recordkeeping

R18-13-1513.Reporting

R18-13-1514.Enforcement

Appendix AProcedures to Determine Annual Biosolids Application Rates

R18-13-1501.Applicability

A. This Article ~~shall apply~~ applies to any person who prepares biosolids for land application, to transporters of biosolids that are to be land-applied, to the applicator of biosolids, and to the land owner and lessee of land to which biosolids have been applied.

D. The Department may permit the land application of biosolids in a manner which differs from any of the requirements in R18-13-1507 but is otherwise consistent with this Article ~~may be permitted~~ under the aquifer protection permit program established by A.R.S. Title 49, Chapter 2, Article 3, and 18 A.A.C. 9, Article 1.

R18-13-1502. Definitions

The terms used in this Article ~~shall~~ have the following meanings:

7. "Biosolids" means sewage sludge, including ~~composted~~ exceptional quality biosolids, which is placed on, or applied to the land in order to use the beneficial properties of the material as a soil amendment, conditioner, or fertilizer. Biosolids do not include any of the following:

12."Compost" or "composted biosolids" means biosolids which meet Class A pathogen reduction and which have undergone a controlled, aerobic, or anaerobic, high temperature, accelerated biological decomposition process which converts biosolids and other solid organic matter into a stable, humus-like mixture through the optimal growth and activity of naturally occurring, mixed populations of bacteria and fungi that are indigenous to the organic matter being composted.

#. "Exceptional quality biosolids" means biosolids which meet, and have been certified under R18-13-1512 as meeting the pollutant concentrations in R18-13-1505 Table 2, Class A pathogen reduction in R18-13-1506, and 1 of the vector attraction reduction requirements in R18-13-1509, paragraphs (1) through (8).

31. "Person who prepares biosolids" means either the person who generates the biosolids during the treatment of domestic sewage in a treatment works, packages the biosolids, or ~~the person who~~ derives a new product from the biosolids either through processing or by combining it with another material, including blending several biosolids together.

44. "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, 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:

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 or foreign commerce;

   d. All impoundments of surface waters;

   e. Tributaries of surface waters; and

   f. Wetlands.

R18-13-1503. General Requirements

B. The management practices in R18-13-1507 do not apply when biosolids are ~~sold or given away in a bag or other container for application to the land if the biosolids meet~~ exceptional quality biosolids. ~~the pollutant concentrations in R18-13-1505 Table 2, the Class A pathogen reduction in R18-13-1506, and 1 of the vector attraction reduction requirements in R18-13-1509, paragraphs (1) through (8).~~

E. The land owner or lessee of land on which bulk ~~non-composted~~ biosolids which are not exceptional quality biosolids have been applied shall notify any subsequent land owner and lessee of all previous land applications of biosolids and ~~will~~ shall disclose any of the site restrictions listed in R18-13-1508, which are still in effect at the time the property is transferred.

R18-13-1504. Applicator Registration, Bulk Biosolids

A. Any person intending to land-apply bulk biosolids in Arizona shall submit, on a form provided by the Department, a completed "Request for Registration". ~~An~~ Any current applicator shall submit this request by June 15, 1996.

B. ~~No~~ An applicator shall not engage in land application of bulk biosolids after July 15, 1996, unless the applicator has obtained a written acknowledgment of the request for registration from the Department.

C. The request for registration for all biosolids except exceptional quality biosolids shall include the following information. The request for registration for exceptional quality biosolids shall include information in paragraphs (1) through (4).

5.b. The physical location of the site by county; and legal description, including township, range, and Section; ~~county;~~ or latitude and longitude at the center of the parcel;

f. For sites on which biosolids have not been applied as of the effective date of this Article, proof of public notice of the potential use of the site for land application of biosolids by the placement of a notice in the largest newspaper in general circulation in the area in which the site is located. In order to satisfy this requirement, the notice shall appear at least once per week for at least 2 consecutive weeks. In the event a site is not used for land application for a period of 3 consecutive years or more, the applicator shall renotice the site ~~shall be renoticed~~ prior to its use.

D. A responsible official of the applicator shall sign the request for registration ~~shall be signed by a responsible official of the applicator~~.

R18-13-1505. Pollutant Concentrations

B. A person shall not apply ~~composted~~ exceptional quality biosolids that exceed any of the monthly average pollutant concentrations set out in Table 2 of this Section.

C. A person shall not apply ~~non-composted~~ bulk biosolids which are not exceptional quality biosolids to a site on which the annual pollutant loading rates in Table 3 of this Section will be exceeded. Annual application rates shall be determined using the methodology set out in Appendix A.

D. A person shall not apply ~~non-composted~~ bulk biosolids which are not exceptional quality biosolids to a site where any of the cumulative pollutant loading rates in Table 4 of this Section will be exceeded. Compliance with the cumulative pollutant rates shall be determined using the following:

2. An applicator shall calculate the existing cumulative level of the pollutants set out in Table 4 using either actual analytical data from the application events, or background concentrations determined by taking representative soil samples of the site, when it is known that the site received biosolids before April 1996.

Table 3.Annual Pollutant Loading Rates

Pollutant	Loading rate (in kilograms per hectare) {1}
Arsenic	2.0
Cadmium	1.9
Chromium	150.0
Copper	75.0

Lead 15.0

Mercury 0.85

Nickel 21.0

Selenium 5.0

Zinc 140.0

{1} Dry-weight basis.

R18-13-1506.Pathogen ~~Controls~~ Reduction Requirements

A.An applicator shall ensure that all biosolids applied to land ~~shall~~ meet either Class A or Class B pathogen reduction as described in this Section, at the time the biosolids are land applied.

D.Biosolids satisfy the Class A pathogen reduction when the density of either fecal coliform is less than 1000 Most Probable Number per gram of total solids (dry-weight basis), or the density of *Salmonella sp.* bacteria is less than 3 Most Probable Number per 4 grams of total solids (dry-weight basis); and any 1 of the following 11 alternative pathogen treatment options is used:

1.Alternative 1 -- The pathogen treatment process meets 1 of the following time and temperature requirements:

a. When the percent solids are 7% or greater, the temperature of the biosolids shall be held at 50°C for at least 20 minutes; except when the biosolids are heat-treated by either warmed gases or an immiscible liquid, in which case the requirements of subsection (D)(1)(b) of this Section shall be met.

b. When the percent solids are 7% or greater, and the biosolids are heat-treated by either warmed gases or an immiscible liquid, a temperature of 50°C shall be held for at least 15 seconds; in the event a higher temperature is held, the exact time period may be calculated using the following equation:

$$D = \frac{131{,}700{,}000}{10^{[0.1400t]}}$$

Where: D = time in days, and

t = temperature in degrees Celsius.

c. When the percent solids are less than 7%, the temperature of the biosolids shall be held at 50°C for at least 30 minutes. In the event a higher temperature is held, the exact time period may be calculated using ~~higher~~ the following equation:

d. When the percent solids are less than 7%, and the time of heating is at least 15 seconds, but less than 30 minutes, the exact time and temperature to be maintained is calculated using ~~higher~~ the following equation:

E.6.Alternative 6 -- Composting. Using either the within-vessel, static-aerated-pile or windrow composting methods, the temperature of the biosolids is raised to 40°C or higher for 5 consecutive days. For at least 4 hours during the 5 days, the temperature in the compost pile shall exceed 55°C. ~~This alternative does not meet the definition of composted found in R18-13-1502.~~

R18-13-1507.Management Practices

A.An applicator of ~~non-composted~~ bulk biosolids which are not exceptional quality biosolids shall comply with the following management practices at each land application site:

1. Biosolids shall not be applied to soil with a pH of less than 6.5 at the time of the sludge application, unless the biosolids are either treated pursuant to 1 of the following procedures R18-13-1506(D)(2), R18-13-1506(E)(3), or R18-13-1509(A)(6); or the soil and biosolids mixture has a pH of 6.5 or higher immediately after land application.

2.Biosolids shall not be applied to land with slopes greater than 6%, unless the site is operating pursuant to an applicable permit issued pursuant to the CWA.

3.Biosolids shall not be applied to land under the following conditions:

a. Biosolids with Class A pathogen reduction shall not be applied to land where the depth to groundwater is 5 feet (1.52 meters) or less.

b. Biosolids with Class B pathogen reduction shall not be applied to land where the depth to groundwater is 10 feet (3.04

meters) or less.

c. Biosolids with Class B pathogen reduction shall not be applied to gravel, coarse or medium sands, and sands with >15% coarse fragments where the depth to groundwater is 40 feet (12.2 meters) or less from the point of application of biosolids.

4.Biosolids shall not be applied to land that is 32.8 feet (10 meters) or less from surface water so that the biosolids enter the surface water or leach substances in concentrations that exceed water quality standards.

5.Biosolids shall not be stored or applied closer than 1000 feet (305 meters) from a public or semi-public drinking water supply well, and no closer than 250 feet (76.2 meters) from any other water well.

6.Biosolids shall not be stored or applied within 25 feet (7.62 meters) of a public right-of-way or private property line unless the applicator receives permission to apply biosolids from the land owner or lessee of the adjoining property.

7.Biosolids shall not be applied at an application rate that is greater than the agronomic rate of the vegetation ~~present~~ or crop grown on the site, except in the case of a reclamation site which may not exceed the agronomic rate averaged over a 5 year period.

8.~~Biosolids, including~~ Domestic septage, and any other biosolids with less than 10% solids, shall not be applied at a rate which exceeds the ~~hydraulic loading~~ annual application rate ~~The hydraulic loading rate,~~ which is calculated, in gallons per acre per 365-day period, ~~is calculated~~ by dividing the amount of nitrogen needed by the crop or vegetation grown on the land, in pounds per acre per 365-day period, by 0.0026. ~~The hydraulic loading rate shall not exceed 27,000 gallons per acre per application.~~

9.Bulk biosolids shall not be applied to land that is flooded, frozen, or snow-covered, so that the bulk biosolids enter a wetland or other surface water, except as provided in a permit issued pursuant to Section 402 or 404 of the CWA or an equivalent state permit.

10.Once a site has received biosolids containing nitrogen at the equivalent of the agronomic rate appropriate for that site, a crop must be grown on the site prior to any additional biosolids application.

11.Irrigation of an application site shall not exceed the needs of the crop.

12.To minimize odors, biosolids applied within 1,000 feet (305 meters) of a dwelling shall be injected or incorporated into the soil within 10 hours of being applied.

R18-13-1508. Site Restrictions

A. The following site restrictions shall apply to land where biosolids, which do not meet the Class A pathogen ~~control~~ reduction requirements set out in R18-13-1506, have been land-applied:

7. Public access to land with a low potential for ~~human contact~~ public exposure shall be restricted for 30 days after application.

B.3. ~~This document shall be signed by~~ A responsible official of the applicator shall sign this document and include the following statement:

R18-13-1509. Vector Attraction Reduction

A. Except as provided in subsection (B), an applicator or ~~generator~~ person who prepares biosolids shall use 1 of the following vector attraction reduction procedures when biosolids are land-applied:

1. Reducing the mass of volatile solids by a minimum of 38% using the calculation procedures set out in "Environmental Regulations and Technology -- Control of Pathogens and Vector Attraction in Sewage Sludge", (EPA-625/R-92/013, 1992, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268) incorporated herein by reference, and no further editions, and on file with the Department and the Secretary of the state.

R18-13-1510. Transportation

A. ~~Trucks, trailers, rail-cars, or other vehicles used to transport~~ A transporter of bulk biosolids into and within Arizona shall use trucks, trailers, rail-cars, or other vehicles ~~be~~ which are covered to prevent blowing of materials and ~~be~~ are leakproof. ~~and comply with the requirements found in R18-8-510 or R18-8-612.~~

B. A transporter of bulk biosolids into and within Arizona shall comply with the requirements found in R18-8-510 or R18-8-612.

~~B.~~**C.** ~~Trucks, trailers, rail-cars, or other vehicles used to transport~~ A transporter of biosolids shall ~~be~~ periodically ~~cleaned~~ clean any trucks, trailers, rail-cars, or other vehicles used to transport biosolids to prevent odors or insect breeding. ~~Tank vehicles used to transport commercial or industrial septage, or restaurant grease-trap wastes, which are also to be used to haul domestic septage,~~ A transporter shall ~~be cleaned~~ clean all tank vehicles used to transport commercial or industrial septage, or restaurant grease-trap wastes, which are also to be used to haul domestic septage, before loading the domestic septage to ensure that mixing of wastes does not occur.

~~C.~~**D.** In the event bulk biosolids are spilled while being transported, the transporter shall undertake the following activities:

1. ~~Spillage, including any visibly discolored soil, shall be picked up immediately by~~ The transporter shall immediately pick up any spillage, including any visibly discolored soil, unless otherwise determined by the Department on a case-by-case basis.

2. Within 24 hours of the spill, the transporter shall notify the Department of the spill, and shall submit written notification within 7 days. This written notification shall include the location of the spill, the reason it occurred, the amount of biosolids spilled, and the steps taken to clean up the spill.

R18-13-1511. Self-monitoring.

H. Monitoring that can be performed in a ~~continuous~~ continual manner for pathogen and vector attraction reduction treatment operating parameters, such as time and temperature, shall be monitored on a ~~continuous~~ continual basis during treatment.

R18-13-1512. Recordkeeping

B. An applicator of bulk biosolids, except ~~composted~~ exceptional quality biosolids, shall collect the following information for each land application site, and, except as indicated in subsection (B)(6) of this Section, shall retain this information for at least 5 years:

R18-13-1513. Reporting

A. A person who prepares biosolids for application shall provide the applicator written notification of the pollutant concentrations, including total nitrogen (as N on a dry-weight basis) in accordance with R18-13-1503(~~B~~ C).

C. A bulk applicator of biosolids other than ~~composts~~ exceptional quality biosolids shall provide the land owner and lessee of land application sites with information on the pollutant concentrations and loading rates of biosolids applied to that site, as well as any applicable site restrictions under R18-13-1508.

D. A bulk applicator of biosolids other than ~~composts~~ exceptional quality biosolids shall report to the Department when 90% or more of any cumulative pollutant loading rate has been used at a site.

E. On February 19 of each year, persons land applying ~~non-composted,~~ bulk biosolids which are not exceptional quality biosolids shall, by letter or on a form provided by the Department, report all of the following applicable information on their activities during the previous calendar year to the Department:

F. On February 19 of each year, a person preparing ~~composted~~ exceptional quality biosolids shall, by letter or on a form provided by the Department, report to the Department all the following applicable information regarding their activities during the previous calendar year:

1. Amount of biosolids received;
2. Amount of ~~composted~~ exceptional quality biosolids produced (tons or kilograms);
3. Amount of ~~composted~~ exceptional quality biosolids distributed;
4. Pollutant concentrations (in milligrams per kilogram of biosolids on a dry-weight basis);
5. Pathogen treatment methodologies used during year; and
6. Vector attraction reduction methodologies used during year.

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 text:
Environmental Regulations and Technology -- Control of Pathogens and Vector Attraction in Sewage Sludge", (EPA-625/R-92/013, 1992, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268, located at R18-13-1509.

13. Whether the rule was previously adopted as an emergency rule and, if so, whether the text was changed between adoption as an emergency and the adoption of these final rules:
Not applicable.

14. The full text of the rule follows:

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 13. DEPARTMENT OF ENVIRONMENTAL QUALITY
SOLID WASTE MANAGEMENT

ARTICLE 15. LAND APPLICATION OF BIOSOLIDS

Section
R18-13-1501. Applicability
R18-13-1502. Definitions
R18-13-1503. General Requirements
R18-13-1504. Applicator Registration, Bulk Biosolids
R18-13-1505. Pollutant Concentrations
R18-13-1506. Pathogen Reduction Requirements
R18-13-1507. Management Practices
R18-13-1508. Site Restrictions
R18-13-1509. Vector Attraction Reduction
R18-13-1510. Transportation
R18-13-1511. Self-monitoring
R18-13-1512. Recordkeeping
R18-13-1513. Reporting
R18-13-1514. Enforcement
Appendix A Procedures to Determine Annual Biosolids Applica-

tion Rates

ARTICLE 15. LAND APPLICATION OF BIOSOLIDS

R18-13-1501. Applicability

A. This Article applies to any person who prepares biosolids for land application, to transporters of biosolids that are to be land-applied, to the applicator of biosolids, and to the land owner and lessee of land to which biosolids have been applied.

B. The land application of biosolids in a manner consistent with this Article is exempt from the requirements of the aquifer protection program, as established by A.R.S. Title 49, Chapter 2, Article 3 and 18 A.A.C. 9, Article 1.

C. Except as otherwise provided in subsection (D) of this Section, the land application of biosolids in a manner that is not consistent with this Article is prohibited.

D. The Department may permit the land application of biosolids in a manner which differs from any of the requirements in R18-13-1507 but is otherwise consistent with this Article under the aquifer protection permit program established by A.R.S. Title 49, Chapter 2, Article 3, and 18 A.A.C. 9, Article 1.

R18-13-1502. Definitions

The terms used in this Article have the following meanings:

1. "Aerobic digestion" means the biochemical decomposition of organic matter in biosolids into carbon dioxide and water by microorganisms in the presence of air.
2. "Agronomic rate" means the whole biosolids application rate on a dry-weight basis which meets both of the following conditions:
   a. The amount of nitrogen needed by existing vegetation or a planned or actual crop has been provided; and
   b. The amount of nitrogen that passes below the root zone of the crop is minimized.
3. "Anaerobic digestion" means the biochemical decomposition of organic matter in biosolids into methane gas and carbon dioxide by microorganisms in the absence of air.
4. "Annual pollutant loading rate" means the maximum amount of a pollutant that can be applied to an acre or hectare of land during a 365-day period.
5. "Annual biosolids application rate" means the maximum amount of biosolids (dry-weight basis) that can be applied to an acre or hectare of land during a 365-day period.
6. "Applicator" means the person who arranges for and controls the site-specific land application of biosolids in Arizona.
7. "Biosolids" means sewage sludge, including exceptional quality biosolids, which is placed on, or applied to the land in order to use the beneficial properties of the material as a soil amendment, conditioner, or fertilizer. Biosolids do not include any of the following:
   a. Sludge determined to be hazardous in accordance with A.R.S. Title 49, Chapter 5, Article 2, and 40 CFR 261.
   b. Sludge with a concentration of polychlorinated biphenyls (PCBs) equal to or greater than 50 milligrams per kilogram of total solids (dry-weight basis).
   c. Grit (e.g., sand, gravel, cinders, or other materials with a high specific gravity) or screenings generated during preliminary treatment of domestic sewage by a treatment works.
   d. Sludge generated during the treatment of either surface water or groundwater used for drinking water.
   e. Sludge generated by an industrial facility during the treatment of industrial wastewater, or industrial wastewater combined with domestic sewage.
   f. Commercial septage, industrial septage, or domestic septage combined with commercial or industrial septage.
   g. Special wastes, as defined and controlled under A.R.S. Title 49, Chapter 4, Article 9.
8. "Bulk biosolids" means biosolids that are transported and land-applied in a manner other than in a bag or other container holding biosolids of 1.102 short tons or 1 metric ton or less.
9. "Business day" means Monday through Friday, between the hours of 8 a.m. and 5 p.m., except for state and federal holidays.
10. "Coarse fragments" means rock particles in the gravel-size range or larger.
11. "Coarse or medium sands" means a soil mixture of which more than 50% of the sand fraction will be retained on a No. 40 (0.425 mm) sieve.
12. "Cumulative pollutant loading rate" means the maximum amount of a pollutant that can ever be applied to a land application site.
13. "CWA" means the Clean Water Act, 33 U.S.C. 1251 *et seq.*, as amended.
14. "Department" means the Arizona Department of Environmental Quality.
15. "Domestic septage" means the liquid or solid material removed from a septic tank, cesspool, portable toilet, marine sanitation device, or similar system or device treating only domestic sewage. Domestic septage does not include commercial or industrial septage, or restaurant grease-trap wastes.
16. "Domestic sewage" means waste or wastewater from humans or household operations that is discharged to publicly or privately owned treatment works. Domestic sewage also includes commercial and industrial wastewaters which are discharged into a publicly-owned or privately-owned treatment works where the industrial or commercial wastewater combines with human excreta and other household wastewaters prior to treatment.
17. "Dry-weight basis" means the weight of biosolids calculated after the material has been dried at 105°C until reaching a constant mass.
18. "Exceptional quality biosolids" means biosolids which meet and have been certified under R18-13-1512 as meeting the pollutant concentrations in R18-13-1505 Table 2, Class A pathogen reduction in R18-13-1506, and 1 of the vector attraction reduction requirements in R18-13-1509, paragraphs (1) through (8).
19. "Feed crops" means crops that are produced for consumption by animals.
20. "Fiber crops" means crops grown for their physical characteristics. Fiber crops are not produced for consumption by humans or animals, and include flax and cotton.
21. "Food crops" means crops which are produced for consumption by humans.
22. "Gravel" means soil predominantly composed of particles of rock that will pass a 3-inch (75 mm) sieve and be retained on a No. 4 (4.75 mm) sieve.
23. "Groundwater" means the water below the land's surface in the saturated zone which is sufficient to yield usable quantities of water to a well or spring.
24. "Industrial wastewater" means wastewater that is generated in a commercial, industrial, or manufacturing process.

25. "Land application" or "apply biosolids" or "biosolids applied to the land" means spreading biosolids on the surface of the land, injecting biosolids below the land's surface, or incorporating biosolids into the soil in order to condition the soil or fertilize crops.
26. "Monthly average" means the arithmetic mean of all measurements taken during a calendar month.
27. "Municipality" means a city, town, county, district, association, or other public body (including an intergovernmental agency of 2 or more of the foregoing entities created by or under state law). The definition includes special districts such as water districts, sewer districts, sanitary districts, utility districts, drainage districts, or similar entities that have as a principal responsibility, the treatment, transport, use, or disposal of biosolids.
28. "Other container" means a bucket, bin, box, carton, trailer, pickup truck bed or tanker vehicle or an open or closed receptacle with a load capacity of 1.102 short tons or 1 metric ton or less.
29. "Pathogen" means a disease-causing organism.
30. "Person" has the meaning set out in A.R.S. § 49-701 and also includes an agent or employee of an organization.
31. "Person who prepares biosolids" means either the person who generates the biosolids during the treatment of domestic sewage in a treatment works, packages the biosolids, or derives a new product from the biosolids either through processing or by combining it with another material, including blending several biosolids together.
32. "pH" means the logarithm of the reciprocal of the hydrogen ion concentration.
33. "Pollutant" means an organic substance, an inorganic substance, a combination of organic and inorganic substances, or a pathogenic organism that, after release into the environment and upon exposure, ingestion, inhalation, or assimilation into an organism, either directly from the environment or indirectly by ingestion through the food chain, could cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformities in either organisms or reproduced offspring.
34. "Pollutant limit" means a numerical value that describes the mass or volume of a pollutant allowed per unit of biosolids; or the mass or volume of a pollutant that can be applied to an acre or hectare of land.
35. "Privately owned treatment works" means a device or system owned by a non-governmental entity used to treat, including recycle and reclaim, either domestic sewage or a combination of domestic sewage and industrial waste which is generated off-site.
36. "Public contact site" means a park, sports field, cemetery, golf course, plant nursery, or other land with a high potential for public exposure to the biosolids.
37. "Publicly owned treatment works" means a device or system owned by either a municipality or a state used to treat, including recycle and reclaim, either domestic sewage or a combination of domestic sewage and industrial waste.
38. "Reclamation" means using biosolids to restore or repair mining or construction sites, landfill caps, or other drastically disturbed land.
39. "Responsible official" means a principal corporate officer, general partner, proprietor, or, in the case of a municipality, a principal executive official, or any duly authorized agent thereof.
40. "Sand" means soil that contains more than 85% grains in the size range that will pass a No. 4 (4.75 mm) sieve and be retained on a No. 200 (0.075 mm) sieve.
41. "Sewage sludge" or "sludge" means solid, semi-solid, or liquid residue generated by publicly-owned or privately-owned treatment works during the treatment of domestic sewage. Sewage sludge includes domestic septage, scum removed in the course of treatment, and any material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge, or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.
42. "Specific oxygen uptake rate (SOUR)" means the mass of oxygen consumed per unit time per unit mass of total solids (dry-weight basis) in the biosolids.
43. "Store or storage of biosolids" means the temporary holding or placement of biosolids on land prior to land application.
44. "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, 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 or foreign commerce;
    d. All impoundments of surface waters;
    e. Tributaries of surface waters; and
    f. Wetlands.
45. "Ton" means a net weight of 2000 pounds, also known as a short ton.
46. "Total solids" means the biosolids residue that remain when the sewage sludge is dried at 103° to 105°C.
47. "Treatment of biosolids" means the thickening, stabilization, dewatering, and other preparation of biosolids for land application. Storage is not treatment of biosolids.
48. "Treatment works" means a federally-owned, publicly-owned, or privately-owned device or system used to treat, including recycle and reclaim, either domestic sewage or a combination of domestic sewage and industrial waste.
49. "Unstabilized solids" means the organic matter in biosolids that has not been treated or reduced through either an aerobic or anaerobic process.
50. "Vectors" means rodents, flies, mosquitos, or other organisms capable of transporting pathogens.
51. "Volatile solids" means the amount of the total solids lost when the biosolids are combusted at 550°C in the presence of excess air.
52. "Wetlands" means those areas that are inundated or saturated by surface water or ground water at a frequency and duration to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

R18-13-1503. General Requirements

A. A person shall not transport or apply biosolids to land in the state of Arizona, except as set forth in this Article.

B. The management practices in R18-13-1507 do not apply when biosolids are exceptional quality biosolids.

C. The applicator shall obtain the necessary information needed to comply with the requirements of this Article.

D. The applicator shall not receive bulk biosolids without written confirmation of the filing of a "Request for Registration" pursuant to R18-13-1504 from the Department.

E. The land owner or lessee of land on which bulk biosolids which are not exceptional quality biosolids have been applied shall notify any subsequent land owner and lessee of all previous land applications of biosolids and shall disclose any of the site restrictions listed in R18-13-1508, which are still in effect at the time the property is transferred.

R18-13-1504. Applicator Registration, Bulk Biosolids

A. Any person intending to land-apply bulk biosolids in Arizona shall submit, on a form provided by the Department, a completed "Request for Registration". Any current applicator shall submit this request by June 15, 1996.

B. An applicator shall not engage in land application of bulk biosolids after July 15, 1996, unless the applicator has obtained a written acknowledgment of the request for registration from the Department.

C. The request for registration for all biosolids except exceptional quality biosolids shall include the following information. The request for registration for exceptional quality biosolids shall include information in paragraphs (1) through (4).

1. The name, address, and telephone number of the applicator and any agents of the applicator.
2. The name and telephone number of a primary contact person who has specific knowledge of the land application activities of the applicator.
3. Whether the applicator holds a National Pollutant Discharge Elimination System (NPDES) permit, or state equivalent and, if so, the permit number.
4. The identity of the person or persons who will prepare the biosolids for land application, if different from the applicator.
5. Unless the information is already on file at the Department as part of an approved land-application plan, for each site on which land application is anticipated to take place, the following information:
   a. The name, mailing address, and telephone number of the land owner and lessee, if any;
   b. The physical location of the site by county; and legal description, including township, range, and Section; or latitude and longitude at the center of the parcel;
   c. The number of acres or hectares at each site on which biosolids are planned to be land-applied;
   d. Except for sites described by R18-13-1505(D)(3), background concentrations of the pollutant parameters listed in Table 4 of R18-13-1505 from representative soil samples; and
   e. The location of any portion of the site having a slope greater than 6%.
   f. For sites on which biosolids have not been applied as of the effective date of this Article, proof of public notice of the potential use of the site for land application of biosolids by the placement of a notice in the largest newspaper in general circulation in the area in which the site is located. In order to satisfy this requirement, the notice shall appear at least once per week for at least 2 consecutive weeks. In the event a site is not used for land application for a period of 3 consecutive years or more, the applicator shall renoticed the site prior to its use.

D. A responsible official of the applicator shall sign the request for registration.

E. The Department shall mail a written acknowledgment of requests for registration, including supplemental requests, within 15 business days of receipt of the request.

F. An applicator wishing to use a site which has not been identified in a request for registration shall file a supplemental request with the Department prior to using the new site.

R18-13-1505. Pollutant Concentrations

A. A person shall not apply biosolids with pollutant concentrations which exceed any of the instantaneous pollutant concentrations set forth in Table 1 of this Section. Biosolids placed on public contact sites with a low potential for child occupancy are exempt from the selenium limit in Table 1.

B. A person shall not apply exceptional quality biosolids that exceed any of the monthly average pollutant concentrations set out in Table 2 of this Section.

C. A person shall not apply bulk biosolids which are not exceptional quality biosolids to a site on which the annual pollutant loading rates in Table 3 of this Section will be exceeded. Annual application rates shall be determined using the methodology set out in Appendix A.

D. A person shall not apply bulk biosolids which are not exceptional quality biosolids to a site where any of the cumulative pollutant loading rates in Table 4 of this Section will be exceeded. Compliance with the cumulative pollutant rates shall be determined using the following:

1. Cumulative pollutant rates shall be calculated using all known biosolids applications to a site since September 13, 1979.
2. An applicator shall calculate the existing cumulative level of the pollutants set out in Table 4 using either actual analytical data from the application events, or background concentrations determined by taking representative soil samples of the site, when it is known that the site received biosolids before April 1996.
3. For those sites which have not received biosolids prior to the effective date of this rule, background soil tests need not be conducted.
4. Biosolids placed on public contact sites with a low potential for child-occupancy are exempt from the selenium limit in Table 4.

Table 1. Ceiling Pollutant Concentrations

Pollutant	Concentrations (milligrams per kilogram) {1}
Arsenic	75.0
Cadmium	85.0
Chromium	3000.0
Copper	4300.0
Lead	840.0
Mercury	57.0
Molybdenum	75.0
Nickel	420.0
Selenium	100.0
Zinc	7500.0

{1} Dry-weight basis.

Table 2.Monthly Average Pollutant Concentrations

Pollutant	Concentrations (milligrams per kilogram) {1}
Arsenic	41.0
Cadmium	39.0
Copper	1500.0
Lead	300.0
Mercury	17.0
Nickel	420.0
Selenium	100.0
Zinc	2800.0

{1} Dry-weight basis.

Table 3.Annual Pollutant Loading Rates

Pollutant	Loading rate (in kilograms per hectare) {1}
Arsenic	2.0
Cadmium	1.9
Copper	75.0
Lead	15.0
Mercury	0.85
Nickel	21.0
Selenium	5.0
Zinc	140.0

{1} Dry-weight basis.

Table 4.Cumulative Pollutant Loading Rates

Pollutant	Loading rates (in kilograms per hectare) {1}
Arsenic	41.0
Cadmium	39.0
Copper	1500.0
Lead	300.0
Mercury	17.0
Nickel	420.0
Selenium	100.0
Zinc	2800.0

{1} Dry-weight basis.

R18-13-1506. Pathogen Reduction Requirements

A. An applicator shall ensure that all biosolids applied to land meet either Class A or Class B pathogen reduction as described in this Section, at the time the biosolids are land applied.

B. Biosolids which are sold or given away in a bag or other container, or which are to be applied on a lawn or home garden, shall meet the Class A requirements set out in subsection (D) of this Section.

C. Land on which biosolids with Class B pathogen reduction have been applied is subject to the use restrictions set out in R18-13-1508.

D. Biosolids satisfy the Class A pathogen reduction when the density of either fecal coliform is less than 1000 Most Probable Number per gram of total solids (dry-weight basis), or the density of *Salmonella sp.* bacteria is less than 3 Most Probable Number per 4 grams of total solids (dry-weight basis); and any 1 of the following 11 alternative pathogen treatment options is used:

1. Alternative 1 -- The pathogen treatment process meets 1 of the following time and temperature requirements:
   a. When the percent solids are 7% or greater, the temperature of the biosolids shall be held at 50°C for at least 20 minutes; except when the biosolids are heat-treated by either warmed gases or an immiscible liquid, in which case the requirements of subsection (D)(1)(b) of this Section shall be met.
   b. When the percent solids are 7% or greater, and the biosolids are heat-treated by either warmed gases or an immiscible liquid, a temperature of 50°C shall be held for at least 15 seconds; in the event a higher temperature is held, the exact time period may be calculated using the following equation:

$$D = \frac{131{,}700{,}000}{10^{[0.1400t]}}$$

   Where:D = time in days, and
   t = temperature in degrees Celsius.
   c. When the percent solids are less than 7%, the temperature of the biosolids shall be held at 50°C for at least 30 minutes. In the event a higher temperature is held, the exact time period may be calculated using the following equation:

$$D = \frac{50{,}070{,}000}{10^{[0.1400t]}}$$

   Where:D = time in days, and
   t = temperature in degrees Celsius.
   d. When the percent solids are less than 7%, and the time of heating is at least 15 seconds, but less than 30 minutes, the exact time and temperature to be maintained is calculated using the following equation:

$$D = \frac{131{,}700{,}000}{10^{[0.1400t]}}$$

   Where:D = time in days, and
   t = temperature in degrees Celsius.
2. Alternative 2 -- The pathogen treatment process meets all the following parameters:
   a. The pH of the biosolids is raised to 12 or higher and held above 12 for at least 72 hours;
   b. During the period that the pH is above 12, the temperature of the biosolids is held above 52°C for at least 12 hours; and
   c. At the end of the 72-hour period, the biosolids are air dried to achieve a percent solids of more than 50%.
3. Alternative 3 -- The results of the pathogen treatment meet all of the following:

a. The biosolids have a enteric virus density of less than 1 plaque-forming unit per 4 grams of total solids (dry-weight basis); and
b. The biosolids have a viable helminth ova density of less than 1 per 4 grams of total solids (dry-weight basis).
c. Once the density requirements in paragraphs (a) and (b) are consistently met, and the values and ranges of the pathogen treatment process used are documented, future compliance may be shown by reporting those values and ranges rather than by measuring virus and helminth ova densities.

4. Alternative 4 -- Composting shall use either of the following:
a. Using either the within-vessel or the static-aerated-pile composting methods, the temperature of the biosolids is maintained at 55°C or higher for 3 days.
b. Using the windrow composting method, the temperature of the biosolids is maintained at 55°C or higher for 15 days or longer. During the period when the compost is maintained at 55°C or higher, there shall be a minimum of 5 turnings of the windrow.

5. Alternative 5 -- Heat drying. The biosolids are dried by contact with hot gases to reduce the moisture content to 10% or lower. During the process, either 1 of the following shall be met:
a. The temperature of the sewage sludge particles exceeds 80°C; or
b. The wet bulb temperature of the gas as the biosolids leave the dryer exceeds 80°C.

6. Alternative 6 -- Heat treatment. Liquid biosolids are heated to a temperature of 180°C or higher for at least 30 minutes.

7. Alternative 7 -- Thermophilic aerobic digestion. Liquid biosolids are agitated with air or oxygen to maintain aerobic conditions, and the mean cell residence time of the biosolids is 10 days at 55° to 60°C.

8. Alternative 8 -- Beta ray irradiation. Biosolids are irradiated with beta rays from an accelerator at dosages of at least 1.0 mega rad at room temperature (approximately 20°C).

9. Alternative 9 -- Gamma ray irradiation. Biosolids are irradiated with gamma rays from certain isotopes, such as Cobalt 60 and Cesium 137, at room temperature (approximately 20°C).

10. Alternative 10 -- Pasteurization. The temperature of the biosolids is maintained at 70°C or higher for at least 30 minutes.

11. Alternative 11 -- Other processes determined by the EPA Pathogen Equivalency Committee to meet Processes to Further Reduce Pathogens may be authorized by the Director.

E. Biosolids satisfy the Class B pathogen reduction when it meets any 1 of the following 7 options:

1. Alternative 1 -- The geometric mean of the density of fecal coliform in 7 samples shall be less than either 2,000,000 Most Probable Number per gram of total solids (dry-weight basis), or 2,000,000 colony forming units per gram of total solids (dry-weight basis).

2. Alternative 2 -- Air drying. The biosolids are dried on sand beds or basins for a minimum of 3 months. During at least 2 of the 3 months, the average daily ambient temperature shall be above 0°C;

3. Alternative 3 -- Lime stabilization. Sufficient lime is added to raise the pH of the biosolids to 12 for at least 2 hours;

4. Alternative 4 -- Aerobic digestion. The biosolids are agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 40 days at 20°C and 60 days at 15°C;

5. Alternative 5 -- Anaerobic digestion. The biosolids are treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35° to 55°C and 60 days at 20°C; or

6. Alternative 6 -- Composting. Using either the within-vessel, static-aerated-pile or windrow composting methods, the temperature of the biosolids is raised to 40°C or higher for 5 consecutive days. For at least 4 hours during the 5 days, the temperature in the compost pile shall exceed 55°C.

7. Alternative 7 -- Other processes determined by the EPA Pathogen Equivalency Committee to meet Processes to Significantly Reduce Pathogens may be authorized by the Director.

R18-13-1507. Management Practices

A. An applicator of bulk biosolids which are not exceptional quality biosolids shall comply with the following management practices at each land application site:

1. Biosolids shall not be applied to soil with a pH of less than 6.5 at the time of the sludge application, unless the biosolids are either treated pursuant to 1 of the following procedures R18-13-1506(D)(2), R18-13-1506(E)(3), or R18-13-1509(A)(6); or the soil and biosolids mixture has a pH of 6.5 or higher immediately after land application.

2. Biosolids shall not be applied to land with slopes greater than 6%, unless the site is operating pursuant to an applicable permit issued pursuant to the CWA.

3. Biosolids shall not be applied to land under the following conditions:
a. Biosolids with Class A pathogen reduction shall not be applied to land where the depth to groundwater is 5 feet (1.52 meters) or less.
b. Biosolids with Class B pathogen reduction shall not be applied to land where the depth to groundwater is 10 feet (3.04 meters) or less.
c. Biosolids with Class B pathogen reduction shall not be applied to gravel, coarse or medium sands, and sands with >15% coarse fragments where the depth to groundwater is 40 feet (12.2 meters) or less from the point of application of biosolids.

4. Biosolids shall not be applied to land that is 32.8 feet (10 meters) or less from surface water so that the biosolids enter the surface water or leach substances in concentrations that exceed water quality standards.

5. Biosolids shall not be stored or applied closer than 1000 feet (305 meters) from a public or semi-public drinking water supply well, and no closer than 250 feet (76.2 meters) from any other water well.

6. Biosolids shall not be stored or applied within 25 feet (7.62 meters) of a public right-of-way or private property line unless the applicator receives permission to apply biosolids from the land owner or lessee of the adjoining property.

7. Biosolids shall not be applied at an application rate that is greater than the agronomic rate of the vegetation or crop grown on the site, except in the case of a reclamation site which may not exceed the agronomic rate averaged over a 5 year period.

8. Domestic septage, and any other biosolids with less than

10% solids, shall not be applied at a rate which exceeds the annual application rate which is calculated, in gallons per acre per 365-day period, by dividing the amount of nitrogen needed by the crop or vegetation grown on the land, in pounds per acre per 365-day period, by 0.0026.

9. Bulk biosolids shall not be applied to land that is flooded, frozen, or snow-covered, so that the bulk biosolids enter a wetland or other surface water, except as provided in a permit issued pursuant to Section 402 or 404 of the CWA or an equivalent state permit.
10. Once a site has received biosolids containing nitrogen at the equivalent of the agronomic rate appropriate for that site, a crop must be grown on the site prior to any additional biosolids application.
11. Irrigation of an application site shall not exceed the needs of the crop.
12. To minimize odors, biosolids applied within 1,000 feet (305 meters) of a dwelling shall be injected or incorporated into the soil within 10 hours of being applied.

B. When biosolids are to be placed in a bag or other container, the person who prepares the biosolids shall distribute a label or information sheet to persons receiving the material. This label or information sheet shall contain at least the following information:

1. The identity of the person who prepared the biosolids;
2. Instructions on the proper use of the material, including agronomic rates, and an annual application rate which ensures that the annual pollutant rates set out in R18-13-1505 will not be exceeded; and
3. A statement that application of the biosolids to the land is prohibited to exceed application rates described in the instructions on the label or information sheet.

R18-13-1508. Site Restrictions

A. The following site restrictions shall apply to land where biosolids, which do not meet the Class A pathogen reduction requirements set out in R18-13-1506, have been land-applied:

1. Food crops with harvested parts that touch the biosolids, or biosolids and soil mixture, but otherwise grow above the land's surface shall not be harvested for 14 months following application.
2. When the biosolids remain on the land's surface for 4 months or more, food crops with harvested parts growing in or below the land's surface shall not be harvested for 20 months following application.
3. When the biosolids remain on the land's surface for less than 4 months prior to incorporation, food crops with harvested parts growing in or below the land's surface shall not be harvested for 38 months following application.
4. Food, feed, and fiber crops shall not be harvested for 30 days after application.
5. Animals shall not be allowed to graze on the land for 30 days after application.
6. Public access to public contact sites shall be restricted for 1 year after application.
7. Public access to land with a low potential for public exposure shall be restricted for 30 days after application.
8. Turf to be used at a public contact site or private residence shall not be harvested for 1 year from application.

B. Once application is completed at a site, the applicator shall, in writing, provide the land owner and lessee with the following information:

1. The cumulative pollutant loading at the site when it is greater than or equal to 90% of the site's available capacity according to Table 4 of R18-13-1505;
2. Any of the restrictions set forth in this Section that apply to the property, and if so, the applicator shall state the nature of such restrictions; and
3. A responsible official of the applicator shall sign this document and include the following statement:

"I certify under penalty of law, that the information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are substantial penalties for false representations, including fines and imprisonment."

C. The land owner or lessee shall provide each applicator with a signature indicating receipt of the site restriction statement.

R18-13-1509. Vector Attraction Reduction

A. Except as provided in subsection (B), an applicator or person who prepares biosolids shall use 1 of the following vector attraction reduction procedures when biosolids are land-applied:

1. Reducing the mass of volatile solids by a minimum of 38% using the calculation procedures set out in "Environmental Regulations and Technology -- Control of Pathogens and Vector Attraction in Sewage Sludge", (EPA-625/R-92/013, 1992, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268) incorporated by reference, and no further editions, and on file with the Department and the Office of the Secretary of State.
2. For an anaerobically digested biosolid, by anaerobically re-digesting a portion of the previously digested material in a laboratory bench-scale unit for 40 additional days at a temperature between 30 and 37°C. Vector attraction reduction is achieved where the volatile solids in the material at the beginning of the period are further reduced by less than 17%.
3. For an aerobically digested biosolids, by aerobically re-digesting a portion of the previously digested material (which has a percent solids of 2% or less), in a laboratory bench-scale unit for an additional 30 days at 20°C. Vector attraction reduction is achieved where the volatile solids in the material at the beginning of the period are further reduced by less than 15%.
4. Subjecting the biosolids to an aerobic process during which the specific oxygen uptake rate (SOUR) is equal to or less than 1.5 milligrams of oxygen per hour per gram of total solids (dry-weight basis) at a temperature of 20°C.
5. Subjecting the biosolids to an aerobic process for 14 days or longer, during which, the temperature of the biosolids shall be higher than 40°C and the average temperature of the biosolids shall be higher than 45°C.
6. Raising the pH of the biosolids to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 2 hours and then at 11.5 or higher for an additional 22 hours.
7. The percent solids of the biosolids that does not contain unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 75% based on the moisture content and total solids prior to mixing with other materials.
8. The percent solids of the biosolids containing unstabilized solids generated in a primary wastewater treatment process shall be equal to or greater than 90% based on the moisture content and total solids prior to mixing with other materials.
9. Injecting the biosolids below the surface of the land such that no significant amount of biosolids is present on the land surface 1 hour after injection. When the biosolids meet Class A pathogen reduction, injection shall occur within 8 hours after being discharged from a Class A pathogen treatment process.

10. Incorporating the biosolids into the soil within 6 hours after application. When the biosolids meet Class A pathogen reduction, application shall occur within 8 hours after being discharged from a Class A pathogen treatment process.

B. Biosolids that are sold or given away in a bag or other container, or are applied to a lawn or home garden, shall meet 1 of the vector attraction reduction alternatives set out in subsections (A)(1) through (8).

C. For domestic septage, vector attraction reduction shall be met by 1 of the following 3 methods:
1. By injecting in accordance with subsection (A)(9);
2. By incorporating in accordance with subsection (A)(10); or
3. By raising the pH of the biosolids to 12 or higher through the addition of alkali and, without the addition of more alkali, holding the pH at 12 or higher for at least 30 minutes.

R18-13-1510. Transportation

A. A transporter of bulk biosolids into and within Arizona shall use trucks, trailers, rail-cars, or other vehicles which are covered to prevent blowing of materials and are leakproof.

B. A transporter of bulk biosolids into and within Arizona shall comply with the requirements found in R18-8-510 or R18-8-612.

C. A transporter of biosolids shall periodically clean any trucks, trailers, rail-cars, or other vehicles used to transport biosolids to prevent odors or insect breeding. A transporter shall clean all tank vehicles used to transport commercial or industrial septage, or restaurant grease-trap wastes, which are also to be used to haul domestic septage, before loading the domestic septage to ensure that mixing of wastes does not occur.

D. In the event bulk biosolids are spilled while being transported, the transporter shall undertake the following activities:
1. The transporter shall immediately pick up any spillage, including any visibly discolored soil, unless otherwise determined by the Department on a case-by-case basis.
2. Within 24 hours of the spill, the transporter shall notify the Department of the spill, and shall submit written notification within 7 days. This written notification shall include the location of the spill, the reason it occurred, the amount of biosolids spilled, and the steps taken to clean up the spill.

R18-13-1511. Self-monitoring

A. Except as provided in subsection (B) of this Section, the frequency of self-monitoring for the pollutants listed in R18-13-1505, the pathogen reduction in R18-13-1506, and the vector attraction reduction requirements in R18-13-1509 shall be as indicated in Table 5.

Table 5. -- Frequency of Self-monitoring

Amount of biosolids applied (tons/metric tons per 365-day period) {1}	Frequency
Greater than zero but less than 319.6/290	Once per year
Equal to or greater than 319.6/290 but less than 1,653/1,500	Once per quarter (4 times per year)
Equal to or greater than 1,653/1,500 but less than 16,530/15,000	Once per 60 days (6 times per year)
Equal to or greater than 16,530/15,000	Once per month (12 times per year)

{1} The amount of biosolids land-applied in a calendar year (dry-weight basis).

B. In the case of biosolids that have been stockpiled or lagooned, the pathogen and vector attraction reduction monitoring need only be performed once prior to land application. Sampling shall be conducted in a manner which is representative of the entire stockpile or lagoon.

C. All additional, more frequent biosolids samples collected and analyzed during the reporting period shall be submitted to the Department along with the regularly-scheduled data required by subsection (A) of this Section.

D. As needed, the Department may order the person who prepares or the applicator to collect and analyze additional samples to measure pollutants of potential concern other than those set out in Table 1 of R18-13-1505.

E. Samples collected for analysis shall be obtained in a manner which does not compromise the integrity of the sample quality, and shall be representative of the quality of the biosolids being land-applied during the reporting period.

F. Biosolids samples shall be tracked using chain of custody procedures that document the persons in control of the sample from the time it was collected through the time of analysis.

G. Biosolids samples shall be analyzed in accordance with the analytical methods set out in 40 CFR 503.8, or A.A.C. R9-14-609 or R9-14-610. Analyses shall be performed at a laboratory operating in compliance with A.R.S. § 36-495 *et seq.*

H. Monitoring that can be performed in a continual manner for pathogen and vector attraction reduction treatment operating parameters, such as time and temperature, shall be monitored on a continual basis during treatment.

I. Monitoring for the management practices set out in R18-13-1507 shall be conducted and recorded for each site.

J. Records of all compliance measurements, including the analysis of pollutant concentrations, shall be kept in accordance with R18-13-1512, and shall be reported to the Department in accordance with R18-13-1513.

R18-13-1512. Recordkeeping

A. A person who prepares biosolids shall collect and retain the following information for at least 5 years:
1. The date, time, and method used for each sampling activity and the identity of the person or persons collecting the sample;
2. The date, time, and method used for each sample analysis and the identity of the person or persons conducting the analysis;
3. The results of all analyses of pollutants regulated under R18-13-1505;
4. The results of all pathogen density analyses, and applicable descriptions of the methods used for pathogen treatment pursuant to R18-13-1506;
5. Descriptions of the methods used, if any, and the operating values and ranges observed in any pre-land application, vector attraction reduction activities required by R18-13-1509(A); and
6. The records described in subsections (A)(1)-(5) of this Section, shall be accompanied by the following certifica-

tion statement signed by a responsible official of the person who prepares the biosolids:

"I certify, under penalty of law, that the pollutant analyses, and the description of pathogen treatment and vector attraction reduction activities, have been made under my direction and supervision and in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine whether the applicable biosolids requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

B. An applicator of bulk biosolids, except exceptional quality biosolids, shall collect the following information for each land application site, and, except as indicated in subsection (B)(6) of this Section, shall retain this information for at least 5 years:
1. The location, by either street address or latitude and longitude, of each site;
2. The number of acres or hectares in each site;
3. The date and time the biosolids were applied to each site;
4. The amount of biosolids (in dry metric tons) applied to each site;
5. The biosolids loading rates (in tons or kilograms of biosolids per acre or hectare);
6. The cumulative pollutant levels of each regulated pollutant (in tons or kilograms per acre or hectare). These records shall be retained permanently;
7. The results of all pathogen density analyses, and applicable descriptions of the methods used for pathogen treatment pursuant to R18-13-1506;
8. A description of the activities and measures used to ensure compliance with the management practices required by Section R18-13-1507;
9. If vector attraction reduction was not met by the person who prepares the biosolids, a description of the vector attraction reduction activities used by the applicator to ensure compliance with the requirements of R18-13-1509;
10. A description of any applicable site restrictions imposed by R18-13-1508, where biosolids with Class B pathogen reduction have been applied and documentation that the applicator has notified the land owner and lessee of these restrictions;
11. The records described in subSections (B)(1)-(8) of this Section, shall be accompanied by the following certification statement signed by a responsible official of the applicator of the biosolids:

"I certify, under penalty of law, that the information and descriptions contained herein, have been made under my direction and supervision and in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine whether the applicable biosolids requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

12. Information in subsections (A)(1) through (6) when the person who prepares the biosolids is not located in this state.

C. All records required to be retained pursuant to this Section shall be subject to periodic inspection and copying by the Department.

D. In the event of unresolved litigation, including enforcement, concerning the activities documented by the records required by this Section, the period of record retention shall be extended pending final resolution of the litigation.

R18-13-1513. Reporting

A. A person who prepares biosolids for application shall provide the applicator written notification of the pollutant concentrations, including total nitrogen (as N on a dry-weight basis) in accordance with R18-13-1503(C).

B. A transporter shall report spills to the Department in accordance with R18-13-1510(C).

C. A bulk applicator of biosolids other than exceptional quality biosolids shall provide the land owner and lessee of land application sites with information on the pollutant concentrations and loading rates of biosolids applied to that site, as well as any applicable site restrictions under R18-13-1508.

D. A bulk applicator of biosolids other than exceptional quality biosolids shall report to the Department when 90% or more of any cumulative pollutant loading rate has been used at a site.

E. On February 19 of each year, persons land applying bulk biosolids which are not exceptional quality biosolids shall, by letter or on a form provided by the Department, report all of the following applicable information on their activities during the previous calendar year to the Department:
1. Actual sites used; and
2. For each site used, the following information:
   a. Amount of biosolids applied (in tons or kilograms per acre or hectare);
   b. Application loading rates (in a tons or kilograms per acre or hectare);
   c. Pollutant concentrations (in milligrams per kilogram of biosolids on a dry weight basis);
   d. Pathogen treatment methodologies used during year; and
   e. Vector attraction reduction methodologies used during year.

F. On February 19 of each year, a person preparing exceptional quality biosolids shall, by letter or on a form provided by the Department, report to the Department all the following applicable information regarding their activities during the previous calendar year:
1. Amount of biosolids received;
2. Amount of exceptional quality biosolids produced (tons or kilograms);
3. Amount of exceptional quality biosolids distributed;
4. Pollutant concentrations (in milligrams per kilogram of biosolids on a dry-weight basis);
5. Pathogen treatment methodologies used during year; and
6. Vector attraction reduction methodologies used during year.

G. All annual self-monitoring reports shall contain following certification statement signed by a responsible official:

"I certify, under penalty of law, that the information and descriptions herein, have been made under my direction and supervision and in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information used to determine whether the applicable biosolids requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

R18-13-1514. Enforcement

A. A person subject to this Article shall allow, during reasonable times, a representative of the Department to enter property subject to this Article, to:
1. Inspect all biosolids pathogen and vector treatment facilities, transportation vehicles, and land application sites to

determine compliance with this Article;

2. Inspect and copy records prepared in accordance with this Article;

3. Sample biosolids quality.

B. Any person violating this Article shall take all reasonable steps to minimize any adverse consequences to human health or the environment without the Department ordering such activities.

C. A person who violates the requirements of this Article is subject to compliance and abatement orders issued by the Department; and injunctive and other appropriate relief sought by the Attorney General.

D. Any person who violates any requirement of this Article is subject to a civil penalty of not more than $1,000 per day for each separate violation.

E. In the event of continuing violations, the maximum civil penalty for any 1 violation shall be capped at $15,000 per proceeding.

F. A person who knowingly or negligently violates any requirement of this Article is guilty of a Class 2 misdemeanor and may be imprisoned for up to 45 months per violation.

Appendix A
Procedures to Determine Annual Biosolids Application Rates

This appendix contains the procedure used to determine the annual biosolids application rate (ABAR) which ensures that the annual pollutant loading rates in Table 3 of R18-13-1505 shall not be exceeded.

A. The relationship between the annual pollutant loading rate (APLR) for a pollutant and the ABAR is shown in the following Equation (1).

$$APLR = C \times ABAR \times 0.001 \quad \text{Equation (1)}$$

Where:

APLR = Annual pollutant loading rate in kilograms of biosolids, per hectare, per 365-day period;

C = Pollutant concentration in milligrams, per kilogram of total solids (dry-weight basis);

ABAR = Annual biosolids application rate in metric tons per hectare per 365-day period (dry-weight basis); and

0.001 = A conversion factor.

metric ton = 1.102 short tons

hectare = 2.471 acres

B. The ABAR is calculated using the following procedure:

1. Analyze a biosolids sample to determine a concentration for each of the pollutants listed in Table 3 of R18-13-1505.

2. Using each of the pollutant concentrations from Step 1 and the APLRs from Table 3 of R18-13-1505, calculate a separate ABAR for each pollutant using the following Equation (2):

$$ABAR = \frac{APLR}{C \times 0.001} \quad \text{Equation (2)}$$

3. The ABAR for the biosolid is the lowest value calculated in Step 2 for any pollutant.