

## 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* first as proposed rules and have been through the formal rulemaking process including approval by the Governor's Regulatory Review Council or the Attorney General. The Secretary of State shall publish the notice along with the Preamble and the full text in the next available issue of the *Register* after the final rules have been submitted for filing and publication.

### NOTICE OF FINAL RULEMAKING

#### TITLE 3. AGRICULTURE

#### CHAPTER 2. DEPARTMENT OF AGRICULTURE ANIMAL SERVICES DIVISION

#### PREAMBLE

- 1. Sections Affected**  
R3-2-206
- Rulemaking Action**  
Amend
- 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. §§ 3-107(A)(1) and 3-1203(A) and (B)  
Implementing statutes: A.R.S. §§ 3-2046 and 3-2081
- 3. The effective date of the rules:**  
July 10, 2002
- 4. A list of all previous notices appearing in the Register addressing the final rule:**  
Notice of Rulemaking Docket Opening: 7 A.A.R. 4360, October 5, 2001  
Notice of Proposed Rulemaking: 7 A.A.R. 4782, October 19, 2001  
Notice of Public Information: 7 A.A.R. 5030, October 26, 2001  
Notice of Supplemental Proposed Rulemaking: 7 A.A.R. 5242, November 23, 2001  
Notice of Public Hearing on Proposed Rulemaking: 7 A.A.R. 5492, December 14, 2001
- 5. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:**  
Name: Sherry D. Blatner, Rules Specialist  
Address: Arizona Department of Agriculture  
1688 W. Adams, Room 235  
Phoenix, AZ 85007  
Telephone: (602) 542-0962  
Fax: (602) 542-5420  
E-mail: sherry.blatner@agric.state.az.us
- 6. An explanation of the rule, including the agency's reasons for initiating the rule:**  
This rulemaking conforms the Department's rules regarding disposal of dead animals with rules promulgated by the Department of Environmental Quality, provides additional safeguards for health issues related to dead animals, and clarifies existing language.
- 7. A reference to any study that the agency relied on in its evaluation of or justification for the proposed rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:**  
None
- 8. 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

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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

A. *The Arizona Department of Agriculture*

The Department will incur modest expenses related to training staff and educating the regulated community on the amendments.

B. *Political Subdivision*

Implementation of this rulemaking will increase the number of animal carcasses disposed of at regulated sanitary landfills, some of which are municipally owned. However, the Department of Environmental Quality rules already permit the disposal of large animals at these landfills. Fees, determined by weight or load, are collected by the landfills for refuse buried at their facilities.

C. *Businesses Directly Affected by the Rulemaking*

Businesses licensed to transport animal carcasses will be permitted to dispose of the carcasses at the following additional locations:

- A veterinarian's clinic,
- Sanitary landfills regulated by the Arizona Department of Environmental Quality (ADEQ),
- An out-of-state landfill regulated by that state's landfill regulatory authority, and
- A landfill located on a Native American reservation that is regulated by equivalent standards to those prescribed by the ADEQ.

However, animals that die from anthrax or a foreign animal disease may only be disposed of as directed by the State Veterinarian.

Wholesale food manufacturers that generate animal bone, animal fat, and animal offal may now discard the material at either a licensed rendering plant or a landfill as described above.

Livestock and poultry producers in the state will have an economically viable alternative to use of the one renderer operating in the state. The renderer may see a drop in business as animal producers and transporters decide on the most economical method of disposal for the refuse they transport. Competition will be reintroduced into this area of business. It is possible that Baker Commodities, the only rendering business in the state that is available to the public for disposal of carcasses or by-product, will note a decrease in customers willing to pay the rendering fee to dispose of dead stock. Baker, however, is a multi-state and international concern.

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

*Between the Proposed Rule and the Supplemental Proposed Rule:*

Subsection (A)(3) of the Notice Supplemental Proposed Rulemaking establishes a denaturing requirement for a carcass with the hide, hair, or pelt still on the carcass if it was from an official state or federal slaughter establishment. This requirement was not fully stated in the Notice of Proposed Rulemaking. The new language prescribes the explicit denaturing requirement.

*Between the Supplemental Proposed Rule and the Final Rule:*

At (A)(2)(b), a veterinarian's clinic is added to the locations to which a carcass may be transported.

At (A)(2)(d), the Department changed language from a "registered" landfill to a "regulated" landfill at the request of the ADEQ.

Subsections (A)(2)(e) and (f) were added to permit disposal of carcasses at regulated out-of-state and Native American landfills.

Subsection (F)(2) was modified to also permit disposal of animal bone, animal fat, and animal offal, generated by wholesale food manufacturers, at regulated out-of-state and native American landfills.

Minor technical and grammatical changes were made in response to suggestions from Council staff.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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

| PUBLIC COMMENT  | Arizona Department of Agriculture (ada) RESPONSE  |
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| <p><b>Mira Leslie, DVH, MPH, State Public Health Veterinarian</b>, Arizona Department of Health Services, Bureau of Epidemiology and Disease Control Services, Office of Infectious Disease Services, writes:<br/> <b>“Upon review of the amendment to the Arizona Administrative Code R3-2-206 being proposed by the Department of Agriculture, the Arizona Department of Health Services, Bureau of Epidemiology and Disease Control Services has no objections or concerns regarding any potential impact of the amendment on the public’s health.”</b> [emphasis added]</p>   | <p>The ADA agrees and thanks the State Public Health Veterinarian for the support of the Arizona Department of Health Services, Bureau of Epidemiology and Disease Control Services.</p>  |
| <p><b>The Arizona Cattle Feeder’s Association</b> writes in support of the rule change:<br/>           “The rule as proposed will help to provide equal access for all cattle producers to properly dispose of deceased animals at either registered sanitary landfills or by utilizing the services of a licensed rendering or tallow plant. Given the vast land area in Arizona and the fact that there is only one rendering plant, located in Maricopa County, it is imperative that this rule change go into effect and facilitate the safe handling and disposition of animal products across all of Arizona. In many areas of the state the only viable service for disposal is at sanitary landfills. Furthermore, by codifying this rule we will have consistent application of rules regarding animal products by the Arizona Department of Environmental Quality and the Arizona Department of Agriculture.”</p> | <p>The ADA agrees and thanks the Arizona Cattle Feeder’s Association for its support.</p>   |
| <p><b>The Arizona Farm Bureau Federation</b> writes in support of the rule change:<br/>           “There is no evidence of carcasses in landfills causing a hazard to the health of the general public. We agree with the Department of Agriculture that the State Veterinarian should handle quarantined dead animals because they will have the best available information to handle such cases.<br/>           “Therefore, the Arizona Farm Bureau Federation would seek to have the Department of Ag change its policy on prohibiting the disposal of animals at landfills.”</p>  | <p>The ADA agrees and thanks the Arizona Farm Bureau Federation for its support.<br/>           A new subsection was added to this proposed rule to restate the existing ADA position regarding movement of certain diseased animals:<br/> <b>“E. Dead animals diagnosed with anthrax or an animal disease foreign to the United States shall be handled as directed by the State Veterinarian.”</b> [emphasis added]</p> |
| <p><b>The United Dairymen of Arizona</b> writes in support of the rule change:<br/>           “Given the high priority status we place on animal health, we feel it is proper for the Department to propose this change which will assist us in maintaining a functioning herd health program. We believe it is imperative that the proposed options for disposal be implemented to help us protect our facilities.”</p>  | <p>The ADA agrees and thanks the United Dairymen of Arizona for its support.</p>  |
| <p><b>D. Brett Benedict, Benedict Feeding Co., Casa Grande, AZ</b>, writes:<br/>           “I am writing in support of the rule change....This provides options in protecting our animal health programs in a practical and effective manner. The shrinking alternatives for this disposal are a hazard to the health of our animals.”</p>  | <p>The ADA agrees and thanks Benedict Feeding Co. for its support.</p>  |
| <p><b>Northside Hay Company, Inc.</b> writes:<br/>           “These proposed rule changes will provide for the proper and safe disposition of animal products in our state.”</p>  | <p>The ADA agrees and thanks Northside Hay Company, Inc., for its support.</p>  |

**Notices of Final Rulemaking**

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| <p><b>Charles L. Chester, Partner, Ryley Carlock &amp; Applewhite, representing Baker Commodities</b>, writes regarding the ADA's legal authority:</p> <p>“In November, 2001, I was retained by Baker....In December, 2001, four attorneys in my office were advised that the proposed amendments were required because the Department did not have authority to restrict use of landfills. ...</p> <p>“When I turned to history to gain knowledge of this stated lack of authority, I found nothing. Rather, for over 20 years, the ADEQ and the Department have maintained the same co-existent regulatory scheme for disposition of dead livestock.”</p>   | <p>The ADA disagrees with the statements of Mr. Chester.</p> <p>From August 19, 1983 through July 13, 1995, this rule included the option to dispose of dead stock or offal at “an approved place of burial”. In 1994, James W. Gieszl, Maricopa By-Products, Inc., in consultation with Ray Kelly, of Baker, wrote to the Department of their joint interest in limiting disposal of animal waste to renderers and fully excluding landfills. A monopoly has existed in Arizona with respect to a publicly available rendering facility following the subsequent sale of Maricopa to Baker in August 1997.</p> <p>The ADA does not have the authority to prevent the use of regulated landfills for the routine disposal of dead stock and offal. These authorities are specifically given to the Arizona Department of Environmental Quality in Title 49 of the Arizona Revised Statutes. The ADA does distinguish its role with respect to the handling and disposal of animals with anthrax or foreign animal diseases. The authority over animal health issues is in subsection (E) of the rulemaking.</p>  |
| <p><b>Matthew Clarke, Associate, Ryley Carlock &amp; Applewhite, representing Baker Commodities</b>, writes regarding public health issues:</p> <ol style="list-style-type: none"> <li>1. “The Department has moved forward in this matter at an extraordinarily accelerated pace....”</li> <li>2. “[T]he Department has not considered the public and livestock health concerns posed by the proposed amendment.”</li> <li>3. “ADEQ has for more (sic) at least 26 years treated animal carcasses as solid waste.”</li> <li>4. “[T]here is no evidence that the ADEQ has conducted any research with respect to:...<br/>“the disposition of the volume of organic matter at issue...”<br/>“prevention of the spread of diseases that have recently had a tremendous adverse health impact on other countries...”<br/>“the many known diseases that have devastated other areas of this country....”</li> </ol> | <ol style="list-style-type: none"> <li>1. The ADA disagrees. The amendments to R3-2-206 are progressing as a regular rulemaking, delayed by the publication of both a Supplemental Proposed Rulemaking and a Notice of Public Hearing.</li> <li>2. The ADA disagrees. The public health issues were refuted by the State Public Health Veterinarian. Livestock health concerns are addressed in subsection (E) of the rule. On the other hand, no inspections of dead stock or offal processed by the renderer, Baker, occur before final product is released for sale. Inadequate rendering is the means by which Europe has been exposed to horrific recent outbreaks of bovine spongiform encephalopathy.</li> <li>3. We agree. The ADEQ has primacy in the area of solid waste management for the state of Arizona by the U.S. Environmental Protection Agency.</li> <li>4. The ADEQ is required by statute to meet the standards of the U.S. Environmental Protection Agency. At A.R.S. § 49-761(B)(1), ADEQ is authorized to “...adopt rules for solid waste landfills. Rules adopted pursuant to this paragraph shall not be more stringent than or conflict with 40 C.F.R. part 258 for nonprocedural standards, except that the department may adopt aquifer protection standards that are more stringent....Rules adopted pursuant to this paragraph are effective on the concurrence of the administrator....” At A.R.S. § 49-401.01, administrator is defined as the administrator of the U.S. Environmental Protection Agency.</li> </ol> |

The federal regulations were implemented pursuant to the requirements at 42 U.S.C. 6944: "Criteria for sanitary landfills; sanitary landfills required for all disposal". Subsection (a) states, "Not later than one year after October 21, 1976, after consultation with the States, and after notice and public hearings, the Administrator shall promulgate the regulations containing criteria for determining which facilities shall be classified as sanitary landfills and which shall be classified as open dumps within the meaning of this chapter. **At a minimum, such criteria shall provide that a facility may be classified as a sanitary landfill** and not an open dump **only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility.** [Emphasis added.]

On its web site, the U.S. Environmental Protection Agency has established a selection entitled "**MSW Disposal**" [Municipal Solid Waste], "**Landfilling**". At that location the agency states:

"Modern landfills are well-engineered facilities that are located, designed, operated, monitored, closed, cared for after closure, cleaned up when necessary, and financed to insure compliance with federal regulations. The federal regulations were established to protect human health and the environment. In addition, these new landfills can collect potentially harmful landfill gas emissions and convert the gas into energy."

**"Federal Landfill Standards"**

- **Location restrictions** ensure that landfills are built in suitable geological areas away from faults, wetlands, flood plains, or other restricted areas.
- **Liners** are geomembrane or plastic sheets reinforced with two feet of clay on the bottom and sides of landfills.
- **Operating practices** such as compacting and covering waste frequently with several inches of soil help reduce odor; control litter, insects, and rodents; and protect public health.
- **Groundwater monitoring** requires testing groundwater wells to determine whether waste materials have escaped from the landfill.
- **Closure and postclosure care** include covering landfills and providing long-term care of closed landfills.
- **Corrective action** controls and cleans up landfill releases and achieves groundwater protection standards.
- **Financial assurance** provides funding for environmental protection during and after landfill closure (i.e., closure and postclosure care)."

ADEQ has met the established guidelines. ADEQ allows disposal of dead animals at regulated landfills in Arizona.

The Arizona Department of Agriculture relies on the ability of the U.S. Environmental Protection Agency to provide scientific guidance to the states in this matter.

**Matthew Clarke, Associate, Ryley Carlock & Applewhite, representing Baker Commodities**, writes regarding public health issues:

“[T]here is no evidence that the ADEQ has conducted any research with respect to:...

“the conclusion by the European Union that animal carcasses should, whenever possible, be rendered and/or incinerated as opposed to buried....”

The ADA strongly disagrees with Mr. Clarke’s characterization of the European Union’s statements. The EU reminds us of the role of the rendering community in recent animal health debacles.

The **EU press release of March 13, 2002**, states:

“**What are animal by-products?** Animal by-products are the part of a slaughter animal not directly consumed by humans. These products are valorised in animal proteins like meat-and-bone meal, fats, gelatine, collagen, petfood and other technical products, such as glue, leathers, soaps, fertilisers etc. The alternative is their destruction, largely through incineration.”

“**What went wrong? Why did it go wrong?** It is clear from epidemiological analysis that the primary cause of BSE was the consumption of contaminated feed. What is not so clear is what was the initial source of the BSE agent in feed, as there are a number of alternatives still discussed by scientists.

“Regardless of the initial origin of BSE in cattle, it is clear that the epidemic was sustained and boosted by the recycling of BSE infected cattle material to other cattle from the mid 1980s onwards. Changes to rendering procedures in the 1970s/1980s would have allowed the infectious agent to survive during rendering of BSE infected animal by-products into meat and bone meal (MBM) and so enter cattle feed. The vast majority of cases have therefore been caused by cattle material being fed to other cattle.”

The **EU press release of November 20, 2001**, states:

“The Agriculture Council adopted the common position on the proposed regulation that prohibits the recycling of fallen stock and condemned animal material in animal feed. It prohibits “cannibalism”: intra-species recycling (healthy pigs to pigs or healthy poultry to poultry) will be banned. It ensures that the parts of a slaughtered animal that are not consumed by humans, also called ‘animal by-products’, can only be used in feed for farmed animals if they come from animals fit for human consumption.

“Animal by-products contaminated with BSE or scrapie, or with residues of prohibited substances (i.e. hormones used for growth promotion) or environmental contaminants (i.e. dioxins and PCB’s) must be completely disposed of as waste *by incineration or landfill* after undergoing appropriate heat treatment.” [Emphasis added]

“The regulation when adopted will ensure that the 16 million tonnes of animal by-products produced each year in the EU which are unsuitable for human consumption are processed in a safe manner. The total ban of feeding meat to farmed animals, a separate issue, stays in place without any date set to terminate. Today’s adopted proposal will however establish clear safety rules for the production of MBM in case it is ever re-authorised.”

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|   | <p>The conclusions of the European Union place the blame for outbreaks of BSE on cattle feed improperly prepared by rendering companies. Subsequent regulations in Europe place stricter controls on rendering operations that exist in this country. <i>Rendering is merely becoming an interim process before landfill burial or incineration of contaminated product.</i> [Emphasis added]</p> <p>The current rulemaking is with respect to the routine disposal of dead animals at regulated landfills, not of animals contaminated by exotic disease. The danger in Europe was created through the routine use of products produced by the rendering community.</p>  |
| <p><b>Ray Kelly, Executive Vice President, Los Angeles, CA, Headquarters Baker Commodities, Inc.</b></p> <p>[Baker operates facilities in Arizona, California, Hawaii, Massachusetts, New York, and Washington, with raw material collection stations in California, Nevada, Maine, Montana, New York, Oregon, Rhode Island, Vermont and Washington. Bulk liquid terminals owned or leased in Long Beach, CA, Tacoma, WA, Newington, NH, and Inchon, Korea, service Baker's vast tallow business.]</p> <p>Mr. Kelly's comments primarily address the economics of the rendering business in the United States, which will be addressed in the EIS, and the international health issues already reviewed above.</p> <p>M. Kelly states:<br/>         "Products produced from our operation are tallow, yellow grease, bone and meal, hides and our waste product is water. ...Farmers rely on these ingredients for meat and poultry production. In fact, the rendering industry returns the majority of its finished products to the feed industry. Renderers produce high energy fats and high quality protein ingredients that insure nutritionally balanced animal diets as guided by government regulations. These ingredients lead to more efficient production of beef, veal, pork, poultry, eggs and milk. Pets also benefit from the nutrient rich and flavorful ingredients of our pet foods. In Arizona, conservative estimates of the rendered products used in cattle and dairy rations is approximately 110 million pounds per year and which Baker Commodities currently supplies 40 percent."</p> <p>In his attachments, Mr. Kelly includes a letter from <b>Ellen E. Cox, Executive Director, Southwest Recycling</b>, who wrote:</p> | <p>Mr. Kelly's comments are appreciated.</p> <p>We note, however, that we have again confirmed with Bas Aja, of the Arizona Cattle Feeder's Association, his discussion of this rulemaking with local management of Baker Commodities at the time the docket was opened. He was advised that on behalf of Baker they had no interest in the Arizona rulemaking and would not intervene. Baker's only concern was an effort by an animal transporter to haul California dead stock to a Yuma landfill, an act prohibited under California law, § 1180.13, Transporting Dead Animals. Mr. Aja concurrently reported his conversation to Al Davis, Associate Director of the Animal Services Division at that time.</p> <p>The ADA notes that Baker Commodities refers us to the EU for only those processes that somewhat support its negative position on this rulemaking, but not those that would significantly impact its resale markets.</p> <p>As discussed above, the EU model uses rendering primarily as a sterilization method of dead stock and by-products before incineration or landfill disposal. The EU totally prohibits the recycling of dead stock into farmed animal (live-stock, poultry, and pigs) feed. Baker provides 44 million pounds of feed to Arizona livestock producers, however, the United States has only prohibited ruminant to ruminant feeding.</p> <p>The ADA thanks Ms. Cox for expressing her interest, and especially for noting that rendering is not a "green" industry and that Baker in particular, has some work to do to become "environmentally friendly". Landfill use does not produce either water discharge or smoke.</p> |

**Notices of Final Rulemaking**

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| <p>“After a discussion with the Vice President of Baker Commodities, who was forthcoming to all my questions, I feel rendering has more merit as a recycling tool, than landfilling. I am secure with the knowledge that the (Baker Commodities) have a way to go to comply with what I would require as an ‘environmentally friendly’ company. Example, more research on the water quality discharge from the Phoenix facility, and completed retrofitting of the smoke stack scrubbers for air quality.</p>   | <p>The ADA agrees that recycling has value, but the livestock industry producers must decide the most viable disposal method for their individual operations. That is their right under the Arizona statutes.</p>   |
| <p><b>Peg Guichard-Watters, Arizona Dept. of Environmental Quality, Manager, Solid Waste Section, stated:</b></p> <p>“The Department of Agriculture is proposing that dead animals be allowed to go to the sanitary landfills, to the ones that are regulated by the Department of Environmental Quality as an additional option for disposal of dead animals.”</p> <p>“I do not regulate rendering plants. I am not here to comment on how rendering plants are operated because I do not know. It’s been at least twenty years since I have inspected a rendering plant. However, my staff regulates the landfills that operate in this state, those that operate legally and they insure that they follow the regulations and from what I can tell from what ADA is proposing they are giving one more option for disposal of large animal carcasses and that is for it to go to a sanitary landfill which is regulated by ADEQ, meaning it is following state and federal requirements of which I believe my agency does a good job upholding and enforcing.”</p> | <p>The ADA agrees and thanks Ms. Guichard-Watters for her comments and the excellent work her section does to maintain the safe and healthful quality of Arizona regulated landfills.</p> <p>This rulemaking is with respect to movement of deceased animals and for that reason it was not necessary to discuss the issue of onsite burial permitted under the ADEQ statutes for agricultural landfills.</p> <p>While Ms. Guichard-Watters is neutral with respect to both the current rule and the proposed rulemaking, she confirms that the legal authority to dispose of large animals at a regulated sanitary landfill is permitted by law.</p> |
| <p><b>Philip MacDonnell, Partner, Jennings, Strouss &amp; Salmon, representing Waste Management.</b><br/>Mr. MacDonnell stated:<br/>“... a modern landfill is a safe method of disposal. It is not just my saying it, however, in particular in this area that you are looking at, a number of states permit landfill disposal. I did a quick survey last week when I heard about this issue and twenty-one states allow burial of dead livestock and I’ll submit to the Board here a copy of the state statutes or state rules that are applicable and a number of those specifically mention landfills, some of them prefer landfills.”</p>   | <p>The ADA thanks Mr. MacDonnell and Waste Management for his presence and the information and documentation provided.</p> <p>Waste Management provides comprehensive waste management services to municipal, commercial industrial and residential customers throughout North America. They operate 284 active landfill sites, 16 waste-to-energy plants, 73 landfill gas-to-energy facilities, 160 recycling plants, 293 transfer stations and more than 1400 collection facilities.<br/>The Department agrees that a modern landfill is a safe method of disposal.</p>   |

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| <p><b>Bas Aja, representing the Arizona Cattle Feeder’s Association (membership is comprised of over 350 individuals who feed cattle in Arizona feedlots) stated:</b></p> <p>“The Arizona Cattle Feeder’s Association supports the rule change as proposed by the Department of Agriculture and I’d like to touch on a few reasons why.</p> <p>“I’m not here to disparage the rendering industry. They have a key role to play in recycling in a number of areas, but, I do believe in this specific instance that given the nature of rendering in this state, what we are not talking about is an industry, per se, we are talking about a company. There is only one company that performs that for feed lots and live-stock producers in this state, and to eliminate any other option such as municipal landfills which has proven safe over time, might be the dark avenue of self-interest we have heard expressed here before. Secondly, as it relates to BSE, and there was a lot of discussions about that. ...landfills have never been recognized or identified as a risk for the transmission of BSE. Rendered by-products have.”</p> <p>“So, finally, we would like to close by saying that there are, given that 73 million acres that covers our vast state, the over one million head of livestock in this state and the few number of locations for rendering processes and the vast number of locations for registered landfills, we believe that it is in the best interest of the livestock industry and public health to continue what we believe is a legal process and that is allowing those animals to be disposed of at a registered landfill.”</p> | <p>The ADA agrees and thanks Mr. Aja and the Arizona Cattle Feeder’s Association for his comments.</p> <p>The key issues in contest are:</p> <ol style="list-style-type: none"> <li>1. The legality of the routine disposal of dead animals at regulated landfills,</li> <li>2. The authority for that regulation exists in statute under the auspices of the Arizona Department of Environmental Quality, and</li> <li>3. The Arizona Department of Agriculture and other state agencies erred in 1995 when the current rule was promulgated, deleting the use of landfills, without underlying statutory authority.</li> </ol> <p>The current rulemaking enables the livestock industry to operate under state rules that will no longer be in conflict. The current rulemaking re-establishes the primacy of the ADEQ in matters of solid waste management, in concert with the established guidelines of the United States Environmental Protection Agency.</p> <p>The current rulemaking continues the pre-eminent interest of the Arizona Department of Agriculture in ensuring the health of animals in this state. Every effort is made and will continue to be made to ensure that Arizona remains a “clean” state with regard to exotic animal disease.</p> <p>The Department is grateful for the interest shown in the rulemaking and the participation of varied private and public interests.</p> |
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The Arizona Department of Agriculture’s Advisory Council supported this rulemaking by motion at a Council meeting on January 17, 2002. The Department appreciates the support of the Council.

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

None

**13. Incorporations by reference and their location in the rules:**

None

**14. Was this rule previously made as an emergency rule?**

No

**15. The full text of the rules follows:**

**TITLE 3. AGRICULTURE**

**CHAPTER 2. DEPARTMENT OF AGRICULTURE  
ANIMAL SERVICES DIVISION**

**ARTICLE 2. MEAT AND POULTRY INSPECTION**

Section

R3-2-206. Purchase, Sale, Collection, Transportation, Disposition, and Use of Meat or Meat Food Products; Dead Animals; Animal Bone, Animal Fat, ~~Animals-Offals~~ Animal Offal

**ARTICLE 2. MEAT AND POULTRY INSPECTION**

**R3-2-206. Purchase, Sale, Collection, Transportation, Disposition, and Use of Meat or Meat Food Products; Dead Animals; Animal Bone, Animal Fat, ~~Animals-Offals~~ Animal Offal**

**A. ~~No~~ A person shall not buy, sell, offer for sale, store, transport, receive, or collect any meat or meat food product except as provided in this subsection.**

Notices of Final Rulemaking

1. Any of the following meat or meat food products may be bought, sold, or offered for sale as animal food and may be stored, transported, received, or collected anywhere within the state:
  - a. Any meat or meat food product ~~which has been~~ that is processed in an animal food manufacturing plant licensed by the Department;
  - b. Any meat or meat food product ~~which has come~~ that comes from an animal that ~~has died~~ by slaughter or ~~has been~~ is approved or passed for animal food by either state or federal meat inspectors;
  - c. Any meat or meat food product ~~which has been~~ that is thoroughly cooked at a minimum temperature of 180° F. for 30 minutes and ~~has been~~ is certified by ~~a state or a federal meat inspectors~~ an inspector having jurisdiction at the place of processing.
2. A carcass with the hide, hair, or pelt still on the carcass may be bought, sold, offered for sale, collected and transported to; or received ~~or stored~~ by the following only:
  - a. A rendering or tallow plant;
  - b. A state or county diagnostic laboratory, a veterinarian's clinic, or crematory; ~~or~~;
  - c. An animal food manufacturing plant;
  - d. A landfill regulated by the Arizona Department of Environmental Quality;
  - e. An out-of-state landfill regulated by that state's landfill regulatory authority; or
  - f. A landfill located on a Native American reservation that is regulated by equivalent standards to those prescribed by the Arizona Department of Environmental Quality.
3. Any meat or meat food product described in ~~subsections~~ subsection (A)(1) and (2) or a carcass with the hide, hair, or pelt still on the carcass from an official state or federal slaughter establishment shall be denatured with a denaturant that will not leave a toxic residue and is removable when ~~steam is distilled~~ steam-distilled at atmospheric pressure.
4. Any meat or meat food product that has been condemned by state or federal meat inspectors shall be treated as provided in 9 CFR 314.3, which has been incorporated by reference in R3-2-202, and may be disposed of as provided in that rule or may be collected and transported to or received ~~and stored in~~ by a rendering or tallow plant or a state or county diagnostic laboratory or crematory.
- B. A person engaged commercially in the collection or transportation of dead animal carcasses or inedible meat shall ~~be registered~~ register with the Department as a dead animal hauler as prescribed in R3-2-203(B) and shall maintain and keep all records for ~~such period of the time as~~ required by R3-2-203(C).
- C. ~~All vehicles and~~ A vehicle or other means of conveyance used to transport ~~a dead animal carcasses~~ carcass or inedible meat shall be:
  1. ~~leak proof~~ Leak-proof,
  2. ~~constructed~~ Constructed of impervious materials that permit thorough cleaning and sanitizing, ~~and~~
  3. ~~equipped~~ Equipped to ~~assure the control of~~ insects and odors and prevent the spread of disease, ~~and~~
  4. Comply with the Department of Environmental Quality vehicle requirements prescribed in R18-13-310(A) and (B).
- D. ~~Except as provided in subsection (E),~~ A ~~a~~ dead animal carcass may be ~~processed~~ rendered or made into animal food only at a licensed rendering or ~~an~~ animal food manufacturing plant as prescribed in A.R.S. § 3-2088 and this Article.
- E. Dead animals diagnosed with anthrax or an animal disease foreign to the United States shall be handled as directed by the State Veterinarian.
- E.F. Discarded animal bone, animal fat, and animal ~~offals~~ offal generated by ~~a wholesale food manufacturers~~ manufacturer shall be transported; ~~to and received, and rendered only by~~ only a:
  1. ~~licensed~~ Licensed rendering plant; ~~or~~
  2. Landfill, as prescribed in subsections (A)(2)(d), (A)(2)(e), and (A)(2)(f).

**NOTICE OF FINAL RULEMAKING**

**TITLE 12. NATURAL RESOURCES**

**CHAPTER 4. GAME AND FISH COMMISSION**

**PREAMBLE**

**1. Sections Affected**

R12-4-501  
R12-4-502  
R12-4-503  
R12-4-505  
R12-4-506  
R12-4-507  
R12-4-511  
R12-4-512  
R12-4-513  
R12-4-517  
R12-4-520  
R12-4-522  
R12-4-523  
R12-4-524  
R12-4-525

**Rulemaking Action**

Amend  
New Section  
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. § 5-311(A)(1) for all rules  
A.R.S. §§ 5-321(A) and 5-391(A) for R12-4-502

Implementing statutes:

A.R.S. § 5-301 for R12-4-501  
A.R.S. § 5-311(A)(5) for R12-4-502, R12-4-507, and R12-4-517  
A.R.S. § 5-321 for R12-4-503  
A.R.S. § 5-311 for R12-4-506  
A.R.S. § 5-331 for R12-4-511  
A.R.S. §§ 5-311(A)(5) and 5-332 for R12-4-512  
A.R.S. § 5-349 for R12-4-513  
A.R.S. §§ 5-311(A)(4) and 5-361 for R12-4-520, R12-4-522, and R12-4-523  
A.R.S. §§ 5-346(C) and 5-311 for R12-4-524  
A.R.S. § 5-391(H) for R12-4-525

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

July 10, 2002

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

Notice of Rulemaking Docket Opening: 7 A.A.R. 1681, April 20, 2001  
Notice of Public Meeting on Open Rulemaking Docket: 7 A.A.R. 2332, June 8, 2001  
Notice of Public Meeting on Open Rulemaking Docket: 7 A.A.R. 3056, July 13, 2001  
Notice of Proposed Rulemaking: 8 A.A.R. 1780, April 12, 2002

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

Name: Mark E. Naugle, Manager, Rules and Risk Management  
Address: Arizona Game and Fish Department DORR  
2221 W. Greenway  
Phoenix, AZ 85023-4399

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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Telephone: (602) 789-3289

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

The proposed rulemaking is primarily a result of the 2000 five-year rules review of Article 5, which identified potential amendments to the Article 5 rules to update and clarify specific and general provisions of the Arizona Game and Fish Commission Boating and Water Sports rules.

**R12-4-501. Boating and Water Sports Definitions**

The proposed rulemaking for R12-4-501 involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5. These changes will make the rule consistent with recent statutory changes and will correct outdated material and improve the accuracy, clarity, and understandability of the rule. The objective of R12-4-501 is to define the terms used in Article 5, Boating and Water Sports. The proposed rulemaking makes the following amendments to R12-4-501:

- Revises subsection (9) to clarify that no person shall be towed on inflatable devices [in "NO SKI" areas].
- Revises subsection (10) to add a reference to "flat wake," as identified in A.R.S. § 5-350(C)(1).
- Revises existing subsection (19) to identify that for the purposes of registration only, "watercraft" does not mean nonmotorized watercraft of any length (Title 5 changed in 1999 to no longer require the registration of canoes).
- Adds a definition of "personal flotation device" to the list of definitions.
- Amends the rule where necessary to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-502. Application for Watercraft Registration**

The proposed rulemaking for R12-4-502 involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5. These changes will make the rule consistent with recent statutory changes and will correct outdated material and improve the accuracy, clarity, and understandability of the rule. The objective of R12-4-502 is to establish application requirements for Arizona watercraft registration. The proposed rulemaking makes the following amendments to R12-4-502:

- Revises subsection (E) to add language conforming to the National Association of State Boating Law Administration (NASBLA) model act that clarifies that dealer numbers are for demonstration purposes only and not for personal use by a manufacturer, dealer, staff, or family.
- Deletes existing subsections (F) through (J) and replaces them with new subsections (F) through (H) to clarify and simplify the existing rule language.
- Amends the rule where necessary to make the rule language consistent with the rest of Article 5 and with the current requirements for rulemaking language and style.

**R12-4-503. Renewal of Watercraft Registration**

The proposed rulemaking for R12-4-503 involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5. These changes will make the rule consistent with recent statutory changes and will correct outdated material and improve the accuracy, clarity, and understandability of the rule. The objective of R12-4-503 is to specify the Department's time-frames for notifying owners of expiration of watercraft registration and to prescribe the owner's responsibilities for renewal. The proposed rulemaking makes the following amendments to R12-4-503:

- Amends the rule to incorporate changes to A.R.S. § 5-321, which allows watercraft owners to renew their registration by telecommunications.
- Amends the rule where necessary to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-505. Hull Identification Numbers**

The objective of R12-4-505 is to prescribe the requirements for assigning a Hull Identification Number to a watercraft that is missing a number. The rule also establishes the requirements for the placement of a Hull Identification Number on a watercraft. The proposed rulemaking for R12-4-505 amends the rule to remove the word "improper" from subsection (B)(2). Under this provision of the rule, the Department has assigned new hull ID numbers in the case of improper existing hull ID numbers caused by a manufacturer error, errors by governmental jurisdictions, or

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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noncompliance by previous owners. Watercraft under this scenario end up with two hull ID numbers, and this has been confusing to enforcement personnel, burdensome to the Department and watercraft manufacturers, and a potential safety issue for watercraft owners in the event of manufacturer safety recalls. The proposed rulemaking also makes technical corrections and drafting style changes to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-506. Invalidation of Watercraft Registration**

The proposed rulemaking for R12-4-506 involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5. These changes will make the rule consistent with recent statutory changes and will correct outdated material and improve the accuracy, clarity, and understandability of the rule. The objective of R12-4-506 is to invalidate a registration obtained by fraud or misrepresentation, to demand the return of the invalid certificate and decals within 15 calendar days of receiving written notification from the Department, and to ensure that renewal or transfer of an invalid watercraft does not take place until the reason for invalidity has been corrected or no longer exists. The proposed rulemaking makes the following amendments to R12-4-506:

- Amends the rule to add subsection (B)(5) to prescribe that certificates and decals are invalid if incomplete or incorrect information is given and an applicant refuses to comply with the Department's request to provide correct information or return certificates and decals. This is an administrative change necessary to make the rule consistent with the provisions of R12-4-502.
- Amends the rule to add subsection (B)(5) to make certificates and decals invalid if the Department has revoked the certificate of number, numbers, and decals as provided in A.R.S. § 5-391(H). This is an administrative change necessary to make the rule consistent with the provisions of proposed new Section R12-4-525.
- Amends the rule where necessary to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-507. Application for Registration of Abandoned or Unreleased Watercraft**

The objective of R12-4-507 is to prescribe procedures to allow for the registration of a watercraft that has been abandoned or for which there is no legal release of interest from the registered owner. This rule also protects the interest of the legally registered owner by preventing the registration of a stolen watercraft to another person. The proposed rulemaking makes the following amendments to R12-4-507:

- Makes an administrative change to subsection (A) to delete the definition for "Unreleased watercraft," which does not need to be defined since it is not used in the rule language.
- Adds the following definition to subsection (A) to clarify the intent of the rule: "*Release of interest* means a statement giving up, surrendering, or abandoning unconditionally any claim or right of ownership or use in a watercraft."
- Adds to subsection (C) a requirement that applicants identify the state in which a watercraft will be used. This will allow the Department to verify that Arizona will be the state of primary use before undertaking the costly and time-consuming process of researching an abandoned or unreleased watercraft. In the past, this has been a problem with individuals registering a watercraft in Nevada, which has no process to identify ownership for abandoned watercraft.
- Amends subsection (D) for clarity and conciseness.
- Amends subsection (E)(1) to shorten and simplify the advertisement requirements for the registration of abandoned or unreleased watercraft, which will benefit the public by lowering the costs for advertising.
- Amends subsection (E)(2) to change "proof of publication" to "affidavit."
- Makes technical corrections and drafting style changes to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-511. Personal Flotation Devices**

The main objective of R12-4-511 is safety. A.R.S. § 5-331(A) requires all watercraft, except sailboards, to carry United States Coast Guard approved personal flotation devices, and R12-4-511 prescribes the type and category of the required devices. The proposed rulemaking makes the following amendments to R12-4-511:

- Deletes subsection (C), which is outdated and no longer relevant. This provision of the proposed rulemaking is hereafter referred to as an administrative housekeeping change to the rule.
- Adds new subsection (C) that clarifies that as prescribed in A.R.S. § 5-331(C) and A.R.S. § 5-350(A), children 12 years of age or under on board a watercraft, and any person on board a personal watercraft, shall

wear an appropriately-sized, U.S. Coast Guard-approved personal flotation device. This provision of the proposed rulemaking is hereafter referred to as an administrative housekeeping change to the rule.

- Adds a new subsection that defines “wear” as it relates to the use of a personal flotation device: “Wear” means that the personal flotation device is being worn according to the manufacturer’s design or recommended use; that all closures of the personal flotation device are fastened, snapped, tied, zipped, or secured according to the manufacturer’s design or recommended use; and that the personal flotation device is adjusted for a snug fit.
- Adds a new subsection that specifies that subsections (A), (B), and (C) do not apply to the operation of a racing shell or rowing skull during competitive racing or supervised training if the racing shell or rowing skull is manually propelled; recognized by a national or international association for use in competitive racing; and is designed to carry and does carry only equipment which is solely for competitive racing. Federal regulations under 33 CFR 175.3 and 175.17(C) exempt racing shells and rowing skulls from the requirement to carry United States Coast Guard approved personal flotation devices, and the proposed rulemaking will make R12-4-511 consistent with these regulations. This provision of the proposed rulemaking is hereafter referred to as an administrative housekeeping change to the rule.
- Makes technical corrections and drafting style changes to make the rule language consistent with the current requirements for rulemaking language and style. This provision of the proposed rulemaking is hereafter referred to as an administrative housekeeping change to the rule.

#### **R12-4-512. Fire Extinguishers Required for Watercraft**

A.R.S. § 5-332 requires all watercraft that are fueled with volatile liquid to carry a fire extinguisher unless exempted by the Commission. R12-4-512 sets forth fire extinguisher requirements and exemptions, with safety as the first concern. The proposed rulemaking makes the following amendments to R12-4-512:

- Reorders the subsections in a more logical manner, with existing subsection (C) becoming new subsection (A); existing subsection (A) becoming new subsection (B); and existing subsection (B) becoming new subsection (C). This provision of the proposed rulemaking is hereafter referred to as an administrative housekeeping change to the rule.
- Adds new subsection (A)(7) to require that when a fixed fire extinguishing system is installed in the machinery space, there shall also be on board at least one B-I type approved hand portable fire extinguisher. This is to provide fire extinguisher coverage for other potential fire hazards on the watercraft that a fixed system cannot address.
- Makes technical corrections and drafting style changes to make the rule language consistent with the current requirements for rulemaking language and style. This provision of the proposed rulemaking is hereafter referred to as an administrative housekeeping change to the rule.

#### **R12-4-513. Watercraft Casualty Reports**

The objective of the rule is to ensure that boating accident information is provided to the Department for forwarding to the United States Coast Guard. The proposed rulemaking makes the following amendments to R12-4-513:

- Amends the rule to incorporate changes to A.R.S. § 5-349, which establish a minimum threshold of \$500 property damage for reporting watercraft accidents. Under the statutory change and the proposed rulemaking, only those individuals involved in an accident involving property damage exceeding \$500 are required to fill out a report.
- The proposed rulemaking also makes technical corrections and drafting style changes to make the rule language consistent with the current requirements for rulemaking language and style.

#### **R12-4-517. Watercraft and Boat Motor and Engine Restrictions**

The objective of R12-4-517 is to restrict the use of watercraft and boat engines on certain bodies of water in order to protect the public and the environment. The proposed rulemaking makes the following amendments to R12-4-517:

- Amends the rule to remove Becker Lake, Concho Lake, Lower Lake Pleasant, Nelson Reservoir, and River Reservoir from the list that restricts watercraft to an electric motor only.
- Amends the rule to add Ackre Lake, Carnero Lake, Fortuna Lake, Goldwater Lake, Hulsey Lake, Horsethief Basin Lake, Pratt Lake, Quigley Lake, Redondo Lake, and Willow Lake to the list that restricts watercraft to an electric motor only.
- Amends the rule to raise the maximum allowable horsepower rating of motors in subsection (B) waterways from 8hp to 10hp, since 9.9hp is now the standard for electric start.

- Amends the rule to add Becker Lake, Concho Lake, Little Mormon Lake, Mexican Hay Lake, Nelson Reservoir, River Reservoir, Whipple Lake, and White Mountain Lake (in Apache County) to the list that restricts watercraft to an electric motor or gasoline engine not exceeding 10 manufacturer-rated horsepower.
- Makes technical corrections and drafting style changes to make the rule language consistent with the current requirements for rulemaking language and style. This provision of the proposed rulemaking is hereafter referred to as an administrative housekeeping change to the rule.

**R12-4-520. Arizona Uniform State Waterway Marking System**

The proposed rulemaking for R12-4-520 involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5. These changes will make the rule consistent with recent statutory changes and will correct outdated material and improve the accuracy, clarity, and understandability of the rule. A.R.S. § 5-361 prohibits marking the waters of this state in any manner in conflict with the uniform navigational marking standards as prescribed by the Commission or the U.S. Coast Guard. A.R.S. § 5-311(B) further requires that the Commission's rules cannot be in conflict with those prescribed by the U.S. Coast Guard. R12-4-520 prescribes the state's standards for regulatory markers and aids to navigation to be as established in the U.S. Coast Guard's Code of Federal Regulations. The proposed rulemaking makes the following amendments to R12-4-520:

- Amends the rule to update the incorporation by reference.
- Amends the rule where necessary to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-522. Establishment of Controlled-Use Markers**

The proposed rulemaking for R12-4-522 involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5. These changes will make the rule consistent with recent statutory changes and will correct outdated material and improve the accuracy, clarity, and understandability of the rule. The objective of R12-4-522 is to delegate the Commission's authority to authorize the establishment of controlled-use areas and the placement of controlled-use markers on waters under the lawful jurisdiction of other governmental agencies and authorities; to establish criteria for controlling use; and to impose a requirement of proper notification of the controlled-use restriction. The proposed rulemaking makes the following amendments to R12-4-522:

- Deletes the first sentence of subsection (A), which is a confusing and misleading interpretation of A.R.S. § 5-361(A).
- Amends the rule where necessary to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-523. Controlled Operation of Watercraft**

The proposed rulemaking for R12-4-523 involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5. These changes will make the rule consistent with recent statutory changes and will correct outdated material and improve the accuracy, clarity, and understandability of the rule. The objective of R12-4-523 is to require watercraft operators to comply with any controlled-use restrictions pursuant to lawfully established controlled-use markers. The rule allows certain exceptions for the conduct of official duties and for permitted regatta events. The proposed rulemaking makes the following amendments to R12-4-523:

- Amends the language of subsection (A) to clarify the meaning of "similar contrivance" as it applies to a person operating a watercraft or towing a person with a watercraft in a manner contrary to the lawfully imposed area restrictions identified by lawfully established controlled-use markers.
- Amends the rule where necessary to make the rule language consistent with the current requirements for rulemaking language and style.

**R12-4-524. Water Skiing**

The proposed rulemaking adds a new Section requiring that a person be physically capable and mentally competent to act as an observer of a water skier. The proposed new Section will help to ensure that the observer, who holds a lot of responsibility for the safety of the water skier, has the judgment and skills necessary to properly display a ski flag. Water skiers will benefit directly by having an observer who is able to display a ski flag in a timely and consistent manner, thus increasing the water skier's safety. Other water users will benefit indirectly by knowing that a well-displayed ski flag means that there is a skier or a towrope in the water, which will reduce the chance of them having an accident with a skier or a towrope.

**R12-4-525. Watercraft Certificate of Number, Numbers, and Decal Revocation**

A.R.S. § 5-391(H) states that “Upon receipt of notice of conviction of a person under subsection F or G of this section, the department may revoke the numbers and decals issued to the watercraft which was involved in the violation and any other watercraft owned by the person convicted.” R12-4-525 is a new Section that prescribes the procedures that the Department will use under A.R.S. § 5-391(H) to revoke the numbers and decals issued to the watercraft owned by a person convicted under A.R.S. § 5-391(F), and the numbers and decals issued to the watercraft involved in a violation under A.R.S. § 5-391(G). This rulemaking is in response to the Auditor General’s findings in Sunset Factor 4 of the 2001 Auditor General’s Performance Audit of the Arizona Game and Fish Department Wildlife Management Program.

**7. A reference to any study that the agency relied on in its evaluation of or justification for the final rules and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:**

None

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

Not applicable

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

**R12-4-501. Boating and Water Sports Definitions**

**R12-4-502. Application for Watercraft Registration**

**R12-4-503. Renewal of Watercraft Registration**

**R12-4-506. Invalidation of Watercraft Registration**

**R12-4-520. Arizona Uniform State Waterway Marking System**

**R12-4-522. Establishment of Controlled-Use Markers**

**R12-4-523. Controlled Operation of Watercraft**

The proposed rulemaking, which involves administrative housekeeping and drafting style changes identified in the 2000 five-year rules review of Article 5, will benefit the general public, private persons, and consumers by providing updated rules that are more readable and more easily understood. No additional costs are anticipated for the general public, private persons, and consumers who are directly or indirectly affected by the proposed rulemaking.

There will be no additional costs and no reduction in revenues to small or large businesses resulting from these rule amendments, and there is no anticipated effect on the revenues or payroll expenditures of employers who are subject to or affected by the proposed rulemaking.

The Department anticipates that the benefits from the proposed rulemaking will outweigh the costs to the Department, other agencies, political subdivisions, the general public, private persons, consumers, and any small or large businesses directly affected by the implementation and enforcement of the proposed rulemaking.

**R12-4-505. Hull Identification Numbers**

The proposed rulemaking for R12-4-505 will directly benefit individuals who purchase a new watercraft with an improper HIN (hull ID number), when the improper HIN is the result of manufacturer errors, errors by governmental jurisdictions, or noncompliance of previous owners. The proposed rulemaking eliminates the requirement for the Department to issue new HINs (hull ID numbers) in these cases. Under the proposed rulemaking, a watercraft owner who had no responsibility for the error or noncompliance is not unfairly penalized by having to place a secondary hull identification number on the watercraft. The proposed rulemaking also solves a potential safety issue, since watercraft safety recalls reference the original HINs, regardless of whether or not they are in the proper numbering format.

The rule does not impose any additional financial burdens on watercraft owners, manufacturers, or watercraft law enforcement agencies, and the Department has determined that the benefits of the proposed rulemaking outweigh any costs.

**R12-4-507. Application for Registration of Abandoned or Unreleased Watercraft**

Except for those costs directly associated with the rulemaking itself, the proposed rulemaking will result in no added cost to individuals, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, or to other agencies.

Information about the proposed rule changes will be disseminated to Department personnel, the public, and other agencies as a part of the normal process of updating the information the Department annually publishes in the hunt

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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regulations. Departmental enforcement related to the rulemaking will be integrated into existing enforcement responsibilities.

No other agencies or political subdivisions of the state are directly affected by the implementation and enforcement of the proposed rulemaking, and there are no small businesses subject to the proposed rulemaking.

The Department has determined that the overall benefits of the proposed rulemaking outweigh any costs.

**R12-4-511. Personal Flotation Devices**

**I. The proposal to add a new subsection that defines “wear” as it relates to the use of a personal flotation device**

The proposed rulemaking adds a definition of “wear” and adds a new subsection clarifying that as prescribed in A.R.S. § 5-331(C) and A.R.S. § 5-350(A), children 12 years of age or under on board a watercraft, and any person on board a personal watercraft, shall wear an appropriately-sized, U.S. Coast Guard-approved personal flotation device. Personal flotation devices are only effective when worn properly, and the ultimate purpose of the proposed rulemaking is to help save lives.

Enforcement related to the rulemaking will be integrated into the existing enforcement responsibilities of the Department and those political subdivisions of the state that enforce the Commission’s Boating and Water Sports rules. Enforcement officers can check for rule compliance when routinely patrolling the waterways of Arizona. The proposed rulemaking does have the potential to generate increased citations for personal flotation device safety violations, and this in turn may create an increased workload for the Department and political subdivisions of the state. An estimate of how many additional citations will be issued, and how large the corresponding workload increase will be cannot be determined at this time, since it will be dependent, to a significant degree, on how successful the Department’s boater safety education program is in educating the public about the proposed amendments to rule. If there is an increase in citations, a portion of any increased costs to the political subdivisions of the state will be offset by the additional fines collected as a result these citations.

The proposed rulemaking will benefit the general public, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, and other agencies directly affected by the implementation and enforcement of the proposed rulemaking by increasing the safety on Arizona’s waterways, which will ultimately reduce the costs of boating safety enforcement.

The proposed rulemaking does not involve any additional costs or reduction in revenues to private persons and consumers who are directly affected by the proposed rulemaking, and the Department anticipates that the benefits from the proposed rulemaking will outweigh any costs to the Department, other agencies, political subdivisions, the general public, private persons, and any consumers, directly affected by the implementation and enforcement of the proposed rulemaking.

**II. The proposed administrative housekeeping rule amendments**

Except for those costs directly associated with the rulemaking itself, the proposed administrative housekeeping rule amendments will result in no added cost to individuals, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, or to other agencies directly affected by the implementation and enforcement of the proposed rulemaking.

The proposed rulemaking will benefit the general public, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, and other agencies directly affected by the implementation and enforcement of the proposed rulemaking by amending outdated language and by making the language of the rule consistent federal regulations and with the current Administrative Procedures Act requirements for rulemaking language and style.

The Department has therefore determined that the benefits of the proposed administrative housekeeping rule changes outweigh any costs.

**R12-4-512. Fire Extinguishers Required for Watercraft**

**I. The proposal to add new subsection (A)(7) to require that when a fixed fire extinguishing system is installed in the machinery space, there shall also be on board at least one B-1 type approved hand portable fire extinguisher**

Under the current provisions of the rule, a hand portable fire extinguisher is not required for watercraft under 26 feet if a fixed fire extinguishing system is installed in the machinery space. Implementing the proposed rule amendment will increase boater safety by requiring that a hand portable fire extinguisher be available to fight fires occurring outside of the range of the fixed fire extinguishing system. Examples of fires that can occur on a watercraft outside of the machinery space include fires associated with cooking (especially with barbecue grills), fires associated with careless disposal of smoking materials, dock fires, and fires on other watercraft. Approximately 1,000 to 10,000 watercraft owners with fixed fire extinguisher systems will be directly affected by the proposed rulemaking. There will be a direct cost to watercraft owners with fixed fire extinguishing systems who do not already have a hand portable fire extinguisher. These individuals will be required to purchase an extra fire extinguisher under the proposed rulemaking, at a cost of between \$12 and \$40 each.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

Businesses that rent watercraft under 26 feet with fixed fire extinguishing systems in the machinery space will be subject to the proposed rule amendments and will be required to add portable hand fire extinguishers to any of these types of watercraft that they rent. In actuality, however, very few of these types of watercraft are rented, since they are mostly in the category of high performance and high dollar value. Additional costs to watercraft rental businesses will therefore be very limited in scope, and no impact is expected on the revenues or payroll expenditures of these types of businesses.

Any fire on a watercraft is a serious matter, and the Department has determined that the safety benefits of the proposed rulemaking outweigh any costs.

**II. The proposed administrative housekeeping rule amendments**

Except for those costs directly associated with the rulemaking itself, the proposed administrative housekeeping rule amendments will result in no added cost to individuals, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, or to other agencies directly affected by the implementation and enforcement of the proposed rulemaking.

The proposed rulemaking will benefit the general public, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, and other agencies directly affected by the implementation and enforcement of the proposed rulemaking by amending outdated language and by making the language of the rule consistent with the current Administrative Procedures Act requirements for rulemaking language and style.

The Department has therefore determined that the benefits of the proposed administrative housekeeping rule changes outweigh any costs.

**R12-4-513. Watercraft Accident and Casualty Reports**

The proposed rulemaking decreases monitoring, recordkeeping, and reporting burdens on the Department, other state agencies, political subdivisions, businesses, and individuals. Under A.R.S. § 41-1055(D)(3), the agency is thus exempt from providing an economic, small business, and consumer impact statement.

**R12-4-517. Watercraft ~~and Boat~~ Motor and Engine Restrictions**

**I. The proposal to remove Becker Lake, Concho Lake, Lower Lake Pleasant, Nelson Reservoir, and River Reservoir from the list that restricts watercraft to an electric motor only**

The proposed rulemaking will give individuals at Becker Lake, Concho Lake, Lower Lake Pleasant, Nelson Reservoir, and River Reservoir the option of using gasoline-powered engines on these lakes. Wind conditions make electric motors impractical at certain times of the year on these lakes, and under the proposed rulemaking boaters and anglers will have more usage days available to them. There will be no added cost to individuals, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, or to other agencies directly affected by the implementation and enforcement of the proposed rulemaking. The Department has therefore determined that the benefits of the proposed rule changes outweigh any costs.

**II. The proposal to add Ackre Lake, Carnero Lake, Fortuna Lake, Goldwater Lake, Hulsey Lake, Horsethief Basin Lake, Pratt Lake, Quigley Lake, Redondo Lake, and Willow Lake to the list that restricts watercraft to an electric motor only**

There is currently limited usage (and in some cases, no usage) of gasoline engines at these lakes. While this is not expected to change in the short term (due mostly to the size of these lakes), watercraft usage is increasing statewide and the Department feels that it is prudent at this time to protect the quality of the boating and angling experience at these lakes by initiating rule changes which will prohibit the use of gasoline engines on these lakes. The impact on individuals is expected to be minimal, and the Department has therefore determined that the benefits of the proposed rule changes outweigh any costs.

**III. The proposal to raise the maximum allowable horsepower rating of motors in subsection (B) waterways from 8hp to 10hp**

Anglers and boaters with watercraft motors between 8hp. and 10hp. will be able to fish waterways that were previously off limits due to 8hp. motor restrictions. This change will be especially helpful to the elderly and the disabled since 9.9hp is now the standard for electric start engines. Under the current provisions of the rule, these 9.9hp electric start engines cannot be used. This forces the elderly and the disabled to use engines that require a manual start, which is difficult or impossible for some of these individuals. The proposed rulemaking will open up recreational opportunities to these individuals that would otherwise be denied due to the limitations imposed by the current provisions of the rule.

There will be no added cost to individuals, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, or to other agencies directly affected by the implementation and enforcement of the proposed rulemaking. The Department has therefore determined that the benefits of the proposed rule changes outweigh any costs.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

**IV. The proposal to add Becker Lake, Concho Lake, Little Mormon Lake, Mexican Hay Lake, Nelson Reservoir, River Reservoir, Whipple Lake, and White Mountain Lake (in Apache County) to the list that restricts watercraft to an electric motor or gasoline engine not exceeding 10 manufacturer-rated horsepower**

The proposed rulemaking will give individuals at Becker Lake, Concho Lake, Little Mormon Lake, Mexican Hay Lake, Nelson Reservoir, River Reservoir, Whipple Lake, and White Mountain Lake (in Apache County) the option of using electric motors or gasoline-powered engines not exceeding 10 manufacturer-rated horsepower on these lakes. Wind conditions make electric motors impractical at certain times of the year on these lakes, and under the proposed rulemaking boaters and anglers will have more usage days available to them. There will be no added cost to individuals, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, or to other agencies directly affected by the implementation and enforcement of the proposed rulemaking. The Department has therefore determined that the benefits of the proposed rule changes outweigh any costs.

**V. The proposed administrative housekeeping rule amendments**

Except for those costs directly associated with the rulemaking itself, the proposed administrative housekeeping rule amendments will result in no added cost to individuals, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, or to other agencies directly affected by the implementation and enforcement of the proposed rulemaking.

The proposed rulemaking will benefit the general public, businesses, the Arizona Game and Fish Department, the political subdivisions of the state, and other agencies directly affected by the implementation and enforcement of the proposed rulemaking by amending outdated language and by making the language of the rule consistent with the current Administrative Procedures Act requirements for rulemaking language and style.

The Department has therefore determined that the benefits of the proposed administrative housekeeping rule changes outweigh any costs.

**R12-4-524. Water Skiing**

The general public is the ultimate beneficiary of the proposed rulemaking. Individuals directly affected by the proposed rulemaking include all users of Arizona waters where water skiing is allowed. The proposed rulemaking will increase the safety for water skiers and for watercraft operators encountering water skiers on the waters of Arizona. Water skiers will benefit directly by having an observer who is able to display a ski flag in a timely and consistent manner, thus increasing the safety for a skier who is down in the water. Other water users will benefit indirectly by knowing that a well-displayed ski flag means that there is a skier or a towrope in the water, which will reduce the chance of them having an accident with a skier or a towrope.

Enforcement activities related to the rulemaking will be integrated into the existing enforcement responsibilities of the Department and any other agencies charged with enforcement of the Commission's Boating and Water Sports rules. Enforcement officers can check for rule compliance when routinely patrolling the waterways of Arizona. Operating costs to the Department will thus be minimal, associated only with the dissemination of information regarding the rulemaking to watercraft users, water sport participants, boat dealers, other law enforcement agencies, the general public, and other interested parties.

The rule change does have the potential to generate increased citations for water skiing safety violations, and this in turn may create an increased workload for the political subdivisions of the state that are responsible for the prosecution of this type of misdemeanor violation. An estimate of how many additional citations will be issued, and how large the corresponding workload increase will be to the political subdivisions of the state cannot be determined at this time, since it will be dependent, to a significant degree, on how successful the Department's boater safety education program is in educating the public about the new rule. If there is an increase in citations, a portion of any increased costs to the political subdivisions of the state will be offset by the additional fines collected as a result these citations.

There will be no additional costs and no reductions in revenues to businesses resulting from the proposed rulemaking. There is no anticipated effect on the revenues or payroll expenditures of employers, since there are no businesses that are subject to the proposed rulemaking. No impact on private and public employment in businesses, agencies and political subdivisions of this state is anticipated as a consequence of the proposed rulemaking.

Small businesses are not subject to the proposed rulemaking. The proposed rulemaking involves the competency of the observer of a water skier and does not involve any additional costs or reduction in revenues to small businesses. Additionally, there is no anticipated effect on the revenues or payroll expenditures of employers.

The only other costs associated with the proposed rulemaking will be those resulting from the rulemaking itself. The Department thus anticipates that the benefits from the proposed rulemaking will outweigh the costs to the Department, other agencies, political subdivisions, the general public, private persons, consumers, and any small or large businesses directly affected by the implementation and enforcement of the proposed rulemaking.

**R12-4-525. Watercraft Certificate of Number, Numbers, and Decal Revocation**

Individuals convicted of a felony or misdemeanor offense under A.R.S. § 5-391(F) or (G) will be directly affected by the proposed rulemaking, as will any small and large businesses that sell or rent watercraft if they are involved in the

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

violations. The proposed rulemaking will, at a minimum, affect individual watercraft owned by a person convicted under A.R.S. § 5-391(F) or (G), and for those offenses involving stolen watercraft, all of the watercraft owned by a convicted individual will be impacted. For those violations involving businesses and stolen watercraft, the affect will be significant and may force these businesses to cease operation, which would in turn have an impact on private employment in these businesses.

The revocation of the certificates of number, numbers, and decals does not affect the legal title to or any property rights in the watercraft, and upon application to the Department, the Department shall terminate the revocation and allow the owner to transfer the owner's entire interest in the watercraft if the Department is satisfied that such transfer is proposed in good faith and not for the purpose of defeating the revocation. These provisions are set forth in the proposed new rule and will mitigate the effect of the proposed rulemaking on any businesses involved in convictions by allowing ownership interest in any impacted watercraft to be sold.

Small businesses involved in felony and misdemeanor convictions under A.R.S. § 5-391(F) and (G) are subject to the proposed rulemaking and there are therefore no less costly compliance requirements possible for these businesses. It is likewise not possible to exempt small businesses involved in felony and misdemeanor convictions under A.R.S. § 5-391(F) and (G) from the provisions of the proposed rulemaking.

Departmental enforcement related to the rulemaking will be integrated into existing enforcement responsibilities and current Department operating procedures. Enforcement officers will check for revocation compliance when routinely patrolling the waterways of Arizona. Operating costs to the Department will thus be minimal, associated only with the Administrative Procedures Act requirements under Title 41 and with the dissemination of information regarding the rulemaking to Department personnel, watercraft users, boat dealers, other law enforcement agencies, the general public, and other interested parties.

The general public is the ultimate beneficiary of the proposed rulemaking, which will act as a deterrent to the criminal offenses outlined in A.R.S. § 5-391(H). The Department anticipates that the benefits from the proposed rulemaking will outweigh the costs to the Department, other agencies, political subdivisions, and any members of the general public directly affected by the implementation and enforcement of the proposed rulemaking.

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

No substantive changes were made between the text of the rules contained in the Notice of Proposed Rulemaking published by the Secretary of State in 8 A.A.R. 1780, April 12, 2002 and the text of the rules as finally adopted by the Arizona Game and Fish Commission on May 17, 2002.

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

No public comments were received on the Notice of Proposed Rulemaking.

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

Not applicable

**13. Incorporations by reference and their location in the rules:**

R12-4-520. Arizona Uniform State Waterway Marking System

The Arizona Uniform State Waterway Marking System ~~shall be as is that~~ prescribed in 33 CFR ~~62.66-10~~, revised as of July 1, 1998, 1989, not including any later editions or amendments, which is incorporated by reference in this Section, herein. A copy of the ~~incorporated matter~~ is on file with the Secretary of State and is available from any Department office, or it may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

**14. Were these rules previously adopted as emergency rules?**

No

**15. The full text of the rules follows:**

**TITLE 12. NATURAL RESOURCES**

**CHAPTER 4. GAME AND FISH COMMISSION**

**ARTICLE 5. BOATING AND WATER SPORTS**

Section

- R12-4-501. Boating and Water Sports Definitions
- R12-4-502. Application for Watercraft Registration
- R12-4-503. Renewal of Watercraft Registration
- R12-4-505. Hull Identification Numbers
- R12-4-506. Invalidation of Watercraft Registration
- R12-4-507. Application for Registration of Abandoned or ~~Unreleased~~ Watercraft

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

- R12-4-511. Personal Flotation Devices
- R12-4-512. Fire Extinguishers Required for Watercraft
- R12-4-513. Watercraft Accident and Casualty Reports
- R12-4-517. Watercraft ~~and Boat~~ Motor and Engine Restrictions
- R12-4-520. Arizona Uniform State Waterway Marking System
- R12-4-522. Establishment of Controlled-Use Markers
- R12-4-523. Controlled Operation of Watercraft
- R12-4-524. ~~Reserved~~ Water Skiing
- R12-4-525. ~~Reserved~~ Watercraft Certificate of Number, Numbers, and Decal Revocation

**ARTICLE 5. BOATING AND WATER SPORTS**

**R12-4-501. Boating and Water Sports Definitions**

**A.** In addition to the definitions provided in A.R.S. § 5-301, the following definitions apply to this Article unless the context requires otherwise ~~requires~~:

1. "Aids to navigation" means buoys, beacons, or other fixed objects placed on, in, or near the water to mark obstructions to navigation or to direct navigation through channels or on a safe course.
2. "Bill of sale" means a written agreement transferring ownership, ~~and including:~~ of a watercraft and listing the following: the name of the buyer and seller; the manufacturer of the watercraft sold, if known; the hull identification number, unless exempted by R12-4-505; the purchase price and sales tax paid, if any; and the signature of the seller.
3. "Boats keep out" means that an operator or user of a watercraft, or a person being towed by a watercraft on waterskis, surfboards a surfboard, or similar contrivances device or equipment shall not enter.
4. "Controlled-use marker" means an anchored or fixed marker on the water, shore, or on a bridge that controls the operation of watercraft, water skis, surfboard, or similar ~~contrivances, devices or equipment.~~
5. "Homemade watercraft" means a watercraft ~~which was~~ that is not fabricated or manufactured for resale and to which a manufacturer has not attached a hull identification number. A watercraft assembled from a kit, or constructed from an unfinished manufactured hull, is a "homemade watercraft" if not already assigned a hull identification number by the manufacturer.
6. "Hull identification number" means a number assigned to a specific watercraft by the manufacturer or by a government jurisdiction as prescribed by the U.S. Coast Guard.
7. "Letter of gift" means a document, ~~transferring ownership of a watercraft, signed by the previous owner, stating that the watercraft is a gift and listing~~ and listing the following: the name of both the previous owner and the new owner; the name of the manufacturer of the watercraft if known; ~~and~~ the hull identification number, unless exempted by R12-4-505; a statement that the watercraft is a gift; and the signature of the previous owner.
8. "Livery" means a business authorized to rent watercraft without an operator ~~pursuant to~~ under A.R.S. § 5-371.
9. "No ski" means a person shall not be towed on water skis, an inflatable device, or similar devices equipment.
10. "No wake" means wakeless speed, as defined by A.R.S. § 5-301, and flat wake as referenced in A.R.S. § 5-350.
11. "Owner" in reference to a watercraft means a person who claims lawful possession of a watercraft by virtue of legal title or equitable interest, which entitles that person to possession.
12. "Personal flotation device" means a U. S. Coast Guard approved Type I, II, III, or V wearable, or Type IV throwable device for use on any watercraft, as prescribed by A.R.S. § 5-331(A), (C), and (D); A.R.S. § 5-350(A); and R12-4-511.
- ~~12-13.~~ "Regatta" means an organized water event of limited duration which that affects the use of waterways by the public, which and is conducted according to a prearranged schedule, for which a lawful jurisdiction has issued a permit, but excluding the term does not include fishing tournaments as addressed in A.R.S. § 17-347.
- ~~13-14.~~ "Registered owner" means the person or persons to whom a watercraft is currently registered by any jurisdiction.
- ~~14-15.~~ "Regulatory marker" means a waterway marker placed on, in, or near the water to indicate the presence of a danger or a restricted or controlled-use area or to convey general information and directions.
- ~~15-16.~~ "Sound level" means the noise level measured in decibels on the A-weighted scale of a sound level instrument that conforms with to recognized industry standards and is maintained according to the manufacturer's instructions the requirements set forward by the American National Standards Institute in Specifications for Sound Level Meters.
- ~~16-17.~~ "Staggered registration" means the system of renewing watercraft registrations that expire in accordance with the schedule contained in R12-4-504.
- ~~17-18.~~ "State of principal use" means the state on whose waters the vessel watercraft is used or to be used most during the calendar year.
- ~~18-19.~~ "Use" in reference to a watercraft means any watercraft underway, moored, anchored, or beached on the waterways of the state.
- ~~19-20.~~ "Watercraft" means a boat or other floating device of rigid or inflatable construction designed to carry people or cargo on the water that is propelled by machinery, oars, paddles, or wind action on a sail. Exceptions are sea-planes, makeshift contrivances constructed of innertubes; or other floatable materials which that are not propelled by machin-

ery, personal flotation devices worn or held in hand, and other objects used as floating or swimming aids. ~~For the purpose of registration only, "watercraft" does not include nonmotorized inflatable watercraft which are 12 feet or less in length. Only motorized watercraft are subject to registration.~~

~~20-21.~~ "Watercraft agent" means a person authorized by the Department to collect appropriate fees for the registration and numbering of watercraft.

~~24-22.~~ "Watercraft number" means the registration number issued by the Department under A.R.S. § 5-321.

~~22-23.~~ "Watercraft registration" means the validated certificate of number and validating decals issued by the Department.

**R12-4-502. Application for Watercraft Registration**

- A. A person shall apply for watercraft registration pursuant to under A.R.S. § 5-321 using a form provided by the Department. The applicant shall provide the following information for registration of all watercraft except homemade watercraft, which are addressed in subsection (B):
1. Type of watercraft and propulsion type;
  2. Overall length of ~~craft~~ watercraft;
  3. Manufacturer's name, if known;
  4. Year built or model year, if known;
  5. Hull identification number;
  6. Hull material;
  7. Fuel type;
  8. Category of use;
  9. Watercraft number previously issued for the watercraft, if any;
  10. State of principal use; and
  11. Name, mailing address, and date of birth of each owner. To simplify the description of joint ownership when a watercraft is owned by more than ~~±~~ one person, the applicant shall indicate ownership by use of ~~±~~ one of the following methods:
    - a. Where ownership is joint tenancy with right of survivorship or community property with right of survivorship, the applicant shall use "and/or" between the names of the owners. To transfer registration of the watercraft, each party shall provide a signature if both are living. Upon legal proof of the death of either party, the living party may transfer registration of the watercraft upon the signature of the living party.
    - b. Where ownership is a tenancy in common the applicant shall use "and" between the names of the owners. To transfer registration of the watercraft, each party shall provide a signature. In the event of the death of any party, the interest of the deceased party ~~must shall~~ be handled through ~~probate~~ appropriate legal proceedings.
    - c. Where the ownership is joint tenancy with an express intent that either of the owners ~~have has~~ full authority to transfer registration, the applicant shall use "or" between the names of the owners. ~~As a condition of transferring registration as just indicated above, each~~ Each owner ~~must shall~~ sign the application for registration. To transfer registration, either party's signature is sufficient for transfer.
- B. The owner or owners of a homemade watercraft shall sign the application and have it notarized unless it is signed in the presence of a Department employee. The applicant shall provide the following information for registration of homemade watercraft, using the same ownership designations specified in subsection (A); ~~The owner shall sign the application and have it notarized unless it is signed in the presence of a Department employee.~~
1. Type of watercraft and propulsion type;
  2. Overall length of ~~craft~~ watercraft;
  3. Year built;
  4. Hull material;
  5. Fuel type;
  6. Category of use;
  7. Name, mailing address, and date of birth of each owner;
  8. State of principal use;
  9. Whether the watercraft was assembled from a kit or rebuilt from a factory or manufacturer's hull; and
  10. Hull identification number, if assigned.
- C. In accordance with A.R.S. § 5-321, the applicant shall submit with the application for registration a receipt for use tax paid from the Arizona Department of Revenue unless at least one of the following applies:
1. The applicant is exempt from use tax as provided in 15 A.A.C. 5~~7~~~~0~~~~1~~;
  2. The applicant is transferring the watercraft from another jurisdiction to Arizona without changing ownership; ~~or~~
  3. Sales or use tax paid is shown on the bill of sale or receipt submitted by the applicant; ~~or~~
  4. The applicant submits a notarized affidavit of exemption stating that the acquisition of the watercraft was for rental or resale purposes.
- D. To obtain registration as a commercial watercraft under A.R.S. § 5-322(H), the owner shall provide evidence of payment of the *ad valorem* property tax under the provisions of Article 9, Section 16 of the Arizona Constitution; the tax privilege license number; and the business name, address, and telephone number.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

- E.** To obtain watercraft dealer registration under A.R.S. § 5-322(G), the applicant shall be a business offering watercraft for sale, or a watercraft manufacturer registered by the U.S. Coast Guard. ~~The applicant shall provide the following information on a form available from the Department. A person shall display dealer numbers for demonstration purposes only. "Demonstration" means to operate a watercraft on the water for the purpose of selling, trading, negotiating, or attempting to negotiate the sale or exchange of interest in new watercraft. Demonstration also includes operation by a manufacturer for purposes of testing a watercraft. Demonstration does not include operation of a watercraft for personal purposes by a dealer or manufacturer, employee of a dealer or manufacturer, family member of a dealer or manufacturer, or an associate of a dealer or manufacturer.~~ The Department shall issue the number of certificates and decals specified on the application, or deny issuance; within 30 calendar days of receiving the application. The applicant shall provide the following information on a form available from the Department:
1. All business names used for the sale or manufacture of watercraft in Arizona, and the mailing address and telephone number for each business to be issued watercraft dealer registrations;
  2. Tax privilege license number;
  3. U.S. Coast Guard manufacturer identification code, if applicable;
  4. ~~Total~~ The total number of certificates of number and decals to be issued; ~~and~~
  5. Name, address, signature, and phone number of the owner or manager of the principal business.
- F.** ~~An applicant registering a watercraft which has never previously been registered by any jurisdiction shall submit the following:~~
- ~~1. A bill of sale.~~
  - ~~2. A letter of gift, if the watercraft was acquired as a gift instead of by purchase. The previous owner shall state in the letter of gift that the watercraft was never previously registered; or~~
  - ~~3. Watercraft may be registered without either a bill of sale or a letter of gift or compliance with R12-4-507 only if the owner submits a form either notarized or signed in the presence of a Department employee, attesting to subsection (3)(a), (b), or (c) below:~~
    - ~~a. That the watercraft was manufactured prior to 1972, that it is 12 feet or less in length, and that it is not propelled by machinery other than an outboard engine; or~~
    - ~~b. That the watercraft was previously owned by the applicant in a state that required neither registration nor titling; or~~
    - ~~c. That the watercraft was previously owned by the applicant in a state that did require registration and titling, but that the applicant did not register or title the watercraft because the watercraft was not used; and~~
    - ~~d. The applicant shall provide all of the following on the form:~~
      - ~~i. Full name and mailing address of each owner;~~
      - ~~ii. Type of watercraft and propulsion type;~~
      - ~~iii. Overall length of craft;~~
      - ~~iv. Manufacturer's name, if known;~~
      - ~~v. Year built or model year, if known;~~
      - ~~vi. Hull identification number, unless exempted by R12-4-505;~~
      - ~~vii. Hull material;~~
      - ~~viii. Fuel type;~~
      - ~~ix. Horsepower of engine, if any.~~
- E.** In addition to submitting the application form and any other information required by this Section, the applicant for watercraft registration shall submit one of the following additional forms of documentation:
1. An original title if the watercraft is titled in another state, and a release of interest if the watercraft is being transferred to an individual other than the original listed owner;
  2. An original registration if the watercraft is from a registration state, and a release of interest if the watercraft is being transferred to an individual other than the original listed owner;
  3. A bill of sale as defined in R12-4-501 if the watercraft has never been registered or titled in any state;
  4. A letter of gift as defined in R12-4-501 if the watercraft was received as a gift and was never registered or titled in another state;
  5. A court order or other legal documentation establishing lawful transfer of ownership; or
  6. A statement of fact form available from any Department office if none of the documentation identified in subsections (F)(1) through (F)(5) exists, either in the possession of the watercraft owner or in the records of any jurisdiction responsible for registering or titling watercraft. The owner or owners of the watercraft shall sign the statement of fact form and shall have it notarized unless it is signed in the presence of an authorized Department employee. The owner or owners of the watercraft shall provide the hull identification number of the watercraft on the statement of fact form and shall certify one of the following:
    - a. The watercraft was manufactured prior to 1972, is 12 feet in length or less, and is not propelled by an inboard engine;
    - b. The watercraft is owned by the applicant, and it has never been registered or titled;



*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

~~K.L.~~ A person shall not apply for or obtain a watercraft registration by making a false statement or providing false information on any application, statement of fact, or written instrument submitted to the Department. The Department shall provide notice that a watercraft registration is invalid if the registration is obtained by an applicant who makes a false statement or provides false information on any application, statement of fact, or written instrument submitted to the Department, and as prescribed in R12-4-506.

~~L.I.~~ The Department shall issue a watercraft registration within 30 calendar days of receiving a valid application and documentation as required by this rule, Section, whether from the applicant or from a watercraft agent pursuant to under R12-4-509. An application is not considered valid if the Department receives legal documentation that legal action may affect ownership of the watercraft.

~~M.K.~~ All watercraft registrations and supporting documentation are subject to verification by the Department and to the requirements of R12-4-505. The Department ~~may shall~~ require a watercraft to be presented for inspection to verify the information provided by an applicant. ~~See R12-4-506: if the Department has reason to believe that the information provided by the applicant is inaccurate or false.~~

**R12-4-503. Renewal of Watercraft Registration**

A. The Department shall mail renewal notices to the address of the watercraft owner, as shown on the certificate of number, ~~6 six weeks prior to before~~ the last day of the month of expiration established under R12-4-504. ~~It is the responsibility of the The owner to of a watercraft shall~~ ensure that renewal is achieved the watercraft's registration is renewed regardless of whether or not the renewal notice is received.

B. ~~In order to~~ To renew a watercraft's registration in person or by mail, the an applicant shall submit the registration fee required by A.R.S. ~~Title 5, Chapter 3, § 5-321~~ and the renewal notice provided by the Department. In the absence of the renewal notice, the registered owner shall present ~~+~~ one of the following:

1. ~~Current A current~~ prior certificate of number;
  2. A valid driver's license;
  3. A valid Arizona Motor Vehicle Division identification card; or
  4. A valid passport.
2. ~~One of the following:~~
- a. ~~Valid driver's license;~~
  - b. ~~Valid Arizona Motor Vehicle Division identification card;~~
  - e. ~~Passport.~~

C. To renew a watercraft's registration by telecommunications, an applicant shall pay the registration fee required by A.R.S. § 5-321 and shall provide either of the following to the Department or its agent:

1. The name and address of the watercraft's registered owner as it appears on the renewal notice, and
2. The assigned Arizona watercraft number (AZ number) of the watercraft being renewed, or
3. The Department-assigned identification number or password.

~~C.D.~~ The Department or its agent shall renew ~~watercraft a watercraft's~~ registration within 30 calendar days of receiving ~~the a~~ valid application for renewal. The Department shall mail the renewal to the address of record unless the applicant ~~has achieved renewal~~ renews the watercraft's registration in person, or unless there is a notarized request from the registered owner to mail it to another address.

**R12-4-505. Hull Identification Numbers**

A. The Department shall not register a watercraft without a hull identification number.

B. The Department shall assign a hull identification number to a watercraft with a missing ~~or improper~~ hull identification number only when if the Department determines that:

1. A hull identification number has not been ~~fraudulently~~ illegally removed or altered, unless the application is made by a governmental agency and is accompanied by an order of forfeiture or order of seizure or other civil process; or
2. The missing ~~or improper~~ hull identification number was caused by error of the manufacturer or a government jurisdiction or failure of a previous owner of a watercraft to comply with this rule, or because the watercraft is a "home-made watercraft" as defined in R12-4-501.

C. The Department shall assign or deny assignment of a hull identification number within 30 days of receipt of a valid application, as described in R12-4-502.

D. The Department shall accept a bill of sale presented with a missing or improper hull identification number for registration purposes only if:

1. It matches the improper hull identification number or ~~lack of~~ there is no hull identification number on the watercraft; or
2. A hull identification number is issued by the Department under subsection (B).

E. The applicant or the Department shall affix the hull identification number as follows:

1. On watercraft with transoms, affix the hull identification number to the right or starboard side of the transom within 2 two inches of the top of the transom or hull/deck joint, whichever is ~~lowest~~ lower.

Notices of Final Rulemaking

2. On watercraft without ~~transoms, a transom,~~ affix the hull identification number to the starboard outboard side of the hull, back or aft within  $\pm$  one foot of the stern and within  $\pm$  two inches of the top of the hull, gunwale, or hull/deck joint, whichever is lowest.
3. On ~~eatamarans and a catamaran or pontoon boats~~ boat, affix the hull identification number on the aft crossbeam within  $\pm$  one foot of the starboard hull attachment.
4. If the hull identification number would not be visible because of rails, fittings, or other accessories, affix it as ~~close~~ as close as possible in the manner to the applicable location prescribed in subsection (E)(1).
5. Affix a duplicate of the visibly affixed hull identification number in an unexposed location on a permanent part of the hull.
6. ~~Each~~ Burn, carve, stamp, emboss, mold, bond, or otherwise permanently affix each hull identification number ~~is to be burned, carved, stamped, embossed, molded, bonded, or otherwise permanently affixed~~ to a non-removable part of the watercraft so that alteration, removal, or replacement ~~would~~ will be obvious.
7. ~~The~~ Ensure that the characters of each hull identification number affixed to the watercraft ~~are to be~~ are no less than 1/4 inch in height.

**R12-4-506. Invalidation of Watercraft Registration**

- A. Any watercraft registration obtained by fraud or misrepresentation ~~shall be~~ is invalid from the date of issuance, ~~thereof~~.
- B. A certificate of number and any decals issued ~~shall be~~ are invalid ~~when~~ if any of the following occurs:
  1. Any check, money order, or other currency certificate presented to the Department for payment of watercraft registration or renewal is found to be non-negotiable;
  2. Any person whose name appears on the certificate of number loses ownership of the watercraft by legal process;
  3. ~~When~~ Arizona is no longer the state of principal use;
  4. The watercraft is documented by the U.S. Coast Guard;
  5. An applicant provides incomplete or incorrect information to the Department and fails to provide the correct information within 30 days after a request by the Department; or
  6. The Department revokes the certificate of number, numbers, and decals as provided in A.R.S. § 5-391(H).
- C. ~~Certificates~~ A person shall return the certificate of number and decals that are invalid pursuant to ~~under~~ subsections (A) and or (B)(4) ~~shall be returned~~ to the Department within 15 calendar days of receiving written notification from the Department that ~~they~~ the certificate of number and decals are invalid.
- D. The Department shall not validate or renew an invalid watercraft registration until the reason for invalidity has been corrected or no longer exists.

**R12-4-507. Application for Registration of Abandoned or ~~Unreleased~~ Watercraft**

- A. For the purpose of this ~~rule, Section~~ the following definitions ~~shall~~ apply unless the context otherwise requires:
  1. "Abandoned watercraft" means a watercraft ~~which that has been~~ is deserted on a highway, a public street, or on public or private property or waters. A watercraft left under a written ~~or verbal~~ repair or storage order is not an abandoned watercraft.
  2. "Release of interest" means a statement giving up, surrendering, or abandoning unconditionally any claim or right of ownership or use in a watercraft.
  2. ~~"Unreleased watercraft" means there is no release of interest from the registered owner of the watercraft.~~
- B. Unless an abandoned watercraft ~~has been~~ is reported stolen, ~~the abandonment constitutes an assumption that~~ the last registered owner is presumed to be responsible for the abandonment of the watercraft.
- C. ~~The~~ An applicant seeking registration of an abandoned watercraft shall submit the following information, ~~when~~ if available, on a form ~~available~~ obtained from the Department:
  1. Hull identification number, unless exempted by R12-4-505;
  2. Registration number;
  3. Decal number;
  4. State of registration;
  5. Year of registration;
  6. Name, address, and daytime ~~phone~~ telephone number of the person who found the watercraft;
  7. Description or address of the location where the watercraft was found;
  8. Whether there is any known written ~~or verbal~~ agreement for storage or repair;
  9. Condition of the watercraft; whether wrecked, stripped, or intact; and
  10. State in which the watercraft will be used.
- D. ~~The Department shall attempt to determine the name and address of the registered owner and, if successful, shall send written notice of the attempt to register the watercraft by the applicant to the registered owner by certified mail, return receipt requested. Within 45 calendar days of receiving the form required by subsection (C), the Department shall advise the applicant in writing of the results, in accordance with the following:~~
  1. ~~If the registered owner provides written release of interest in the watercraft, the Department shall provide the applicant with the release and the applicant may then register the watercraft pursuant to R12-4-502.~~

2. ~~If the registered owner declines to release interest in the watercraft, the Department shall so advise the applicant, and the Department shall not register the watercraft to the applicant unless the applicant proves ownership by other legal remedy and complies with R12-4-502.~~
3. ~~If the Department cannot determine who is the registered owner of the watercraft, or if the written notice returns unclaimed, or if a period of 21 calendar days from the date of mailing passes without response from the registered owner, the Department shall advise the applicant of failure to contact the registered owner.~~

**D.** The Department shall attempt to determine the name and address of the registered owner and, if successful, shall send written notice of the attempt to register the watercraft by the applicant to the registered owner by certified mail, return receipt requested.

1. After 30 calendar days from the date the Department mails the notice, if service is successful, or upon receipt of a response from the registered owner, the Department shall advise the applicant in writing according to the following:
  - a. If the registered owner provides a written release of interest in the watercraft, the Department shall provide the applicant with the release and the applicant may then register the watercraft under R12-4-502.
  - b. If the registered owner provides written notice to the Department refusing to release an interest in the watercraft, the Department shall advise the applicant of the refusal, and the Department shall not register the watercraft to the applicant unless the applicant provides proof of ownership and complies with R12-4-502.
  - c. If the registered owner does not respond to the notice in writing within 30 days from the date of mailing, when service was successful, the Department shall advise the applicant of the failure to respond, and the Department shall not register the watercraft to the applicant unless the applicant provides proof of ownership and complies with R12-4-502.
2. If the Department cannot determine who the registered owner of the watercraft is, or if the written notice is returned unclaimed or refused, the Department shall advise the applicant in writing within 15 days of the notice being returned that the attempt to identify or contact the registered owner was unsuccessful.

**E.** ~~In order to~~ To register the watercraft when if the Department has failed to ~~is unsuccessful in its attempt to identify or contact the registered owner pursuant to~~ under subsection (D), the applicant shall:

1. Advertise twice, two weeks apart, ensuring that the second advertisement is published at least two weeks after the first advertisement, in a newspaper of statewide general circulation, in the state; if If the watercraft is traceable to another state's registration, the applicant shall also advertise in the same manner in a newspaper of statewide general circulation in the state of registration. The applicant shall ensure that the advertised notice shall include includes a complete description of the watercraft, including any identifying numbers, the date and location of the watercraft's finding, where the watercraft was found, the present location of the watercraft, and the means by which the applicant can be contacted, and a statement that the owner shall contact the Department or risk losing ownership of the watercraft. The applicant shall also ensure that the notice shall also include a statement that the includes the following warning: watercraft will the Department shall be registered register the watercraft to the applicant by the Arizona Game and Fish Department if no other person can prove provides proof of ownership.
2. Thirty calendar days after the second newspaper advertisement, the applicant shall submit proof to the Department an affidavit of publication pursuant to under this rule to the Department Section and shall follow, in addition to following the application procedures prescribed in R12-4-502, unless the Department or the applicant receives notice from the registered owner refusing to release interest in the watercraft.

#### **R12-4-511. Personal Flotation Devices**

**A.** ~~The operator of a canoe, kayak, or other watercraft that is less than 16 feet in length shall ensure that the canoe, kayak, or other watercraft is equipped with at least + one appropriately-sized, U.S. Coast Guard-approved, wearable personal flotation device that is in good and serviceable condition for each person on board the canoe, kayak, or other watercraft. The operator of a canoe, kayak, or other watercraft shall also ensure that the wearable personal flotation devices on board the canoe, kayak, or other watercraft are readily accessible and available for immediate use.~~ The following wearable personal flotation devices are approved by the U.S. Coast Guard:

1. ~~Type I Personal Flotation Device: off-shore life jacket,;~~
2. ~~Type II Personal Flotation Device: near-shore buoyant buoyancy vest,;~~
3. ~~Type III Personal Flotation Device: flotation aid,; and~~
4. ~~Type V Special Use Device.~~

**B.** ~~No person may use~~ In addition to the personal flotation devices prescribed in subsection (A), the operator of a watercraft that is 16 feet or more in length, except a canoe or kayak, shall ensure that the watercraft unless it is also equipped with a U.S. Coast Guard-approved buoyant cushion, or ring life buoy, or horseshoe buoy (Type IV Personal Flotation Device). Such watercraft shall also be equipped with at least 1 of the following U.S. Coast Guard-approved wearable personal flotation devices of appropriate size for each person on board:

1. ~~Type I Personal Flotation Device: off-shore life jacket,;~~
2. ~~Type II Personal Flotation Device: near-shore buoyant vest, and;~~
3. ~~Type III Personal Flotation Device: flotation aid.~~

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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- ~~C.~~ Before May 1, 1996, a Type IV personal flotation device may be carried on a canoe, kayak, or other watercraft that is less than 16 feet in length for use by persons on board if the canoe, kayak, or other watercraft is:
  - 1. Leased or rented to another for the latter's pleasure as part of a livery or rental business;
  - 2. Manually propelled; and
  - 3. Less than 16 feet.
- ~~D.~~ This rule is effective January 1, 1996.
- C. Persons on board a watercraft or personal watercraft shall wear an appropriately-sized, U.S. Coast Guard-approved personal flotation device as prescribed in A.R.S. § 5-331(C) and A.R.S. § 5-350(A).
- D. For the purpose of this Section, "wear" means that the personal flotation device is being worn according to the manufacturer's design or recommended use; that all closures of the personal flotation device are fastened, snapped, tied, zipped, or secured according to the manufacturer's design or recommended use; and that the personal flotation device is adjusted for a snug fit.
- E. Subsections (A), (B), and (C) do not apply to the operation of a racing shell or rowing skull during competitive racing or supervised training, if the racing shell or rowing skull is manually propelled, recognized by a national or international association for use in competitive racing, and designed to carry and does carry only equipment used solely for competitive racing.

**R12-4-512. Fire Extinguishers Required for Watercraft**

- ~~A.~~ Pursuant to A.R.S. § 5-332(B) and as prescribed by the U.S. Coast Guard, all Class 2 watercraft (26 feet to less than 40 feet) shall carry on board the following equipment as designated and approved by the United States Coast Guard:
  - 1. At least two B-I type hand portable fire extinguishers or at least one B-II type hand portable fire extinguisher.
  - 2. When a fixed fire extinguishing system is installed in the machinery space, there shall be on board at least one B-I type approved hand portable fire extinguisher.
- ~~B.~~ Pursuant to A.R.S. § 5-332(B) and as prescribed by the U.S. Coast Guard, all Class 3 watercraft (40 feet to not more than 65 feet) shall carry on board the following equipment as designated and approved by the United States Coast Guard:
  - 1. At least three B-I type hand portable fire extinguishers or at least one B-I plus one B-II type hand portable fire extinguishers.
  - 2. When a fixed fire extinguishing system is installed in the machinery space, there shall be on board at least two B-I type hand portable fire extinguishers or at least one B-II type hand portable fire extinguisher.
- ~~C.~~ Watercraft less than 26 feet in length shall be required to carry one B-I type fire extinguisher on board only if one or more of the following conditions exist:
  - 1. Inboard engine.
  - 2. Closed compartments under thwarts and seats where portable fuel tanks may be stored.
  - 3. Double bottoms not sealed to the hull or which are not completely filled with flotation materials.
  - 4. Closed living spaces.
  - 5. Closed stowage compartments in which combustible or flammable materials are stored.
  - 6. Permanently installed fuel tanks. Fuel tanks secured so they cannot be moved in case of fire or other emergency shall be considered permanently installed.
- A. Under A.R.S. § 5-332, an operator of a watercraft less than 26 feet in length shall carry one U.S. Coast Guard-approved B-I type fire extinguisher on board if the watercraft has one or more of the following:
  - 1. An inboard engine.
  - 2. Closed compartments where portable fuel tanks may be stored.
  - 3. Double bottoms not sealed to the hull or which are not completely filled with flotation materials.
  - 4. Closed living spaces.
  - 5. Closed stowage compartments in which combustible or flammable materials are stored.
  - 6. Permanently installed fuel tanks (fuel tanks secured so that they cannot be moved in case of fire or other emergency are considered permanently installed), and
  - 7. A fixed fire extinguishing system installed in the engine compartment.
- B. Under A.R.S. § 5-332, an operator of a Class 2 watercraft (26 feet to less than 40 feet) shall carry on board the following equipment as designated and approved by the U. S. Coast Guard:
  - 1. At least two B-I type hand-portable fire extinguishers or at least one B-II type hand-portable fire extinguisher, or
  - 2. At least one B-I type approved hand-portable fire extinguisher if a fixed fire extinguishing system is installed in the engine compartment.
- C. Under A.R.S. § 5-332, an operator of a Class 3 watercraft (40 feet to not more than 65 feet) shall carry on board the following equipment as designated and approved by the U. S. Coast Guard:
  - 1. At least three B-I type hand-portable fire extinguishers or at least one B-I and one B-II type hand-portable fire extinguishers, or
  - 2. At least two B-I type hand-portable fire extinguishers or at least one B-II type hand-portable fire extinguisher when a fixed fire extinguishing system is installed in the engine compartment.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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**R12-4-513. Watercraft Accident and Casualty Reports**

- A. The operator or owner of ~~any a~~ watercraft involved in any collision, accident or other casualty that results in injury or death shall submit the report required by A.R.S. § 5-349 on a form provided by the Department. ~~The form shall be completed in full. Information~~ The operator or owner of a watercraft involved in any collision or accident that results in property damage only shall submit the report required by A.R.S. § 5-349, on a form provided by the Department, only if the property damage exceeds \$500. The operator or owner of the watercraft submitting the report required by A.R.S. § 5-349 shall complete the form provided by the Department in full, and shall clearly identify on the form any information that is not applicable or that is unknown, shall be so marked. The following information shall be provided The operator or owner of the watercraft submitting the report required by A.R.S. § 5-349 shall provide the following information on the form provided by the Department:
1. The operator's name, address, date of birth, ~~sex,~~ gender, and telephone number;
  2. The owner's name, address, date of birth, and telephone number;
  3. The operator's hours of experience in operating watercraft;
  4. ~~Boat~~ The operator's amount of boating safety instruction;
  5. Information on the watercraft involved:
    - a. Type of ~~boat,~~ watercraft, make, and model;
    - b. ~~Boat~~ Watercraft propulsion and year built;
    - c. ~~Boat~~ Watercraft construction and year built;
    - d. Hull material;
    - e. Hull identification number; and
    - f. State registration number;
  6. Information on the accident:
    - a. Date and time;
    - b. General and specific location;
    - c. Type of operation at time of accident;
    - d. Type of accident;
    - e. Weather, water conditions, wind, visibility, and estimated temperature at the time of accident; and
    - f. Cause of accident;
  7. Estimated cost of damage to the watercraft;
  8. Whether the watercraft ~~was sunk~~ sank, and if so, whether recovered, and the name, address, and telephone number of the person who made recovery;
  9. Whether the ~~boat~~ watercraft was adequately equipped with U.S. Coast Guard-approved personal flotation devices, whether they were accessible, and whether they were used:
    - a. ~~Whether they were accessible;~~
    - b. ~~Whether they were used;~~
  10. Whether fire extinguishers were used, and the types and number of fire extinguishers used;
  11. Information on operators and owners of each of the other watercraft involved in the accident: name, address, telephone number, and watercraft registration number;
  12. Information on persons killed or injured in the accident: name, address, date of birth, cause of death or nature of injury, and the name and location of the receiving hospital;
  13. The name, address, date of birth, and telephone number of all passengers in the watercraft;
  14. The location of passengers, skiers, and swimmers at the time of the accident;
  15. If there was damage to property other than any of the watercraft involved:
    - a. Name, address, and telephone number of owner;
    - b. Description of damage; and
    - c. Estimated cost of damage;
  16. The name, address, and telephone number of any witnesses other than passengers;
  17. A diagram and narrative explaining the accident.
- B. ~~The person~~ Any person filling out the form shall sign the form; designate whether ~~they are~~ the person is the owner, operator, or any other party; and provide ~~their~~ name, address, telephone number, and the date the form ~~was~~ is submitted to the Department.

**Notices of Final Rulemaking**

**R12-4-517. Watercraft ~~and Boat~~ Motor and Engine Restrictions**

A. Persons ~~A person~~ operating ~~motor power boats~~ a motorized watercraft on the following waters shall use ~~a single an~~ electric ~~trolling~~ motor only:

|                        |                                |                                   |
|------------------------|--------------------------------|-----------------------------------|
| <u>Ackre Lake</u>      | Granite Basin Lake             | Rucker Canyon Lake                |
| Arivaca Lake           | <u>Hulsey Lake</u>             | Santa Fe Lake                     |
| Bear Canyon Lake       | <u>Horsethief Basin Lake</u>   | Scott's Reservoir                 |
| <del>Becker Lake</del> | J.D. Lake                      | Sierra Blanca Lake                |
| Black Canyon Lake      | Knoll Lake                     | Soldier Lake (in Coconino County) |
| Bunch Reservoir        | Lee Valley Lake                | Stehr Lake                        |
| <u>Carnero Lake</u>    | <del>Lower Lake Pleasant</del> | Stoneman Lake                     |
| Chaparral Lake         | Lynx Lake                      | Tunnel Reservoir                  |
| Cluff Ponds            | McKellips Park Lake            | Whitehorse Lake                   |
| Coconino Reservoir     | <del>Nelson Reservoir</del>    | <u>Willow Lake</u>                |
| <del>Concho Lake</del> | Pena Blanca Lake               | Woodland Reservoir                |
| Coors Lake             | <u>Pratt Lake</u>              | Woods Canyon Lake                 |
| Dankwork Pond          | <u>Quigley Lake</u>            |                                   |
| Dogtown Reservoir      | <u>Redondo Lake</u>            |                                   |
| <u>Fortuna Lake</u>    | Riggs Flat Lake                |                                   |
| <u>Goldwater Lake</u>  | <del>River Reservoir</del>     |                                   |
|                        | Roper Lake                     |                                   |

B. Persons ~~A person~~ operating ~~power boats~~ a motorized watercraft on the following waters shall use only a single electric ~~trolling~~ motor or a single gasoline ~~motor~~ engine not exceeding ~~8~~ 10 manufacturer-rated horsepower:

|                      |                           |   |
|----------------------|---------------------------|---|
| Ashurst Lake         | Cholla Lake Hot Pond      | Luna Lake                                     |
| <u>Becker Lake</u>   | Crescent Lake             | <u>Mexican Hay Lake</u>                       |
| Big Lake             | Fool Hollow Lake          | <u>Nelson Reservoir</u>                       |
| Blue Ridge Reservoir | Kaibab Lake               | Parker Canyon Lake                            |
| Cataract Lake        | Kinnikinick Lake          | Rainbow Lake                                  |
| Chevelon Canyon Lake | <u>Little Mormon Lake</u> | <u>River Reservoir</u>                        |
| <u>Concho Lake</u>   |                           | Show Low Lake                                 |
|                      |                           | Willow Springs Lake                           |
|                      |                           | <u>Whipple Lake</u>                           |
|                      |                           | <u>White Mountain Lake (in Apache County)</u> |

- C. Persons ~~A person~~ shall not operate ~~a~~ watercraft on Frye Mesa Reservoir, Rose Canyon Lake, ~~and~~ or Snow Flat Lake.
- D. This rule does not apply to ~~boats~~ watercraft of governmental agencies or to Department-approved emergency standby ~~boats~~ watercraft operated by lake concessionaires ~~when~~ if operating to address public safety or public welfare.

**R12-4-520. Arizona Uniform State Waterway Marking System**

The Arizona Uniform State Waterway Marking System ~~shall be as is that~~ prescribed in 33 CFR ~~66.10, 62,~~ revised ~~as of~~ July 1, 1989, 1998, not including any later ~~editions or~~ amendments, which is incorporated by reference ~~herein, in this Section.~~ A copy ~~of the incorporated matter~~ is on file with the Secretary of State and is available from any Department office, or it may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

**R12-4-522. Establishment of Controlled-Use Markers**

- A. Any agency or person may control the operation of watercraft, water skis, surfboards or similar contrivances on waters ~~within their lawful jurisdiction by establishing controlled use markers pursuant to the following requirements. When such~~ If a lawful jurisdiction has not exercised its authority to control watercraft under A.R.S. § 5-361, or ~~when~~ if waters are directly under the jurisdiction of the Commission, the Department ~~may~~ has the authority to control watercraft within that jurisdiction in accordance with the following requirements:
- ~~Controlled~~ The Department shall place controlled-use markers ~~shall be placed~~ only where controlled operation of watercraft is necessary to protect life, property, or habitat, and ~~may be moved or removed~~ shall move or remove the markers only when if the need for ~~such the~~ protection ~~has changed~~ changes.
  - ~~Restrictions~~ The Department shall ensure that restrictions imposed ~~shall be~~ are clearly communicated to the public as prescribed by rule or by wording on the markers.
- B. A governmental agency, excluding federal agencies ~~having~~ with jurisdiction over federal navigable waterways, shall report to the Department ~~when if~~ controlled-use markers have been placed and ~~shall~~ include in that report the type, purpose, and placement of markers, and whether the markers are expected to be permanent or temporary; the governmental

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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agency shall also advise the Department of the removal of controlled-use markers. The report shall be made within 30 days of establishment or removal of controlled-use markers. ~~No~~ A report is not required for establishment or removal of markers for ~~a period of~~ less than 30 days.

- C. Any person or government agency may request establishment, change, or removal of controlled-use markers on waters under the jurisdiction of the Commission or on waters not under the jurisdiction of another agency by submitting the reasons for the request to the Director of the Arizona Game and Fish Department, who shall either accept or deny the request within 60 days of receipt. A person may appeal the Director's denial of a request to the Commission ~~pursuant to R12-4-608:~~ as an appealable agency action under A.R.S. Title 41, Chapter 6, Article 10.

**R12-4-523. Controlled Operation of Watercraft**

- A. ~~No~~ A person shall not operate any watercraft, ~~water ski, surfboard~~ or use any watercraft to tow a person on waterskis, a surfboard, inflatable device, or similar ~~contrivance~~ object, device or equipment in a manner contrary to the area restrictions imposed by lawfully ~~established~~ placed controlled-use markers, except for:
1. Law enforcement officers acting within the scope of their lawful duties;
  2. Persons involved in rescue operations;
  3. Persons engaged in government-authorized activities; and
  4. ~~When a permit has been issued by the authority having lawful jurisdiction for a regatta which is to take place within a controlled area during the time limits of the event~~ Persons participating in a regatta, during the time limits of the event only.
- B. The exemptions listed in subsection (A) ~~shall do~~ not authorize any person to operate a watercraft in a careless, negligent, or reckless manner as ~~stated~~ prescribed in A.R.S. § 5-341. ~~See also R12-4-517.~~

**R12-4-524. Reserved Water Skiing**

An operator of a watercraft shall ensure that the observer of a water skier is physically capable and mentally competent to act as an observer.

**R12-4-525. Reserved Watercraft Certificate of Number, Numbers, and Decal Revocation**

- A. For the purposes of this Section, "person" has same meaning as prescribed in A.R.S. § 5-301(8).
- B. Upon notice of conviction of a person under A.R.S. § 5-391(F), the Department shall revoke for a period not to exceed two years the certificates of number, numbers, and decals of any Arizona registered watercraft involved in the violation that the convicted person owns. If the conviction under A.R.S. § 5-391(F) involves stolen watercraft, the Department shall revoke for a period not to exceed two years the certificates of number, numbers, and decals of any Arizona registered watercraft that the convicted person owns.
- C. Upon notice of conviction of a person under A.R.S. § 5-391(G), the Department shall revoke for a period not to exceed one year the certificates of number, numbers, and decals for any Arizona registered watercraft involved in the violation that the convicted person owns.
- D. Upon receiving notice of conviction, the Department shall serve notice under A.R.S. §§ 41-1092.03 and 41-1092.04 on the person convicted that the certificates of number, numbers, and decals of watercraft the person owns are subject to revocation.
- E. A person whose certificates of number, numbers, and decals are subject to revocation may request a hearing. The person shall submit a written request to the Arizona Game and Fish Department, Director's Office, 2221 W. Greenway Rd., Phoenix, AZ 85023, within 15 calendar days of receiving the notice provided in subsection (D).
- F. If the person requests a hearing, the Department shall, within 30 days of receiving the request, schedule a hearing before the Director or request, in accordance with A.R.S. § 41-1092.05, that the Office of Administrative Hearings schedule a hearing.
- G. After a final decision to revoke, the Department shall serve upon the person an Order of Revocation. Within 15 calendar days of receipt of the notice, the person shall surrender to the Department the revoked certificates of number and decals.
- H. The revocation of the certificates of number, numbers, and decals does not affect the legal title to or any property rights in the watercraft. Upon application to the Department, the Department shall terminate the revocation and allow the owner to transfer the owner's entire interest in the watercraft if the Department is satisfied that the transfer is proposed in good faith and not for the purpose of defeating the revocation.

*Editor's Note and Disclaimer: The following Notice of Final Rulemaking contained numerous inconsistencies between the paper copy approved by the Governor's Regulatory Review Council and the electronic version used by the Office of the Secretary of State to prepare the notice for publication. Because of the volume and complexity of the inconsistencies, the size of the notice, and the Office's publishing time constraints, the Office publishes the notice here with the understanding that it may not be entirely accurate.*

## NOTICE OF FINAL RULEMAKING

### TITLE 18. ENVIRONMENTAL QUALITY

#### CHAPTER 4. DEPARTMENT OF ENVIRONMENTAL QUALITY

##### SAFE DRINKING WATER

###### PREAMBLE

**1. Sections Affected**

R18-4-101  
R18-4-103  
R18-4-104  
R18-4-105  
R18-4-105.01  
Appendix A  
Appendix A  
R18-4-210  
R18-4-214  
R18-4-214.01  
R18-4-214.02  
R18-4-220  
R18-4-301  
R18-4-301.02  
R18-4-302  
R18-4-303  
R18-4-403  
R18-4-703  
R18-4-704  
R18-4-706  
R18-4-709  
Appendix A  
Appendix B  
Appendix C

**Rulemaking Action**

Amend  
Amend  
Amend  
Amend  
New Section  
Repeal  
New Section  
Amend  
Amend  
New Section  
New Section  
Amend  
Amend  
New Section  
Amend  
Amend  
New Section  
Amend  
Amend  
Amend  
Amend  
Repeal  
Repeal  
Repeal

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

Authorizing statutes: A.R.S. §§ 49-104, 49-202, 49-203, 49-351, 49-352, 49-353, and 49-353.01

Implementing statutes: A.R.S. §§ 49-203, 49-351, 49-352, 49-353, and 49-353.01

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

May 1, 2002

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

Notice of Rulemaking Docket Opening: 7 A.A.R. 3491, August 10, 2001

Notice of Proposed Rulemaking: 7 A.A.R. 3892, September 7, 2001

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

Name: Jeffrey W. Stuck, Manager, Drinking Water Section, or  
Nina Miller, Primacy Coordinator, Drinking Water Section

Address: Arizona Department of Environmental Quality  
3033 N. Central Avenue (M0248A)  
Phoenix, AZ 85012-2809

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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Telephone and E-mail: Jeff Stuck, (602) 207-4617, jws@ev.state.az.us  
Nina Miller, (602) 207-4641, nem@ev.state.az.us  
(In Arizona: call (800) 234-5677 and ask for the four-digit extension.)

Fax: (602) 207-4634

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

A. Background for Rulemaking

The Arizona Department of Environmental Quality (ADEQ) has been granted primacy by the U.S. Environmental Protection Agency (EPA) for purposes of enforcement of the federal Safe Drinking Water Act and related regulations in Arizona. To maintain primacy, ADEQ must adopt rules that are no less stringent than the National Primary Drinking Water Regulations (NPDWRs). ADEQ has reviewed the Arizona drinking water rules at 18 A.A.C. 4, and determined that revisions need to be made to the rules in order for ADEQ to maintain primacy. The proposed revisions are for the purpose of adopting three final regulations promulgated by the EPA: 1) Public Notification Rule, 2) Interim Enhanced Surface Water Treatment Rule, and 3) Stage 1 Disinfectants and Disinfection Byproducts Rule. Summaries of the changes to the rules follow.

On May 4, 2000, the EPA published final regulations to revise the general public notification requirements for public water systems in the NPDWRs. On May 4, 2000, EPA also published revisions to the Consumer Confidence Report rule to be consistent with the final public notification rule. Public notification of violations is an integral part of the public health protection and consumer right-to-know provisions of the 1996 amendments and set the requirements that a community water system and noncommunity water system must follow regarding the form, manner, frequency, and content of a public notice.

ADEQ is making revisions to the public notice section of Arizona's safe drinking water rules to be as stringent as the federal rule. The Public Notice rule requires a public water system to notify persons served when the system fails to comply with a maximum contaminant level (MCL), maximum residual disinfectant level (MRDL) or treatment technique requirement; has a variance or exemption from the drinking water rules; or has a violation of any provision of the safe drinking water rules.

The following is a summary of the Public Notice rule revisions:

1. Public notice requirements are divided into Acute (24 hour), Nonacute Level 1 (30 day), and Nonacute Level 2 (12 month) categories. An Acute (24 hour) public notice is for a violation or situation that poses a serious health threat as a result of short-term exposure. A Nonacute Level 1 (30 day) public notice is for a violation or situation not urgent enough to require an emergency notice, and a Nonacute Level 2 (12 month) public notice is for a violation or situation that poses even less of a health risk.
2. The proposed revisions allow ADEQ flexibility in determining whether a specific monitoring or treatment technique violation should be elevated to a more stringent public notice category.
3. The turbidity consultation subsection requires a public water system to consult with ADEQ within 24 hours after learning of a treatment technique violation resulting from a single exceedance of the maximum allowable turbidity limit, or MCL violation resulting from an exceedance of the two-day turbidity limit. This requirement allows ADEQ to determine if a specific turbidity exceedance violation needs to be elevated from a Nonacute Level 2 (30 day) public notice to an Acute (24 hour) public notice due to public health risk.
4. Appendix A of Article 7, and Appendix A of Article 1 are consolidated in a revised Appendix A of Article 1. This Appendix lists regulated contaminants, corresponding MCLs/MRDLs, revised health effects language, major sources of contaminants in drinking water, and public notice requirements.
5. The multilingual subsection requires a public water system to determine (after consultation with ADEQ) if the system serves a large proportion of non-English speaking consumers. The public water system is required to provide information in the appropriate alternate language regarding the importance of the public notice.

EPA published the "Interim Enhanced Surface Water Treatment; Final Rule" on December 16, 1998. The EPA also published a complimentary rule on December 16, 1998, the "Disinfectants and Disinfection Byproducts; Final Rule", with the intent of simultaneous compliance by applicable water systems to reduce the health risks associated with disinfection byproducts and to increase the control of microbial pathogens.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

The EPA published "Revisions to the Interim Enhanced Surface Water Treatment Rule (IESWTR), the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR), and Revisions to State Primacy Requirements to Implement the Safe Drinking Water Act Amendments" on January 16, 2001. Under this action, EPA made minor revisions to the IESWTR and Stage 1 DBPR and revised the compliance dates in both rules to coincide with calendar quarters.

The IESWTR builds upon the treatment technique requirements of the Surface Water Treatment Rule, promulgated by EPA and adopted by ADEQ. The purposes of the IESWTR are to: improve control of microbiological pathogens, including the protozoan *Cryptosporidium*, and address risk trade-offs with disinfection byproducts. The IESWTR applies to surface water systems that serve 10,000 or more people.

The key provisions in the IESWTR include: a 99% (2 log) *Cryptosporidium* removal requirement for surface water systems; strengthened combined filter effluent turbidity performance standards and individual filter turbidity provisions. EPA believes that implementation of the IESWTR will significantly increase the protection from exposure to *Cryptosporidium*, *Giardia lamblia*, and other waterborne bacterial and viral pathogens.

The Stage 1 DBPR sets requirements for three disinfectants (chlorine, chloramines, and chlorine dioxide), two groups of organic disinfection byproducts (total trihalomethanes (TTHM)--a sum of chloroform, bromodichloromethane, dibromochloromethane, and bromoform); and haloacetic acids (HAA5)--a sum of dichloroacetic acid, trichloroacetic acid, monochloroacetic acid and mono- and dibromoacetic acids), and two inorganic disinfection byproducts (chlorite and bromate).

The regulations consist of MCLs, MRDLs or treatment techniques for disinfectants and their byproducts. The regulations also include monitoring, reporting, and public notification requirements for the compounds. The regulations include the best available technologies upon which the MCLs, and MRDLs are based.

EPA believes the implementation of the Stage 1 DBPR will reduce the levels of disinfectants and disinfection byproducts in drinking water supplies and will provide public health protection for households that were not previously covered by drinking water rules for disinfection byproducts. In addition, the rule will for the first time provide public health protection from exposure to haloacetic acids, chlorite (a major byproduct of chlorine dioxide) and bromate (a major byproduct of ozone). According to the EPA, certain disinfection byproducts, including some trihalomethanes and some haloacetic acids, have been shown to cause cancer in laboratory animals. Other disinfection byproducts have been shown to affect the liver and the nervous system, and cause reproductive or developmental effects in laboratory animals. Exposure to disinfection byproducts may produce similar effects in people.

The Stage 1 DBPR applies to community water systems and nontransient noncommunity water systems that treat their water with a chemical disinfectant for either primary or residual treatment. In addition, requirements for chlorine dioxide apply to transient noncommunity water systems.

ADEQ conducted preliminary workshops around the state in Flagstaff, Payson, Safford, Prescott, Apache Junction, Goodyear, Yuma, Sierra Vista, Tucson, Springerville, and Lake Havasu City to educate water systems and interested parties on the federal requirements being implemented in this rulemaking. Stakeholder meetings were held in Phoenix on June 6, 2000, March 22, 2001, and June 25, 2001 to receive input from stakeholders regarding the rulemaking. After publication of the notice of proposed rulemaking, ADEQ staff conducted hearings to answer questions on the proposed rules and to solicit oral and written comments on the rules; these hearings were held in Flagstaff, Lake Havasu City, Tucson, and Phoenix on October 9 through the October 12.

**B. Section-by-Section Explanation of the Rules**

Section R18-4-101 sets forth definitions. ADEQ added terms used in the new requirements.

Section R18-4-103 sets forth recordkeeping requirements. ADEQ revised R18-4-103 to include recordkeeping requirements for continuous individual filter monitoring.

Section R18-4-104 sets forth reporting requirements. ADEQ revised R18-4-104 by adding reporting requirements for disinfection byproduct MCLs, disinfectant MRDLs, enhanced coagulation, individual filter monitoring, and turbidity.

Section R18-4-105 sets forth general public notification requirements. ADEQ is repealing this Section and replacing it with a new Section, R18-4-105.01, on May 6, 2002. The replacement requirements revise the time-frames and delivery methods of public notice.

ADEQ amended Article 1 Appendix A. This revision lists regulated contaminants, corresponding MCLs/MRDLs, health effects language, major sources of contaminants in drinking water, and public notice requirements.

ADEQ is repealing Section R18-4-210 on May 6, 2002, and incorporating the special public notice requirements for fluoride in R18-4-105.01.

Section R18-4-214 sets forth a MCL and monitoring requirements for total trihalomethanes. ADEQ is repealing R18-4-214 on January 1, 2004, because the new Section R18-4-214.02 will be in effect and address disinfection byproducts, including trihalomethanes.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

ADEQ added Section R18-4-214.01 which establishes MCLs, MRDLs, and monitoring requirements for disinfection byproducts and disinfectant residuals for surface water systems serving 10,000 or more people. ADEQ is setting an effective date of May 1, 2002 for this Section.

ADEQ added Section R18-4-214.02 which establishes MCLs, MRDLs, and monitoring requirements for disinfection byproducts and disinfectant residuals for surface water systems and groundwater systems that continuously disinfect serving any number of people. ADEQ is setting an effective date of January 1, 2004 for this Section.

Section R18-4-220 sets forth Best Available Technologies for applicable MCLs. ADEQ revised R18-4-220 to include the Best Available Technologies for compliance with disinfection byproduct MCLs and disinfectant MRDLs.

Section R18-4-301 sets forth treatment requirements for surface water systems. ADEQ revised R18-4-301 to include a 2 log removal requirement for *Cryptosporidium*.

ADEQ added Section R18-4-301.02 which establishes methods for control of disinfection byproduct precursors (total organic carbon) by enhanced coagulation and enhanced softening.

Section R18-4-302 sets forth filtration requirements. ADEQ revised R18-4-302 to include a more stringent turbidity requirement and 2 log removal requirement of *Cryptosporidium* for surface water systems that serve over 10,000 people.

Section R18-4-303 sets forth disinfection requirements. ADEQ revised R18-4-303 to include a consultation requirement for systems required to profile under 40 CFR § 141.172(b).

Section R18-4-403 sets forth special monitoring requirements for turbidity. ADEQ added a requirement for continuous monitoring for individual filters for surface water systems that serve over 10,000 people, using conventional treatment.

Section R18-4-703 sets forth the requirements for the content of the CCRs. ADEQ amended R18-4-703(D) to add definitions that must be included in a CCR.

Section R18-4-704 sets forth the information on detected contaminants that must be included in a CCR. ADEQ amended R18-4-704(A)(1) to add a reference to Article 1 Appendix A. ADEQ amended R18-4-704(A)(2) to change the references to Appendix B, and replace it with a reference to Table 1. ADEQ made this change to address the revisions to the federal unregulated contaminant monitoring regulations. ADEQ amended R18-4-704(B)(9) to reference Article 1 Appendix A. ADEQ repealed R18-4-704(F), because a system is only required to report unregulated contaminant results for the previous year, which is indicated in Table 1.

Section R18-4-706 sets forth requirements for information on violations. ADEQ amended this Section to add the reference to Article 1 Appendix A, and to add a violation of a MRDL to the list of violations that must be reported.

Section R18-4-709 sets forth requirements for additional health information that must be included in a CCR. ADEQ amended this Section to reflect the changes that EPA requires regarding arsenic levels.

Article 7 Appendix A lists regulated contaminants, MCLs, and possible sources of contamination. ADEQ is incorporated Article 7 Appendix A into Article 1 Appendix A.

Article 7 Appendix B contains the unregulated contaminants that EPA requires monitoring for. ADEQ moved this information to Table 1 in R18-4-704.

Article 7 Appendix C contains health effects language that must be contained in the CCR for MCL violations. ADEQ incorporated Article 7 Appendix C into Article 1 Appendix A.

**7. A reference to any study that the agency relied on in its evaluation of or justification for the rulemaking and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:**

None

**8. 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

**9. Summary of the economic, small business, and consumer impact:**

**EXECUTIVE SUMMARY**

This rulemaking updates the state rules to include changes in the National Primary Drinking Water Regulations. ADEQ expects that the rule will have a minimal economic, small business and consumer impact over the long term, but first year monitoring requirements may have a moderate financial impact on small public water systems and some large water systems required to comply with this rule. The rule allows reduced monitoring for systems which have low levels of the targeted contaminants during the first year of monitoring results. After the first year of monitoring has been accomplished, the economic impact on these systems will be minimal.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

Entities who will be affected by the rule include community water systems, non-transient non-community water systems, transient non-community water systems, the general public, laboratories that perform drinking water analyses, and ADEQ. Laboratories in Arizona that perform the analyses required under this rule may see an economic impact because of expanded monitoring requirements and new monitoring for contaminants. Consumers may have a small increase in their water bill as public water systems pass on the costs associated with implementing the requirements of this rule. ADEQ expects this rule to cause no additional administrative burden or other costs to the Department beyond those associated with the current rules.

**Statutory Criteria**

This EIS is provided pursuant to A.R.S. § 41-1055(B).

**A. Identification of Rule.**

Title 18, Chapter 4, "Department of Environmental Quality Safe Drinking Water."

**B. Identification of the persons who will be directly affected by, bear the costs of or directly benefit from the proposed rulemaking.**

- a) Arizona Department of Environmental Quality (ADEQ)
- b) All public water systems, public and privately-owned, in Arizona
- c) Arizona Department of Health Services (ADHS)-certified laboratories
- d) Consultants
- e) Public

**C. Cost benefit analysis of the probable costs and benefits to the implementing agency and other agencies directly affected by the implementation and enforcement of the proposed rulemaking.**

ADEQ will implement the final rule. Although the rule may require additional compliance assistance, the rule will be implemented without the addition of new ADEQ staff. There may also be additional ADEQ programming costs related to reporting and recordkeeping requirements, as well as additions to Safe Drinking Water database operation and maintenance protocols, as a result of changes to what public water systems will have to submit to ADEQ, but these will be absorbed by ADEQ Safe Drinking Water Section's existing staff and budget. Similarly, no additional staff or significant incremental costs will be required by Maricopa County, which has a delegation agreement with ADEQ. Pima County has a delegation agreement with ADEQ to enforce Arizona Administrative Code Title 18, Chapter 4, Article 5 of the safe drinking water rules.

**D. Cost benefit analysis of the probable costs and benefits to a political subdivision of this state directly affected by the implementation and enforcement of the proposed rulemaking.**

Municipalities and other governmental entities that are community water systems (CWS) and nontransient, noncommunity water system (NTNCWS) will be subject to these rules. Just like privately-owned public water systems, they will be required to achieve compliance with these rules and other requirements of the Safe Drinking Water Rules.

**E. Cost benefit analysis of the probable costs and benefits to businesses directly affected by the proposed rulemaking, including any anticipated effect on the revenues or payroll expenditures of employers who are subject to the proposed rulemaking.**

Regulated entities consist of all public water systems, both publicly and privately owned. Examples of publicly owned public water systems are those owned and operated by municipalities. Public water systems are classified as a CWS, NTNCWS, or a transient, noncommunity water system (TNCWS). CWSs include cities and rural neighborhoods. NTNCWSs include schools, hospitals, and factories. TNCWSs include highway rest stops, gas stations, and recreational facilities. EPA's standing policy is to exclude TNCWSs from drinking water regulations except for acute contaminants. Acute contaminants are those that have the potential to cause adverse health effects resulting from short-term exposure (one-time exposure).

It is not known if the changes to the total trihalomethanes (TTHM) maximum contaminant level (MCL) and the addition of the three disinfection byproduct MCLs under the rulemaking will result in additional MCL violations. Under the current rule, approximately 50 public water systems (all serving more than 10,000 people) have been monitoring for TTHMs with less than 5% of the systems ever violating the TTHM annual average MCL. Groundwater systems that do not have a large number of dead-end lines are not expected to have trouble meeting the disinfection byproduct MCLs due to low levels of Total Organic Carbons (SOCs). SOCS react with the disinfectants and form the disinfection byproducts. Corrective action expenditures, including changing treatment process (switching to ozone for disinfection) or advanced precursor removal (implementing enhanced coagulation or using granular activated carbon), will vary greatly, depending on system-specific conditions. Therefore, it is difficult to estimate in advance what the costs will be. Expenditures that will be made by public water systems to achieve compliance will flow to the private companies, both large and small, that provide these products and services. These costs will be passed on to the customers of public water systems unless the public water system gets financial or technical assistance from federal or state grants.

ADHS-certified laboratories, both in Arizona and elsewhere, conduct analytical testing of drinking water samples required by the SDWA. In Arizona, there are approximately 40 laboratories with business establishments that are certified by ADHS. According to ADHS, 22 labs in Arizona analyze samples for TTHMs, and seven analyze samples for HAA5s, so certified labs will see additional revenue when the public water system are required to begin the monitoring. However, a large revenue stream may not be seen until 2004 because some of the 11 surface water systems serving 10,000 or more persons that have to comply by 2002, have in-house labs that perform the testing for both the TTHMs and HAA5s. The average price for analyzing one sample for TTHMs is approximately \$78.00, according to the labs contacted by the Department. The average price for analyzing one sample for HAA5 is approximately \$190.00. Many of the labs are currently not certified to analyze samples for HAA5 and have to contract with another lab, which may account for the fees. As more labs become certified to perform the analysis, the fees for analysis of HAA5 should decrease. Also, most labs do offer a reduced fee based on the volume of samples to be analyzed. The increase in revenue for the labs may be short lived due to the opportunity for reduced monitoring in the rule (i.e. 4 samples/plant/quarter reduced to 1 sample/plant/quarter)

Engineering Consulting Companies and Manufacturers and Distributors of Water Technology Products. Many of the small public water systems currently do not have in-house technical expertise to achieve compliance with ADEQ safe drinking water rules. To achieve full compliance, they usually have to seek technical and other expertise provided by consulting companies who provide water treatment and related services. In addition, the consulting companies are likely to carry out or prescribe corrective measures (in response to MCL violations) requiring the use of best available technologies (BAT) that are already listed out in existing ADEQ drinking water rules.

F. General description of the probable impact on private and public employment in businesses, agencies and political subdivisions of this state directly affected by the proposed rulemaking.

Large surface water systems will be impacted the most from this rulemaking, since they are required to meet all portions of the rulemaking. Although most of the large surface water systems already perform a majority of the monitoring required in this rule, the water systems will now have to report the results of this monitoring and meet the new MCLs. The reporting of the results should not substantially increase the burden on the water systems. Many labs report to their customers (water systems) on ADEQ approved reporting forms, which the water systems may copy and submit to ADEQ. Many labs offer the service of reporting to ADEQ for the water system for an additional small fee.

All public water systems that violate SDWRs will be impacted by the revised public notification requirements. The impacts have been divided into three categories:

1. Notice preparation costs: Costs that a public water system must incur to comply with the requirements regardless of how many copies of the notice it must deliver. These costs include:
  - a. Labor hour costs associated with becoming familiar with the requirements for the notice,
  - b. Consulting with ADEQ (when necessary),
  - c. Preparing the technical content of the public notice in a format suitable for distribution,
  - d. Identifying the recipients of the notice, and
  - e. Providing instructions about production of the notice.
2. Notice distribution costs: Costs that increase or decrease along with the number of public notices to be delivered. These costs include:
  - a. Costs of producing the reports (costs of paper and photocopying or printing),
  - b. Postage costs when the notice is mailed,
  - c. Costs of posting notices in specified locations, and
  - d. Other labor hour costs of producing and delivering the notices.
3. Costs of repeat notices: Costs of updating the initial notice and delivering a second copy of the notice, if the violation is not corrected within the specified time period. The labor hours vary by both the type and size of the water system. For example, a non-community water system may post the notice, a significantly lower labor hour burden than preparing a mailing or hand delivering the notice. System size also makes a significant difference in total labor costs.

The revised rule allows community water systems to meet the public notice requirements for Nonacute Level 2 (e.g. monitoring violation) through the existing Consumer Confidence Report (CCR). Systems that would otherwise incur a large labor burden and postage burden for distributing a mail notice and paying for a newspaper notice will be able to insert the text of the notice into the CCR and incur no additional costs.

The revised rule requires a system to provide an Acute public notice (e.g. nitrate MCL violation) to its customers as soon as possible but no later than 24 hours (rather than 72 hours) after receiving the results. This

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

shorter time-frame impacts the water systems in that additional staff may have to work on weekends if a violation occurs on a Friday or Saturday. However, the revisions will also decrease the burden on public water systems because the rule allows for a public water system to consolidate Nonacute level 1 and Nonacute level 2 public notices for violations that occur during the respective 30 day or 12 month time-frame rather than providing several different notices.

G. Statement of the probable impact of the proposed rulemaking on small businesses.

1. Identification of the small businesses subject to the proposed rulemaking.

Any of the 733 small public water systems that violate a SDWR are required to meet the new public notice requirements by May 6, 2002. Small public water systems are required to meet the new disinfection and disinfection byproducts requirements by January 1, 2004. All of the 40 small water systems that utilize surface water will be required to meet the new maximum residual disinfectant residual (MRDL) and maximum contaminant levels (MCLs) for disinfection byproducts. However, because the majority of small water systems in Arizona utilize groundwater and are not required to add a chemical disinfectant to the water, only the 280 small systems that do continuously disinfect their groundwater will have to comply with the MRDLs and the new MCLs for disinfection byproducts.

2. Administrative and other costs required for compliance with the proposed rulemaking.

The impacted small public water systems will not necessarily have additional administrative costs for compliance with public notice portion of the rule. The public notice rule currently requires all systems that have violated any portion of the rule to notify their customers. This rule only changes the time-frames in which this notification has to be completed, and in some cases allows for consolidation of several notices. The disinfection byproducts portion of the rule may increase labor costs for small public water systems in the first year the systems is required to monitor, but the rule provides for reduced monitoring if the system is in compliance with the MCLs. A public water system that uses groundwater and that serves less than 500 people is only required to take one sample per plant per year. On average, a system would spend less than one hour collecting this sample. ADEQ is also planning outreach activities to assist small water systems with compliance with the new rules. ADEQ does not anticipate incurring any additional costs from these outreach activities because the activities are already scheduled and include other rule information.

3. Description of the methods that the agency may use to reduce the impact on small businesses.

The disinfection byproduct portion of this rule allows small public water systems (which are small businesses) until January 1, 2004 to achieve compliance without increasing the risks to public health. EPA sets compliance dates and MCLs for all systems, and has given the small water systems the additional time for preliminary planning and evaluation prior to capital improvements. Also, once a small public water systems completes the first year of monitoring for the disinfection byproducts (1 sample/water treatment plant/year), and finds that the level of the contaminants is less than half of the MCL, the rule allows the small public water systems to collect samples less frequently (1 sample/water treatment plant/3 years). The enhanced surface water treatment portion of the rule does not apply to small public water systems, and the public notice portion of this rule has only changed the time-frame for reporting, it has not increased the amount notification. Small public water systems also have the option to notify customers of Nonacute Level 2 violations in their annual consumer confidence report to save money on printing and labor.

4. Probable cost and benefit to private persons and consumers who are directly affected by the proposed rulemaking.

All residents and consumers of drinking water delivered by public water systems are expected to see the health benefits associated with implementation of these rules. If there are MCL violations or detects, the quality of their drinking water should improve when the rule requires systems to either reduce contaminants to acceptable levels or eliminate them.

H. A statement of the probable effect on state revenues.

This rule will not impact ADEQ's revenues.

I. A description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed rulemaking.

ADEQ has determined that there are no less intrusive and less costly alternative methods to achieve the purpose of this rulemaking that are legally permissible.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

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

- Rule:** R18-4-105.01(D)(2)(c)  
**Change:** ADEQ added the requirement to the Acute (24 hour) public notice subsection that a public water system provide a repeat public notice every three months for as long as the violation or situation exists.  
**Reason:** This subsection was added to be consistent with National Primary Drinking Water Regulations and reaffirm the seriousness of public health risk from drinking the water.
- Rule:** R18-4-105.01(E)(2)(b)  
**Change:** ADEQ clarified that only a system that violated the maximum turbidity limit may be exempt from the Acute (24 hour) public notice if all the criteria were met.  
**Reason:** This clarification was added to be consistent with National Primary Drinking Water Regulations.
- Rule:** 105.01(E)(3)(a)(i), 105.01(F)(3)(a)(i), 105.01(F)(3)(b)(i)  
**Change:** ADEQ changed “or” to “and”  
**Reason:** This correction was made to be consistent with National Primary Drinking Water Regulations and require that systems comply with both subsections, (i) and (ii).
- Rule:** 105.01(E)(3)(b)(iii), 105.01(F)(3)(b)(iii)  
**Change:** ADEQ removed this subsection and placed it in a subsection relating to new customers.  
**Reason:** All requirements for public notice to new customers are listed in one subsection.
- Rule:** 105.01(F)(2)(a)  
**Change:** ADEQ moved the portion of this paragraph relating to repeat public notice to a new subparagraph under the same subsection.  
**Reason:** ADEQ moved this requirement to the end of the subsection for rule consistency.
- Rule:** R18-4-105.01(G)  
**Change:** ADEQ added this subsection regarding public notice to new customers or billing units.  
**Reason:** This subsection was added to consolidate subsections 105.01(E)(2)(d), (E)(3)(b)(iii) and (F)(3)(b)(iii).
- Rule:** R18-4-105.01(H)(1)(c)  
**Change:** ADEQ corrected the requirement for the appropriate language to use in public notices to include the information in subsections (H)(5)(a) or (H)(5)(b).  
**Reason:** ADEQ corrected this requirement to be consistent with National Primary Drinking Water Regulations.
- Rule:** R18-4-214.01(J)(1)  
**Change:** ADEQ removed requirement for disinfectant monitoring because the monitoring is already required under another Section.  
**Reason:** Text is removed because applicable systems under this rule already conduct identical sampling under R18-4-303(C)(3) which satisfies R18-4-214.01(J)(1).
- Rule:** R18-4-301(A)(3)  
**Change:** ADEQ removed the “and inactivation” directly preceding “*Cryptosporidium*.”  
**Reason:** This portion of the requirement was removed to ensure that *Cryptosporidium* is removed from the water not inactivated. This is consistent with National Primary Drinking Water Regulations.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

- Rule:** R18-4-301.02(C)(2)  
**Change:** ADEQ revised this subsection to allow systems to request a Step 2 removal requirement anytime after the compliance date, and to clarify that the average of results from four consecutive quarters will determine the Step 2 requirement.  
**Reason:** This clarification was made in response to a comment received by ADEQ.
- Rule:** R18-4-301.02(D)(7)  
**Change:** ADEQ corrected this subsection to require systems that are not in compliance with the Step 1 requirement to apply for and receive approval for a Step 2 TOC removal requirement. The text was also revised to allow a system retroactive compliance with an approved Step 2 requirement.  
**Reason:** This correction reflects the National Primary Drinking Water Regulations.
- Rule:** R18-4-301.02(E)(1)  
**Change:** ADEQ clarified that a waiver would be based on four consecutive quarters of results.  
**Reason:** This clarification was made response to a comment received by ADEQ.
- Rule:** R18-4-302(B)(1), R18-4-302(B)(2)  
**Change:** ADEQ added “maximum turbidity limit” before each level that is never to be exceeded.  
**Reason:** This phrase was added to clarify that the limit was never to be exceeded and to correspond with requirements in the public notice section.
- Rule:** R18-4-302(E)  
**Change:** ADEQ removed references to inactivation of *Cryptosporidium* in this Section.  
**Reason:** The National Primary Drinking Water Regulations only allow for *Cryptosporidium* removal, not inactivation.
- Rule:** R18-4-303(A)  
**Change:** ADEQ removed all references to inactivation of *Cryptosporidium* in the disinfection section.  
**Reason:** This correction was made to reflect the requirement that *Cryptosporidium* be removed from drinking water not inactivated.
- Rule:** R18-4-303(D)  
**Change:** ADEQ removed the requirement for inactivation of *Cryptosporidium*, and added a requirement for systems, that had to conduct profiling under the National Primary Drinking Water Regulations, to consult with the Department before making any changes to the system’s disinfection practice.  
**Reason:** This addition was made to be consistent with National Primary Drinking Water Regulations.
- Rule:** R18-4-401 and 402  
**Change:** ADEQ removed these Sections from this rule package.  
**Reason:** The Sections were removed because the changes were already made and approved by G.R.R.C. on November 6, 2001 in another rule package.
- Rule:** R18-4-403(A)(4)  
**Change:** ADEQ revised this text to clarify that filter measurements at “or after” four hours of continuous filter operation, would require a filter profile.  
**Reason:** This clarification was made in response to a comment received by ADEQ.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

- Rule:** R18-4-403(A)(6)
- Change:** ADEQ added the requirement for a system to implement the modification identified in a comprehensive performance evaluation.
- Reason:** The requirement was added to be consistent with National Primary Drinking Water Regulations.
- Rule:** R18-4-403(A)(6)
- Change:** ADEQ added a statement that a Comprehensive performance evaluation report is subject to Department approval when the evaluation is conducted by a third party.
- Reason:** This was added so that a third party comprehensive performance evaluation report is performed consistently with federal drinking water requirements.

The specific changes referenced above are not a complete list of changes between the proposed and final rules; however, the Department has attempted to reference all significant changes.

**11. A summary of comments and agency responses:**

Both written and oral comments were received during the public comment period. Below is a listing of the comments, an analysis of the comments, and the Department's response to the comments:

- Issue:** “[In the preamble, page 3893, subsection (5)(A)(1)], the levels of Public Notice are divided into Acute, Nonacute Level 1 and Nonacute Level 2. The United States Environmental Protection Agency uses the terms Tier 1, Tier 2 and Tier 3 in describing the three levels of Public Notification. The use of the Tier 1, Tier 2 and Tier 3 titles are less confusing and we recommend their use in this rule.”
- Response:** The public notice categories were discussed at a stakeholder meeting held on June 25, 2001. The stakeholders discussed whether to use EPA's three-tier public notice structure or ADEQ's Acute, Nonacute Level 1, and Nonacute Level 2 notice structure. The consensus of the stakeholders was that the use of an Acute, Nonacute Level 1, and Nonacute Level 2 public notice is less confusing than EPA's Tier 1, Tier 2, Tier 3 notice, especially for small water systems, because Acute and Nonacute is being used in the current rule and it is appropriate to maintain the same structure in the final public notice rule. Also, the stakeholders felt that adding time-frames to the public notice categories (for example, Acute (24 hour), Nonacute Level 1 (30 day), and Nonacute Level 2 (12 month) is appropriate. ADEQ agrees with the stakeholders because the Acute, Nonacute Level 1, and Nonacute Level 2 system of public notification effectively separates the form, manner, content, and frequency of the public notice based on the seriousness of any potential adverse health effects.
- Action taken:** None
- Issue:** “[In the preamble, page 3894, subsection (5)(B),] R18-4-104 sets forth reporting requirements. We assume ADEQ will provide report forms for the new parameters in a timely fashion.”
- Response:** ADEQ plans to provide reporting forms for the new parameters to public water systems in December 2001.
- Action taken:** None
- Issue:** “[The last sentence in R18-4-105.01(C)(2)] should read, “The Department's decision to allow limited distribution of the notice shall be in writing.”
- Response:** ADEQ agrees with the commenter and will revise the text.
- Action taken:** The word “be” was added to the last sentence in subsection R18-4-105.01(C)(2).
- Issue:** “[Subsection R18-4-105.01(E)(2)(c)] addresses the public water system not being able to contact the Department within 24 hours due to weekends or holidays for a Nonacute Level 1 (30 day) notice. If the public water system has 30 days to perform the public notice, what is the problem with waiting a day or two to obtain Department approval of the notice?”
- Response:** ADEQ recognizes that the term “contact” is used throughout the drinking water rules. However, subsection R18-4-105.01(E)(2)(c) requires water systems to “consult” with the Department within 24 hours after learning of a violation of the maximum allowable turbidity limit. This rule also

requires systems that are unable to consult with the Department to provide an Acute (24 hour) public notice, not a Nonacute Level 1 (30 day) notice. The reason for turbidity consultation is to allow the Department and the public water system an opportunity to discuss whether to elevate the public notice requirement to Acute (24 hour).

**Action taken:** None

**Issue:** “[Subsections R18-4-105.01(E)(2)(c)(i) and R18-4-105.01(E)(2)(c)(ii) require] the public water system to give public notice even though the public has not been served with water that exceeded any Maximum Contaminant Level, MCL. It seems prudent of the public water system to “...document that water has been fed to waste and not served to customers” and “...document that water has been recycled not served to customers.” Why is public notice being required in these cases? Pumping a well to waste is a responsible practice to achieve compliance with MCLs.”

**Response:** The maximum turbidity limit is different from other MCLs. The turbidity rule (R18-4-302) requires water treatment plants to meet maximum turbidity limits at all times. This public notice requirement is designed to address filter problems prior to violating the maximum turbidity limit. In the instance of a maximum turbidity violation, the source is on line and supplying water to the distribution system. The Department recognizes that many systems pump wells to waste while they are assessing the well water quality prior to connection to the distribution system. In the case of maximum turbidity, this approach would not be in the best interest of public health protection.

**Action taken:** None

**Issue:** “[Subsection R18-4-105.01(E)(2)(c)(iii)] addresses a malfunctioning turbidimeter. Again, if we can “...document that the testing equipment malfunctioned and high turbidity readings were erroneously obtained”, why is public notice required? If it lasted a period of time, say, four hours, or alternate testing or repairs were not instituted as mandated in R18-4-403 Special Monitoring for Turbidity, then a public notice might be warranted for failure to monitor.”

**Response:** Public notice is required even when the testing equipment malfunctioned and high turbidity readings were erroneously obtained because the true turbidity measurements were unknown at the time the measurements were taken due to the malfunction, and there is a possibility that the maximum turbidity limit may have been exceeded. This does not indicate an immediate health risk, but a Nonacute Level 1 (30 day) public notice must be distributed to persons served by the water system informing them that they may have potentially been exposed to turbidity that was above the allowable limit. This public notice would not be for a monitoring violation, but for potentially exceeding the maximum turbidity limit.

**Action taken:** None

**Issue:** “Appendix A. Regulated Contaminants, we like the layout of this table. It compiles a lot of information in one area, which is good. However, the multiple types of public notices in the last two columns is confusing. For example, Fecal coliforms and *E. coli* are acute violations for both MCL and not monitoring. But why is not monitoring also a nonacute level 2? Table 4 in this Section does not add any guidance.”

**Response:** The public notice involving fecal coliform monitoring may be an Acute (24 hour) or Nonacute Level 1 (30 day) notice, depending on when the water system failed to monitor for the contaminant. If a system fails to monitor for fecal coliform in an initial sample, a Nonacute Level 1 (30 day) notice must be distributed. However, if a system fails to monitor for fecal coliform in a repeat sample, an Acute (24 hour) notice must be distributed. See R18-4-202(K).

**Action taken:** None

**Issue:** The references in Endnote a of Appendix A appears to be incorrect. “The first sentence refers to “Endnote (a)(1) and Endnote (a)(2) while the paragraphs are labeled (a)(i) and (a)(ii).”

**Response:** ADEQ agrees with the commenter and will revise the text.

**Action taken:** The references “Endnote (a)(1)” and “Endnote (a)(2)” has been changed to “Endnote (a)(i)” and “Endnote (a)(ii)” in Endnote a of Appendix A.

**Issue:** R18-4-214.01(F)(1) refers to specific locations and schedule. “Please define what schedule means. If it means that water system has to establish in advance the time of the quarter the samples to be

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

collected, this will be limiting to resource management. I recommend that you leave the schedule of sample collection be left to water system.”

**Response:** The monitoring plan is intended to be a management tool for the water supplier. The schedule for collecting samples is determined by the monitoring requirements of subsections (G), (H), (J), and (L) of R18-4-214.01. These four subsections list the frequency and conditions under which a surface water system serving 10,000 or more persons must collect samples for disinfection byproducts, disinfection residuals, and disinfection byproduct precursors.

**Action taken:** None

**Issue:** “R18-4-214.01(F) states that the sampling plan is to be submitted by January 31, 2002. Also, the plan is to be submitted no later than the date of the first report required in R18-4-104(A): Potential conflict. The First report is required after the end of the quarter (March 2002). Thirty days after then is at least April 2002.”

**Response:** R18-4-214.01(F) states that the monitoring plan shall be ready and available for inspection by the Department and the general public no later than January 31, 2002. The monitoring plan must be submitted to the Department no later than the date of the first report required under R18-4-104(A), which is April 10, 2002.

**Action taken:** None

**Issue:** “[The commenter’s comments relate] to the enhanced coagulation requirements and criteria proposed in A.A.C. R18-4-301.02, and methods for calculating TOC removal targets and compliance with such targets prescribed therein:

Subsection (C)(1) Step 1 TOC Percent Reduction Requirement

As prescribed in the federal rule, subsection A(1) of the proposed state rule establishes an alternate compliance criteria of <2.0 mg/L source water TOC calculated quarterly as a running annual average. If a system cannot meet this and all other alternate criteria in subsection (A), a system must meet the TOC removal requirements established in the Step 1 TOC removal matrix in subsection (C).

Subsection (C), however, does not prescribe how source water TOC and alkalinity are calculated for a system in determining the TOC removal requirement. A system may experience dramatic fluctuations in source water TOC and alkalinity over a year. Are source water TOC and alkalinity each calculated as an annual average, or does each monthly TOC and alkalinity measurement result in a monthly TOC removal requirement which is then averaged with other months to determine the weighted annual average removal requirement. The former of these two methods would be consistent with the alternate compliance criteria established in subsection (A), and would be consistent with the compliance calculation criteria established in subsection (D). This clarification could be made using the following language in subsection (C)(1):

Step 1: The Step 1 TOC percent reduction requirement is based on source water alkalinity and source water TOC, each calculated as a running annual average.

Subsection (C)(2), Step 2 and Subsection (E), Waiver

CFR § 141.135(b)(4) in the federal rule establishes bench-scale testing procedures for determining alternative (Step 2) TOC removal requirements when Step 1 requirements cannot be met as well as for determining enhanced coagulation waiver applicability. While this subsection does not specify the frequency and duration of bench-scale testing, the rule preamble states that “The alternative TOC removal percentage is determined by performing jar tests on at least a quarterly basis for one year” (Section III. D, Federal Register pg. 69413). Performing four or more jar tests, however, would provide four separate and potentially very different results in the form of “TOC removal versus coagulant dose” curves.

Subsection (C)(2)(a) of the proposed state rule establishes the Step 2 TOC removal requirements as “the percent removal of TOC at the point of diminishing return on the “TOC removal versus coagulant dose” curve under subsection (C)(2)(d) which results from bench or pilot-scale testing”. Neither the state rule nor the Federal rule, however, addresses the fact that there are actually four “TOC removal versus coagulant dose” curves based on four quarterly jar tests, or how to take all four curves into account when calculating one TOC removal requirement. Is the point of diminishing returns averaged among each of the four curves? Is the highest quarterly Step 2 TOC percentage removal result used as the ongoing requirement? (This is not recommended!) Is each incremental result of TOC removal for all jar tests averaged at each alum dose to obtain one representative curve?

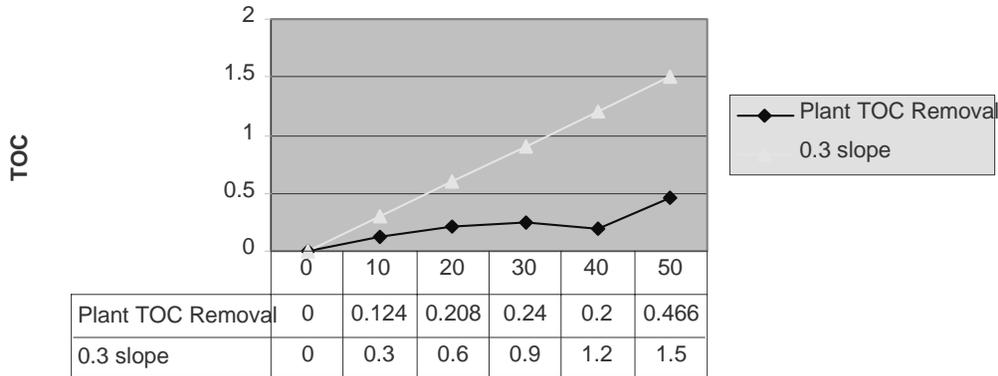
[The commenter] recommends that the latter, or a dose curve based on an annual average of quarterly curves, be used for determining the Step 2 removal requirement and for determining waiver applicability, and that the use of an annual average curve be prescribed in the rule. Current language in subsections (D) and (E) of the proposed state rule could make compliance with Step 1 and Step 2 requirements and eligibility for the waiver impossible for some sys-

**Arizona Administrative Register**  
**Notices of Final Rulemaking**

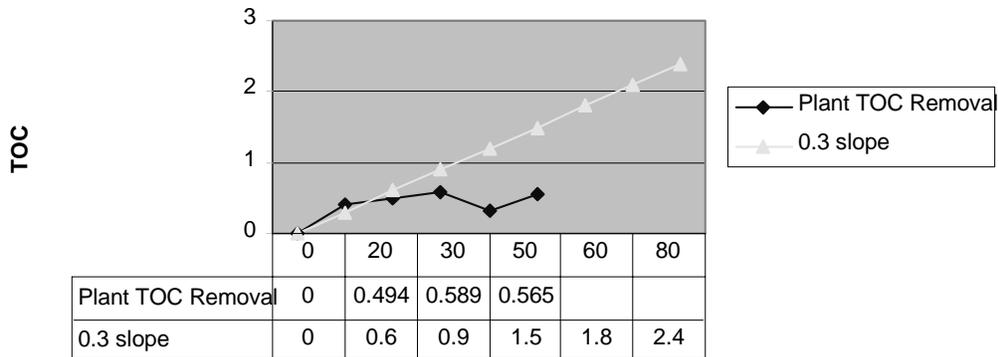
tems. Section (D), Compliance, states that compliance with either Step 1 or Step 2 requirements is determined using “the annual average of TOC percent removal”. Enhanced coagulation waiver applicability, however, is determined based on TOC removal “consistently less than 0.3 mg/L...per 10 mg/L of incremental alum dose at all doses of alum for four quarters of bench- or pilot-scale tests” (R18-4-301.02(E)). (Please note that the federal rule uses the same waiver applicability language without saying “for four quarters of bench- or pilot-scale testing”).

“The inconsistency between *annual average* Step 1 and 2 compliance calculations, and <0.3 mg/L TOC removal at *all doses for all quarters* waiver applicability, will make compliance impossible for systems that have *annual average* TOC removal curves at <0.3 mg/L at all alum doses, but that have >0.3 mg/L removal response at *one* alum dose in *one* quarter. To illustrate, [the commenter submitted] actual quarterly jar test data, represented graphically on the following two pages, for one [of the commenter’s] water treatment plants:

**Quarter 1**

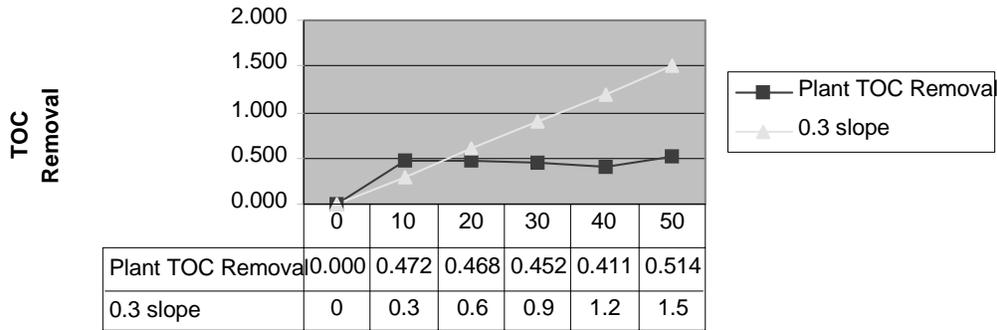


**Quarter 2**

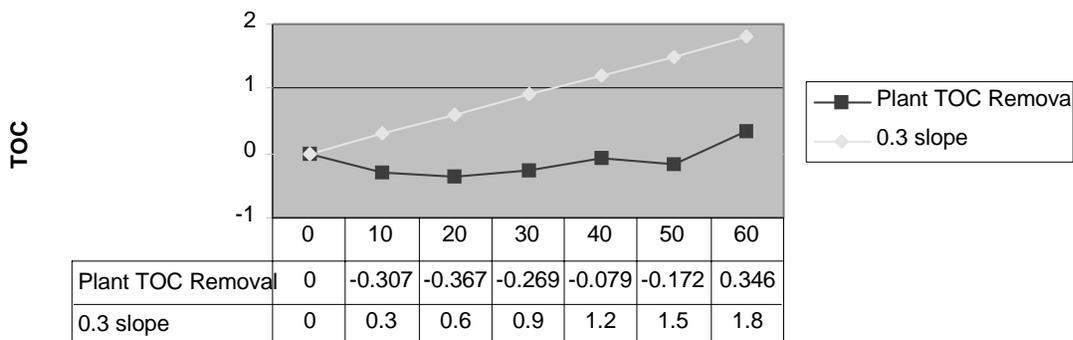


*Arizona Administrative Register*  
**Notices of Final Rulemaking**

**Quarter 3**



**Quarter 4**



As you can see from the graphs above, TOC removal is **not** “consistently less than 0.3 mg/L...per 10 mg/L of incremental alum dose at all doses of alum for four quarters of bench- or pilot-scale tests” as required in subsection (E) for waiver applicability. The system achieves 0.3 mg/L TOC removal at 10 mg/L alum in both Quarter 2 and Quarter 3. In addition, the line representing the system’s annual average of percent TOC removal, which is used to determine compliance with Step 2 requirements, never goes above the 0.3 mg/L removal curve, which is used to establish the Step 2 removal requirement. Because the annual average TOC removal at all incremental alum doses never exceeds 0.3 mg/L, but at least one incremental dose in one jar test results in >0.3 mg/L TOC removal, there is no possible way that this system could meet the Step 2 requirements or obtain a waiver under the proposed rule language.

In addition, assuming such a system had a source water TOC of 2.4 mg/L, and >120 mg/L source water alkalinity (a best-case scenario), this system does not meet the 15% annual average Step 1 TOC removal requirement at any alum dose. Because average source water TOC for this system is >2.0 mg/L, this system also does not meet the alternate compliance criteria. Such a system simply could not comply with the proposed rule, despite the fact that such a system, with relatively low treated water TOC, would have disinfection by-product levels well below the standards with proper disinfection and reasonable system residence times.

This problem with the proposed rule language is resolved simply by amending the language to ensure consistency between alternate compliance criteria calculations, Step 1 calculations, Step 2 calculations, waiver applicability calculations, and compliance calculations. The rule already specifies annual averages for alternate compliance criteria determinations in subsection (A) and compliance calculations in subsection (D). I have already recommended changes to the language in subsection (C)(1) (Step 1), above.

Step 2 TOC removal requirement calculations could be addressed by making the following changes to subsection (C)(2) of the proposed rule:

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

1. (C)(2), first paragraph, second sentence:

The Step 2 TOC removal requirement shall be based on the results of four quarters of bench- or pilot-scale testing performed by the system.

2. (C)(2)(a).

The Step 2 TOC removal requirement is the percent removal of TOC at the point of diminishing return on the annual average "TOC removal versus coagulant dose" curve under subsection (C)(2)(d) which results from four quarters of bench- or pilot-scale testing.

3. (C)(2)(d).

The "TOC removal versus coagulant dose" for each quarter of bench- or pilot-scale testing is found by adding incremental 10 mg/L doses of alum...to the point where TOC removal is less than or equal to 0.3 mg/L and is within the target pH. Systems are not required to add additional coagulant past the dose needed to reach the target pH unless the water has low alkalinity. The annual average "TOC removal versus coagulant dose", which is used for determining the Step 2 TOC removal requirement, is the annual average of quarterly TOC removal results at each incremental 10 mg/L dose of alum.

Along with the changes to subsection (C)(2) proposed above, the waiver applicability calculations could be addressed by making the following change to subsection (E)(1):

1. A system may submit a written request to the Department for a waiver of enhanced coagulation requirements. The system shall submit documentation demonstrating that the TOC removal during the bench- or pilot-scale tests is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all doses of alum (or equivalent addition of iron coagulant) as an annual average of incremental results from four quarters of bench- or pilot-scale tests.

This proposed language for subsections (C)(2) and (E)(1) is consistent with the federal requirements and rule language with the added benefit that it clarifies how **four** quarters of jar testing is used to determine **one** Step 2 removal requirement, or applicability of a waiver based on **one** "TOC versus coagulant dose" curve. In making this clarification, consistency between all TOC removal requirement calculations and compliance calculation procedures in the rule is established."

**Response:** The comment addresses an mathematical inconsistency in R18-4-301.02 which effects the water system's ability to comply due to natural source water fluctuations. Compliance with R18-4-301.02 is determined under subsections (A) and (D) with a running annual average of data. However, when determining a Step 2 TOC removal requirement under subsection (C)(2) and the Waiver under subsection (E), the proposed rule does not require that data from bench- or pilot-scale testing be averaged. The comment suggests that language be added to subsections (C)(2) and (E) stating that data from bench- or pilot-scale testing be averaged. The comment also suggests that four consecutive quarters of bench- or pilot-scale testing be required for determining a Step 2 TOC removal requirement. ADEQ agrees with the points made in this comment.

**Action taken:** Changes have been made to R18-4-301.02, subsections (C)(2) and (E)(1). These subsections now state that data submitted to the Department from bench- or pilot- scale testing will be averaged when determining a Step 2 TOC removal requirement or the applicability of a Waiver. In addition, language has been added to subsection (C)(2) so that four consecutive quarters of bench- or pilot-scale testing is required when determining a Step 2 TOC removal requirement.

**Issue:** The compliance dates for the new rules apply to a system with a source determined to be GUDI. If a system is identified after the dates listed in the new rules, the system is out of compliance immediately. This issue needs to be addressed so that systems will not be out of compliance immediately when notified by the Department that the system has a source that is GUDI.

**Response:** Once a source has been identified as groundwater under the direct influence of surface water, under R18-4-302(G) a system has 18 months to come into compliance with rules which apply to surface water systems.

**Action taken:** None

**Issue:** "R18-4-403(A)(4). ...Taken 15 minutes apart **at the end** of the first four hours of continuous ... Replace statement by: **At or after four hours**. Existing language may be interpreted as only at the point of end of the four hours."

**Response:** The suggested change in rule language more accurately communicates the intent of the rule.

**Action taken:** The following change has been made to R18-4-403(A)(4): For an individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes

apart at or after four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system shall produce a filter profile within seven days of such event if the system is not able to identify an obvious reason for the abnormal filter performance.

**Issue:** "R18-4-403(A)(6). ...no later than 30 days after... Is this deadline to commence the CPE or to complete it? Also, do we have to submit any documentation on the CPE?"

**Response:** According to R18-4-403(A)(6), a system has 30 days from the day of the exceedance to schedule a comprehensive performance evaluation to be performed by the Department or a third party approved by the Department. According to R18-4-104(K)(3)(b)(iv), the comprehensive performance evaluation shall be completed and submitted to the Department within 90 days following the exceedance.

**Action taken:** None

**Issue:** "In some areas ADEQ is proposing to update current rules or are proposing new rules that will be repealed in a year or more and in some cases replaced by a new rule. As an example, Page 3923, R18-4-214 has some minor changes and will be repealed in January 1, 2004 and replaced with R18-4-214.01 starting on page 3924. We are concerned about potential confusion if someone misses the (Repeal January 1, 2004) note. Will both versions be in the final document? If so, some distinction, warning or other notice should be included to effectively highlight this change in the January 1, 2004 example."

**Response:** R18-4-214, R18-4-214.01, and R18-4-214.02 will be in the final rule. For each Section, the title has a note as to when the Section will be repealed or become effective. Subsection (A) in each Section states the type and size of systems which must comply with that particular Section. R18-4-214 and R18-4-214.01 will be repealed on January 1, 2004. With the exception of R18-4-214.01(B), the same requirements for surface water systems serving at least 10,000 persons appear in R18-4-214.02. ADEQ feels this rule structure is necessary to accommodate the multiple compliance dates within the Stage 1 DBPR. Letters will be sent to remind systems of these rule changes.

**Action taken:** None

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

Not applicable

**13. Incorporations by reference and their location in the rules:**

Not applicable

**14. Was this rule previously adopted as an emergency rule?**

No

**15. The full text of the rules follows:**

**TITLE 18. ENVIRONMENTAL QUALITY**

**CHAPTER 4. DEPARTMENT OF ENVIRONMENTAL QUALITY**

**SAFE DRINKING WATER**

**ARTICLE 1. GENERAL REQUIREMENTS**

Section

R18-4-101. Definitions

R18-4-103. Recordkeeping Requirements

R18-4-104. Reporting Requirements

R18-4-105. Public Notification Requirements (Repeal May 6, 2002)

R18-4-105.01. Public Notification Requirements (Effective May 6, 2002)

Appendix A. ~~Mandatory Health Effects Language~~ Regulated Contaminants

**ARTICLE 2. MAXIMUM CONTAMINANT LEVELS AND MONITORING REQUIREMENTS;  
MONITORING ASSISTANCE PROGRAM**

Section

R18-4-210. Fluoride; Special Public Notice (Repeal May 6, 2002)

R18-4-214. Total Trihalomethanes; MCL and Monitoring Requirements (Repeal January 1, 2004)

R18-4-214.01. Disinfectant Residuals and Disinfection Byproducts (Effective May 1, 2002; Repeal January 1, 2004)

R18-4-214.02. Disinfectant Residuals and Disinfection Byproducts (Effective January 1, 2004)

R18-4-220. Best Available Technology

**ARTICLE 3. TREATMENT TECHNIQUES**

Section

R18-4-301. Surface Water Treatment

R18-4-301.02. Control of Disinfection Byproduct Precursors by Enhanced Coagulation and Enhanced Softening

R18-4-302. Filtration

R18-4-303. Disinfection

**ARTICLE 4. SPECIAL MONITORING REQUIREMENTS**

Section

R18-4-403. ~~Renumbered~~ Special Monitoring for Turbidity

**ARTICLE 7. CONSUMER CONFIDENCE REPORTS**

Section

R18-4-703. Content of ~~the~~ Consumer Confidence ~~Report~~ Reports

R18-4-704. Information on Detected Contaminants

R18-4-706. Information on Violations

R18-4-709. Additional Health Information

Appendix A. ~~Regulated Contaminants~~ Repealed

Appendix B. ~~Required Monitoring for Unregulated Contaminants~~ Repealed

Appendix C. ~~Health Effects Language~~ Repealed

**ARTICLE 1. GENERAL REQUIREMENTS**

**R18-4-101. Definitions**

~~The terms in this Chapter have the following meanings~~ In addition to the definitions in A.R.S. § 49-201, in this Chapter, unless otherwise specified:

“Action level” No change

“ADHS” No change

“Air-gap separation” No change

“ANSI/NSF Standard 60” No change

“ANSI/NSF Standard 61” No change

“Backflow” No change

“Backflow-prevention assembly” No change

“Baseline sampling” No change

“BAT” No change

“Best available technology” No change

“CCR” No change

“Certified operator” No change

“Coagulation” No change

“Community water system” No change

“Compliance cycle” No change

“Compliance period” No change

“Comprehensive performance evaluation” means a thorough review and analysis of a water treatment plant’s performance-based capabilities and associated administrative, operation and maintenance practices. A comprehensive performance evaluation consists of at least the following components: assessment of water treatment plant performance, evaluation of major unit processes, identification and prioritization of performance limiting factors, assessment of the applicability of comprehensive technical assistance, and preparation of a comprehensive performance evaluation report.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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- “Consecutive public water system” No change
- “Contaminant” No change
- “Contractor” No change
- “Conventional filtration” No change
- “Corrosion inhibitor” No change
- “Cross connection” No change
- “CWS” No change
- “Detected” No change
- “Diatomaceous earth filtration” No change
- “Direct filtration” No change
- “Disinfectant” No change
- “Disinfection” No change
- “Distribution system” No change
- “Domestic or other non-distribution system plumbing problem” No change
- “Dose equivalent” No change
- “Double check valve assembly” No change
- “Elementary business plan” No change
- “Enhanced coagulation” means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.
- “Enhanced softening” means the improved removal of disinfection byproduct precursors by precipitative softening.
- “EPA” No change
- “Exclusion” No change
- “Exemption” No change
- “Existing public water system” No change
- “Filter profile” means a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.
- “Filtration” No change
- “Financial capacity” No change
- “First-draw sample” No change
- “Flocculation” No change
- “GAC” No change
- “GAC10” means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days.
- “GC” No change
- “GC/MS” No change
- “Gross alpha particle activity” No change
- “Gross beta particle activity” No change
- “Groundwater system” No change
- “Groundwater under the direct influence of surface water” No change
- “HAA5” means haloacetic acids (five).
- “Haloacetic acids (five)” means the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.
- “Halogenated” No change
- “HPC” No change
- “Initial compliance period” No change
- “Initial monitoring year” No change

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

“Large water system” No change

“Lead-free” No change

“Lead service line” No change

“Log” means, the percentage removal or inactivation of *Cryptosporidium* oocysts, *Giardia lamblia* cysts, or viruses as follows:

“One-log” is 90%.

“Two-log” is 99%.

“Three-log” is 99.9%.

“Four-log” is 99.99%.

“Major stockholder” No change

“Man-made beta particle and photon emitters” No change

“Managerial capacity” No change

“Maximum contaminant level” No change

“Maximum residual disinfectant level” means a level of a disinfectant added for water treatment that may not be exceeded at the consumer’s tap without an unacceptable possibility of adverse health effects.

“Maximum total trihalomethane potential” No change

“MCL” No change

“MFL” No change

“Medium water system” No change

“Meter” No change

“Meter weight” No change

“Millirem” No change

“MRDL” means maximum residual disinfectant level.

“MTP” No change

“Monitoring assistance program” No change

“Nephelometric turbidity unit” No change

“New public water system” No change

“Noncommunity water system” No change

“Nontransient, noncommunity water system” No change

“NTNCWS” No change

“NTU” No change

“Optimal corrosion control treatment” No change

“OX” No change

“PCBs” No change

“pCi” No change

“Picrocurie” No change

“Point-of-entry into the distribution system” No change

“Point-of-entry treatment device” No change

“Point-of-use treatment device” No change

“Pressure vacuum breaker assembly” No change

“PTA” No change

“Public water system” No change

“Reduced pressure principle backflow-prevention assembly” No change

“Rem” No change

“Repeat compliance period” No change

“Residual disinfectant concentration” No change

“Safe Drinking Water Act” No change

“Sanitary survey” No change

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

“Sedimentation” No change

“Service connection” No change

“Service line” No change

“Service line sample” No change

“Single-family structure” No change

“Slow sand filtration” No change

“Small water system” No change

“SOC” No change

“Source” No change

“Specific ultraviolet absorption” means an indicator of the humic content of a water at 254 nanometers (nm). It is a calculated parameter obtained by dividing a sample’s ultraviolet absorption at a wavelength of 254 nm ( $UV_{254}$ ) ( $m^{-1}$ ) by its concentration of dissolved organic carbon (DOC) (in mg/L).

“Standard sample” No change

“Surface water” No change

“Surface water system” No change

“SUVA” means specific ultraviolet absorption.

“Technical capacity” No change

“TNCWS” No change

“TOC” means total organic carbon.

“Total organic carbon” means total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

“Total trihalomethanes” No change

“Transient, noncommunity water system” No change

“Treatment” No change

“Treatment technique” No change

“Trihalomethane” No change

“TTHM” No change

“Unit fee” No change

“Virus” No change

“VOC” No change

“Water main” No change

“Water supplier” No change

“Waterborne disease outbreak” No change

“Water treatment plant” No change

**R18-4-103. Recordkeeping Requirements**

**A.** No change

1. No change

2. No change

3. No change

4. No change

5. No change

6. No change

7. No change

a. No change

b. No change

c. No change

d. No change

e. No change

8. A surface water system shall retain records of individual filter monitoring specified in R18-4-403 for three years.

9. A public water system shall retain copies of a public notice and a certification for three years after issuance.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

B. No change

**R18-4-104. Reporting Requirements**

A. No change

1. No change
2. No change
3. Total trihalomethanes: A public water system monitoring under R18-4-214 shall report the arithmetic average of analytical results for total trihalomethanes within 30 days of receipt of the last analytical results of the previous quarter.
4. Disinfection byproducts, disinfectant residuals, disinfection byproduct precursors and enhanced coagulation or enhanced softening: The following results shall be reported as specified by the time-frame under subsection (A).
  - a. Disinfection byproducts. A CWS, NTNCWS, or TNCWS shall report the information specified in Table 1:

**Table 1. Reporting Requirements for Disinfection Byproducts**

| <b><u>IF YOU ARE A...</u></b>  | <b><u>YOU MUST REPORT...</u></b>  |
|--|---|
| <u>A. System monitoring for TTHMs and HAA5 under the requirements of R18-4-214.01 or R18-4-214.02 on a quarterly or more frequent basis</u>                  | <ol style="list-style-type: none"> <li>1. <u>The number of samples collected during the last quarter.</u></li> <li>2. <u>The location, date, and result of each sample collected during the last quarter.</u></li> <li>3. <u>The arithmetic average of all samples collected in the last quarter.</u></li> <li>4. <u>The annual arithmetic average of the quarterly arithmetic averages for the last four quarters.</u></li> <li>5. <u>Whether, based on R18-4-214.01(I)(3) or R18-4-214.02(H)(3), the MCL was violated.</u></li> </ol>   |
| <u>B. System monitoring for TTHMs and HAA5 under the requirements of R18-4-214.01 or R18-4-214.02 less frequently than quarterly (but at least annually)</u> | <ol style="list-style-type: none"> <li>1. <u>The number of samples collected during the last year.</u></li> <li>2. <u>The location, date, and result of each sample collected during the last monitoring period.</u></li> <li>3. <u>The arithmetic average of all samples collected over the last year.</u></li> <li>4. <u>Whether, based on R18-4-214.01(I)(3) or R18-4-214.02(H)(3), the MCL was violated.</u></li> </ol>   |
| <u>C. System monitoring for TTHMs and HAA5 under the requirements of R18-4-214.01 or R18-4-214.02 less frequently than annually</u>                          | <ol style="list-style-type: none"> <li>1. <u>The location, date, and result of the last sample collected.</u></li> <li>2. <u>Whether, based on, R18-4-214.01(I)(3) or R18-4-214.02(H)(3), the MCL was violated.</u></li> </ol>  |
| <u>D. System monitoring for chlorite under the requirements of R18-4-214.01 or R18-4-214.02</u>  | <ol style="list-style-type: none"> <li>1. <u>The number of entry point samples collected each month for the last three months.</u></li> <li>2. <u>The location, date, and result of each sample (both point-of-entry into the distribution system and in the distribution system) collected during the last quarter.</u></li> <li>3. <u>For each month in the reporting period, the arithmetic average of all samples collected in each set of three samples collected in the distribution system.</u></li> <li>4. <u>Whether, based on R18-4-214.01(I)(5) or R18-4-214.02(H)(5), the MCL was violated, in which month, and how many times it was violated each month.</u></li> </ol> |
| <u>E. System monitoring for bromate under the requirements of R18-4-214.01 or R18-4-214.02</u>   | <ol style="list-style-type: none"> <li>1. <u>The number of samples collected during the last quarter.</u></li> <li>2. <u>The location, date, and result of each sample collected during the last quarter.</u></li> <li>3. <u>The arithmetic average of the monthly arithmetic averages of all samples collected in the last year.</u></li> <li>4. <u>Whether, based on R18-4-214.01(I)(4) or R18-4-214.02(H)(4), the MCL was violated.</u></li> </ol>   |

- b. Disinfectant Residuals. A CWS, NTNCWS, or TNCWS shall report the information specified in Table 2:

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

**Table 2. Reporting Requirements for Disinfection Residuals**

| <b><u>IF YOU ARE A...</u></b>  | <b><u>YOU MUST REPORT...</u></b>  |
|--|---|
| <u>A. System monitoring for chlorine or chloramines under the requirements of R18-4-214.01 or R18-4-214.02</u> | <ol style="list-style-type: none"> <li><u>1. The number of samples collected during each month of the last quarter.</u></li> <li><u>2. The monthly arithmetic average of all samples collected in each month for the last 12 months.</u></li> <li><u>3. The arithmetic average of all monthly averages for the last 12 months.</u></li> <li><u>4. Whether, based on R18-4-214.01(K)(2) or R18-4-214.02(J)(2), the MRDL was violated.</u></li> </ol> |
| <u>B. System monitoring for chlorine dioxide under the requirements of R18-4-214.01 or R18-4-214.02</u>        | <ol style="list-style-type: none"> <li><u>1. The dates, results, and locations of samples collected during the last quarter.</u></li> <li><u>2. Whether, based on R18-4-214.01(K)(3) or R18-4-214.02(J)(3), the MRDL was violated.</u></li> <li><u>3. Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation required an Acute or Nonacute Level 1 public notice.</u></li> </ol>                    |

- c. Disinfection byproduct precursors and enhanced coagulation or enhanced softening. A CWS or NTNCWS shall report the information specified in Table 3:

**Table 3. Reporting Requirements for Disinfection Byproduct Precursors and Enhanced Coagulation or Enhanced Softening**

| <b><u>IF YOU ARE A...</u></b>   | <b><u>YOU MUST REPORT...</u></b>  |
|---|---|
| <u>A. System monitoring monthly or quarterly for TOC and alkalinity under the requirements of R18-4-214.01 or R18-4-214.02 and required to meet the enhanced coagulation or enhanced softening requirements in R18-4-301.02</u> | <ol style="list-style-type: none"> <li><u>1. The number of sample sets (source water TOC and alkalinity and treated water TOC) collected during the last quarter.</u></li> <li><u>2. The location, date, and results of each sample set collected during the last quarter.</u></li> <li><u>3. For each month in the reporting period that sample sets were collected, the monthly arithmetic average of the percent removal of TOC and the required TOC percent removal.</u></li> <li><u>4. Calculations for determining compliance with the TOC percent removal requirements, as provided in R18-4-301.02(D).</u></li> <li><u>5. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in R18-4-301.02(C) for the last four quarters.</u></li> </ol>  |
| <u>B. System monitoring monthly or quarterly for TOC under the requirements of R18-4-214.01 or R18-4-214.02 and meeting one or more of the alternative compliance criteria in R18-4-301.02(A)(1)-(8)</u>                        | <ol style="list-style-type: none"> <li><u>1. The alternative compliance criterion that the system is using.</u></li> <li><u>2. The number of sample sets (source water TOC and alkalinity and treated water TOC) collected during the last quarter.</u></li> <li><u>3. The location, date, and result of each sample set collected during the last quarter.</u></li> <li><u>4. The running annual arithmetic average based on monthly averages or quarterly samples of source water TOC for systems meeting a criterion in R18-4-301.02(A)(1) or (8) or of treated water TOC for systems meeting the criterion in R18-4-301.02(A)(2).</u></li> <li><u>5. The running annual arithmetic average based on monthly averages or quarterly samples of source water SUVA for systems meeting the criterion in R18-4-301.02(A)(4) or of treated water SUVA for systems meeting the criterion in R18-4-301.02(A)(5).</u></li> <li><u>6. The running annual average of source water alkalinity for systems meeting the criterion in R18-4-301.02(A)(8) and of treated water alkalinity for systems meeting the criterion in R18-4-301.02(A)(6).</u></li> </ol> |

**Notices of Final Rulemaking**

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|--|---|
|  | <p><u>7. The running annual average for both TTHM and HAA5 for systems meeting the criterion in R18-4-301.02(A)(3) or (8).</u></p> <p><u>8. The running annual average of the amount of magnesium hardness removal (as CaCO<sub>3</sub>, in mg/L) for systems meeting the criterion in R18-4-301.02(A)(7).</u></p> <p><u>9. Whether the system is in compliance with the particular alternative compliance criterion in R18-4-301.02(A)(1) through (8).</u></p> |
|--|---|

- B.** MCL and MRDL violations: Except as specified in this subsection, a public water system shall report a violation of a MCL or MRDL to the Department within 48 hours of receipt of analytical results that indicate a violation.
1. No change
  2. No change
  3. A public water system shall report a violation of an interim MCL for turbidity to the Department, by telephone or facsimile:
    - a. No change
    - b. Within ~~48~~ 24 hours of receipt of analytical results for the second daily sample if the arithmetic average of the results of daily samples ~~taken~~ collected on two consecutive days exceeds 5 NTUs.
  4. A water supplier shall report an acute violation of the chlorine dioxide MRDL, as specified in R18-4-214.01(K)(3)(a) and R18-4-214.02(J)(3)(a), to the Department, by phone or facsimile as soon as possible but no later than 24 hours after receipt of analytical results that indicate an acute violation.
- C.** No change
1. No change
  2. No change
  3. The date and value of ~~any a~~ a filtered water turbidity measurement ~~taken~~ collected during the month that exceeds ~~5 NTUs; the maximum turbidity limits specified in R18-4-302 for the filtration technology used.~~
  4. If the turbidity of the filtered water exceeds ~~5 NTUs; the maximum turbidity limits specified in R18-4-302 for the filtration technology used,~~ then the ~~water supplier~~ surface water system shall report the exceedance to the Department, by telephone or facsimile, as soon as possible but no later than 24 hours after the exceedance.
- D.** No change
1. No change
  2. No change
  3. No change
  4. No change
- E.** No change
- F.** No change
- G.** No change
- H.** No change
- I.** No change
- J.** No change
- K.** Special monitoring. A public water system, or a contractor that conducts special monitoring required in Article 4, shall report the following information to the Department:
1. For sodium required in R18-4-401, the sodium monitoring results in the first 10 days of the month after the month that the analytical results were received.
  2. For nickel required in R18-4-402, the nickel monitoring results within the first 10 days following the month that the public water system receives the analytical result or the first 10 days following the end of an applicable monitoring period prescribed by R18-4-402, whichever occurs first.
  3. For turbidity monitoring under R18-4-403.
    - a. A system shall report within 10 days after the end of each month the system served water to the public that the continuous turbidity monitoring was conducted.
    - b. A system shall report the continuous turbidity measurements within 10 days after the end of each month the system served water to the public only if measurements demonstrate one or more conditions in R18-4-403(A)(3) through (6). The following information shall be reported:
      - i. The filter number, the turbidity measurement, the date(s) on which the turbidity limit was exceeded.
      - ii. If the system is required to produce a filter profile, the system shall report that the filter profile has been produced, or report the obvious reason for the abnormal filter performance.
      - iii. If the system is required to conduct a filter self-assessment, the system shall report that the filter self-assessment has been conducted.
      - iv. If the system is required to arrange for a comprehensive performance evaluation, the evaluation shall be completed and submitted to the Department no later than 90 days following the exceedance.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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- L. No change
- M. No change
- N. No change
- O. No change
- P. No change
- Q. Copies of public notices. A public water system shall submit to the Department within 10 days after the date of completion of a public notice, a representative copy of each type of public notice required in R18-4-105 and R18-4-105.01 that is distributed, published, posted, or made available to persons served by the public water system or to the media and an affidavit that describes how the public notice was provided.
- R. No change
- S. No change
- T. No change
- U. No change
- V. No change

**R18-4-105. Public Notification Requirements (Repeal May 6, 2002)**

- A. MCL, MRDL, or treatment technique violations: A ~~water supplier of a~~ public water system that fails to comply with an applicable MCL, MRDL, or a treatment technique requirement shall provide public notice to persons served by the system as follows:
  - 1. Publish public notice in a daily newspaper of general circulation in the area served by the system as soon as possible but not later than 14 days after the violation. If the area served by a public water system is not served by a daily newspaper of general circulation, the public water system shall provide public notice by publication in a weekly newspaper of general circulation serving the area; and
  - 2. Mail delivery of a public notice of the violation by direct mail or with the water bill not later than 45 days after the violation. The Department may waive mail delivery of the public notice if the public water system corrects the violation within the 45-day period.
- B. Acute violations: In addition to the public notice requirements prescribed in subsection (A), a ~~water supplier~~ public water system shall provide public notice by television or radio broadcast for an acute violation defined in this subsection. A ~~water supplier~~ public water system shall provide a copy of the public notice to radio and television stations that broadcast to the area served by the system as soon as possible but not later than 72 hours after an acute violation occurs. An acute violation is:
  - 1. A violation of a MCL for total coliform when fecal coliforms or *E. coli* are present as specified in R18-4-202(A)(3) or R18-4-202(A)(4).
  - 2. A violation of the MCL for nitrate or nitrite as specified in R18-4-205.
  - 3. An occurrence of a waterborne disease outbreak that is attributable to water distributed by ~~the~~ a public water system.
  - 4. A violation of the MRDL for chlorine dioxide as specified in R18-4-214.01(C) and determined in R18-4-214.01(K)(3)(a).
- C. Monitoring violations, exemptions, and variances: A ~~water supplier of a~~ public water system that fails to conduct required monitoring, fails to use approved analytical methods, or that obtains an exemption or variance from the Department shall give public notice as follows:
  - 1. Publish public notice in a daily newspaper of general circulation within ~~3~~ three months of the monitoring violation or the grant of an exemption or variance, or
  - 2. If the area served by ~~the~~ a public water system is not served by a daily newspaper of general circulation, a ~~water supplier~~ public water system shall publish the public notice in a weekly newspaper of general circulation serving the area within ~~3~~ three months of the monitoring violation or the grant of an exemption or variance.
- D. Alternative public notification procedures:
  - 1. Community water systems: A ~~water supplier of a community water system~~ CWS that is located in an area that is not served by radio, television, or a daily or weekly newspaper of general circulation shall provide public notice by hand delivery or continuous posting in conspicuous places within the area served by the system. Posting shall continue for a minimum of 10 days and as long as a violation exists or for as long as an exemption or variance remains in effect.
    - a. Acute violations: A ~~water supplier~~ public water system shall provide public notice of an acute violation by hand delivery or posting as soon as possible but not later than 72 hours after an acute violation occurs.
    - b. MCL, MRDL, or treatment technique violations: A ~~water supplier~~ public water system shall provide public notice of a MCL, MRDL, or treatment technique violation by hand delivery or posting within 14 days after a violation occurs.
    - c. Monitoring violations, exemptions, and variances: A ~~water supplier~~ public water system shall provide public notice by hand delivery or by posting within ~~3~~ three months of a monitoring violation or the grant of an exemption or variance by the Department.
  - 2. Noncommunity water systems: Instead of providing public notice as prescribed in subsection (A), (B), or (C), a ~~water supplier of a~~ noncommunity water system may provide public notice by hand delivery or by continuous posting in

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

conspicuous places within the area served by the noncommunity system. Posting shall continue for a minimum of 10 days and for as long as a violation exists or an exemption or variance remains in effect.

- a. Acute violations: A ~~water supplier of a noncommunity water system~~ shall provide public notice by hand delivery or posting as soon as possible but not later than 72 hours after an acute violation occurs;
  - b. MCL, MRDL, or treatment technique violations: A ~~water supplier of a noncommunity water system~~ shall provide public notice by hand delivery or posting within 14 days after a MCL, MRDL, or treatment technique violation occurs.
  - c. Monitoring violations, exemptions, and variances: A ~~water supplier of a noncommunity water system~~ shall provide public notice by hand delivery or posting within ~~3~~ three months of a monitoring violation or the grant of an exemption or variance by the Department.
- E. Repeat public notice: ~~The water supplier~~ A public water system shall give repeat public notice at least once every ~~3~~ three months by mail delivery (by direct mail or with the water bill) for as long as ~~any a~~ any violation exists. ~~The water supplier~~ A public water system shall give repeat public notice of the existence of a variance or exemption every ~~3~~ three months for as long as the variance or exemption remains in effect. For a ~~community water system CWS~~ or a noncommunity water system that provides public notice by posting, repeat public notice requirements are satisfied by continuous posting.
- F. Limited public notice: ~~The water supplier~~ A public water system may give public notice to only a portion of the population served by a public water system if the public water system demonstrates and the Department approves in writing that only a segment of the population served by the public water system is affected by the problem ~~which that~~ results in the need for public notice.
- G. Notice to new customers: A ~~water supplier~~ public water system shall give a copy of the most recent public notice for ~~any outstanding an unresolved~~ violation of a MCL, MRDL, treatment technique requirement, or a violation of a schedule of compliance prescribed pursuant to a variance or exemption to all new billing units or hookups prior to or at the time service begins.
- H. General content of a public notice: ~~Each~~ A public notice shall provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct the violation, the necessity for using alternative water supplies; and any measures the consumer should take to minimize exposure until the violation is corrected. ~~Each~~ A public notice shall be conspicuous and free of unduly technical language, small print, editorial comments, or similar problems that frustrate the purposes of the public notice. ~~Each~~ A public notice shall include the name and telephone number of a person at the public water system who can be contacted for additional information about the public notice. Where appropriate, the public notice shall be multi-lingual.
- I. Mandatory health effects language: A ~~water supplier~~ public water system shall include the mandatory health effects language prescribed in Appendix A in a public notice for the violation of a ~~maximum contaminant level~~ MCL, MRDL, or treatment technique and in a public notice regarding the granting or continued existence of a variance or exemption.
- J. The Department shall not provide public notice on behalf of the ~~water supplier~~ public water system. If a ~~water supplier~~ public water system fails to notify the public in accordance with the requirements, the Department may provide public notice to persons served by the public water system by any of the methods listed in this Section or by issuance of a press release. ~~The water supplier~~ A public water system remains legally responsible for ensuring that the requirements of this Section are met.
- K.** This Section is repealed May 6, 2002.

**R18-4-105.01. Public Notification Requirements (Effective May 6, 2002)**

- A.** A public water system shall give public notice for all violations of this Chapter and for the following situations:
1. Operation under a variance or an exemption.
  2. Failure to comply with the requirements of a schedule that is set under a variance or exemption.
  3. Occurrence of a waterborne disease outbreak or other waterborne emergency as identified in Table 2 item 10.
  4. Distributing water with a concentration of fluoride greater than 2.0 mg/L but less than 4.0 mg/L, and
  5. Availability of data from unregulated contaminant monitoring required by 40 CFR 141.40.
- B.** Public notice requirements are divided into three categories, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved. Table 1 provides the public notice categories. Appendix A identifies the public notice requirement for a specific violation or situation.

**Table 1. Public Notice Categories**

1. Acute (24 hour) public notice - required for violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.
2. Nonacute Level 1 (30 day) public notice - required for violations and situations with potential to have serious adverse effects on human health, but not as a result of short-term exposure.
3. Nonacute Level 2 (12 month) public notice - required for all other violations and situations not included in Acute (24 hour) and Nonacute Level 1 (30 day) public notice.

- C.** A public water system shall provide public notice to persons served by the system, in accordance with this Section.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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1. A public water system that sells or otherwise provides drinking water to a consecutive system is required to give public notice to the consecutive system. The consecutive system is responsible for providing public notice to the persons it serves.
2. A public water system that has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system may request that the Department allow the system to limit distribution of the public notice to persons served by that portion of the system that is out of compliance. The Department's decision to allow limited distribution of the notice shall be in writing.
3. The Department may provide public notice on behalf of the public water system. A public water system remains legally responsible for ensuring that the requirements are met.

**D. Acute (24 hour) Public Notice**

1. Table 2 lists the violations and other situations requiring an Acute (24 hour) public notice.

**Table 2. Violations and Other Situations Requiring an Acute (24 hour) Public Notice**

|   |
|---|
| <ol style="list-style-type: none"><li>1. <u>Violation of the MCL for total coliforms when fecal coliform or <i>E. coli</i> are present in the water distribution system, as specified in R18-4-202(A)(3) or R18-4-202(A)(4);</u></li><li>2. <u>Failure to test for fecal coliforms or <i>E. coli</i> when a repeat sample tests positive for total coliform;</u></li><li>3. <u>Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite in R18-4-205;</u></li><li>4. <u>Failure to take a confirmation sample within 24 hours of the system's receipt of the initial sample showing a violation of the nitrate or nitrite MCL, as specified in R18-4-208(I) and R18-4-209(J);</u></li><li>5. <u>Violation of the nitrate MCL by a noncommunity water system, where permitted to exceed the MCL by the Department under R18-4-205;</u></li><li>6. <u>Violation of the MRDL for chlorine dioxide at the point-of-entry into the distribution system when one or more samples collected in the distribution system the day following a violation of the MRDL</u></li><li>7. <u>Failure to take the required chlorine dioxide samples in the distribution system, as required in R18-4-214.01(J)(2) or R18-4-214.02(I)(2).</u></li><li>8. <u>Violation of the interim MCL for turbidity, as specified in R18-4-204(A)(2), if the Department determines after consultation with the public water system that an Acute (24 hour) public notice is required, for reasons such as the source of turbidity, or if consultation does not take place within 24 hours after the system learns of the violation, subject to subsection (E)(2)(b);</u></li><li>9. <u>Violation of the maximum turbidity limit specified in R18-4-302 for the filtration technology used, if the Department determines after consultation with the public water system that an Acute (24 hour) public notice is required or if consultation does not take place within 24 hours after the system learns of the violation, subject to subsection (E)(2)(b); and</u></li><li>10. <u>Occurrence of a waterborne disease outbreak or other waterborne emergency with significant potential to have serious adverse effects on human health as a result of short-term exposure, such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination.</u></li></ol> |
|---|

2. A public water system shall provide an Acute (24 hour) public notice according to the following procedures:
  - a. Provide a public notice as soon as possible, but no later than 24 hours after the system learns of the violation or situation; and
  - b. Initiate consultation with the Department as soon as possible, but no later than 24 hours after the public water system learns of the violation or situation, to determine additional public notice requirements.
  - c. A public water system shall provide a repeat public notice every three months from the date the water system learns of the violation or situation for as long as the violation or situation exists.
3. A public water system shall provide an Acute (24 hour) public notice in a form and manner reasonably expected to reach all persons served by one or more of the following delivery methods:
  - a. Appropriate broadcast media, including radio and television;
  - b. Posting of the public notice in conspicuous locations throughout the area served by the water system;
  - c. Hand delivery of the public notice to persons served by the water system; or
  - d. Another delivery method approved in writing by the Department.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

**E. Nonacute Level 1 (30 day) Public Notice**

1. Table 3 lists the violations and other situations requiring a Nonacute Level 1 (30 day) public notice.

**Table 3. Violations and Other Situations Requiring a Nonacute Level 1 (30 day) Public Notice**

- |   |
|---|
| <p>1. <u>Violation of a MCL, MRDL, or treatment technique requirement where an Acute (24 hour) public notice is not required;</u></p> <p>2. <u>Violation of a monitoring requirement, if the Department determines that a Nonacute Level 1 (30 day) public notice rather than a Nonacute Level 2 (12 month) public notice is required, taking into account potential health impacts and persistence of the violation; and</u></p> <p>3. <u>Failure to comply with the terms and conditions of a variance or exemption granted to a public water system by the Department.</u></p> |
|---|
2. A public water system shall provide a Nonacute Level 1 (30 day) public notice according to the following procedures:
- a. Provide the public notice as soon as possible, but no later than 30 days after the system learns of the violation. The Department may, in appropriate circumstances, allow additional time for the initial public notice of up to three months from the date the system learns of the violation. The Department shall not grant an extension for an unresolved violation. The Department's decision to grant an extension shall be in writing.
  - b. A public water system that is unable to consult with the Department within 24 hours due to weekends or holidays, may distribute a Nonacute Level 1 (30 day) public notice for a violation of a maximum turbidity limit if one or more of the following is met:
    - i. The water system is able to document that water has been fed to waste and not served to customers,
    - ii. The water system is able to document that water has been recycled and not served to customers, or
    - iii. The water system is able to document that the testing equipment malfunctioned and high turbidity readings were erroneously obtained.
  - c. A public water system shall provide a repeat public notice every three months from the date the water system learns of the violation or situation for as long as the violation or situation exists. The Department may determine that appropriate circumstances warrant a different repeat public notice frequency. The frequency of a reduced repeat public notice shall be at least once a year. The Department's determination to allow a public water system to provide repeat public notices less frequently shall be in writing.
3. A public water system shall provide a Nonacute Level 1 (30 day) public notice in a form and manner reasonably expected to reach all persons served by one or more of the following delivery methods:
- a. A CWS shall provide public notice by:
    - i. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system, and
    - ii. Another public notice delivery method reasonably expected to reach other persons regularly served by the system, if they would not normally be reached by the public notice required in subsection (E)(3)(a)(i). Other methods may include: Publication in a local newspaper, delivery of multiple copies for distribution by customers that provide their drinking water to others (for example, apartment building owners or large private employers), delivery to community organizations, or posting the public notice in public places served by the system or on the internet. A public water system shall post the public notice for at least seven days, or for as long as the violation, variance, exemption, or other situation exists, whichever is longer.
  - b. A noncommunity water system shall provide public notice by:
    - i. Posting the public notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known), and
    - ii. Another public notice delivery method reasonably expected to reach other persons served by the system if they would not normally be reached by the public notice required in subsection (E)(3)(b)(i). Other methods may include: Publication in a local newspaper or newsletter distributed to customers, use of e-mail to notify employees or students, or delivery of multiple copies in central locations such as community centers.

**E. Nonacute Level 2 (12 month) Public Notice**

1. Table 4 lists the violations and other situations requiring a Nonacute Level 2 (12 month) public notice.

**Table 4. Violations and Other Situations Requiring a Nonacute Level 2 (12 month) Public Notice**

- |  |
|--|
| <p>1. <u>Monitoring violations where an Acute (24 hour) public notice or a Nonacute Level 1 (30 day) public notice is not required,</u></p> <p>2. <u>Operation under a variance or an exemption granted by the Department,</u></p> <p>3. <u>Availability of unregulated contaminant monitoring results required by 40 CFR 141.40, and</u></p> <p>4. <u>Distributing water with a concentration of fluoride greater than 2.0 mg/L but less than 4.0 mg/L.</u></p> |
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*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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2. A public water system shall provide a Nonacute Level 2 (12 month) public notice according to the following procedures:
  - a. Provide the public notice no later than one year (12 months) after the public water system learns of the violation or situation or begins operating under a variance or exemption.
  - b. A public water system may use one annual public notice detailing all Nonacute Level 2 violations and situations that occurred during the previous 12 months, rather than individual Nonacute Level 2 (12 month) public notices if the timing requirements in subsection (F)(2)(a) are met.
  - c. A public water system shall repeat the public notice annually for as long as the violation, variance, exemption, or other situation exists.
3. A public water system shall provide a Nonacute Level 2 (12 month) public notice in a form and manner reasonably expected to reach all persons served by one or more of the following delivery methods:
  - a. A CWS shall provide public notice by:
    - i. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system, and
    - ii. Another public notice delivery method reasonably expected to reach other persons regularly served by the system, if they would not normally be reached by the public notice required in subsection (F)(3)(a)(i). Other methods may include: Publication in a local newspaper, delivery of multiple copies for distribution by customers that provide their drinking water to others (for example, apartment building owners or large private employers), delivery to community organizations, or posting the public notice in public places or on the internet. A public water system shall post the public notice for at least seven days, or for as long as the violation, variance, exemption, or other situation exists, whichever is longer.
    - iii. A CWS may use the CCR as a vehicle for the initial Nonacute Level 2 (12 month) public notice and all required repeat public notices, as long as the timing, content, and distribution requirements of this subsection are met.
  - b. A noncommunity water system shall provide public notice by:
    - i. Posting the public notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known), and
    - ii. Another public notice delivery method reasonably expected to reach other persons served by the system, if they would not normally be reached by the public notice required in subsection (F)(3)(b)(i). Other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of e-mail to notify employees or students; or, delivery of multiple copies in central locations (for example, community centers).

**G.** Notice to new customers or billing units:

1. A CWS shall give a copy of the most recent public notice for a continuing violation, the existence of a variance or exemption, or other ongoing situation requiring a public notice to all new billing units or new customers prior to or at the time service begins.
2. A noncommunity water system shall continuously post the public notice in conspicuous locations throughout the area served by the water system in order to inform new customers of a continuing violation, variance or exemption, or other situation requiring a public notice for as long as the violation, variance, exemption, or other situation exists.

**H.** Content of the Public Notice

1. A public notice shall contain the following elements:
  - a. A description of the violation or situation, including the contaminant(s) of concern, and, as applicable, the contaminant level(s);
  - b. When the violation or situation occurred;
  - c. Any potential adverse health effects from the violation or situation, including the information in subsection (H)(5)(a) or (H)(5)(b), as applicable;
  - d. The population at risk, if known, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;
  - e. Whether alternative water supplies should be used;
  - f. What actions consumers should take, including when they should seek medical help, if known;
  - g. What the system is doing to correct the violation or situation;
  - h. When the water system expects to return to compliance or resolve the situation;
  - i. The name, business address, and phone number of the public water system owner, operator, or designee of the public water system as a source of additional information concerning the public notice; and
  - j. A statement to encourage the public notice recipient to distribute the public notice to other persons served using the standard language in subsection (H)(5)(c), as applicable.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

2. For a public water system that has been granted a variance or an exemption, the public notice shall contain the following:
  - a. An explanation of the reasons for the variance or exemption;
  - b. The date on which the variance or exemption was issued;
  - c. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and
  - d. A notice of opportunity for public input in the review of the variance or exemption.
3. A public notice required by this Section:
  - a. Shall be displayed in a conspicuous way when printed or posted,
  - b. Shall not contain overly technical language or very small print,
  - c. Shall not be formatted in a way that defeats the purpose of the public notice, and
  - d. Shall not contain language that nullifies the purpose of the public notice.
4. A public water system that serves a large proportion of non-English speaking consumers, as determined by the public water system after consultation with the Department, shall include information in the appropriate language regarding the importance of the public notice or include a telephone number or address where persons served may contact the water system to obtain a translated copy of the public notice or to request assistance in the appropriate language.
5. A public water system shall include the following language in a public notice:
  - a. For violations of a MCL, MRDL, treatment technique, or the condition of a variance or exemption, the public notice shall include the health effects language in Appendix A.
  - b. For violations of a monitoring requirement, the public notice shall include the following language and the language necessary to fill in the information in the parentheses:

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we [did not monitor or test] or [did not complete all monitoring or testing] for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time.
  - c. For a public water system that supplies water to a customer that distributes water to others:

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.
6. A public water system that is required to monitor for unregulated contaminants, as specified in 40 CFR § 141.40, shall include information on the availability of unregulated contaminant monitoring results in the public notice.

**I. This Section is effective May 6, 2002.**

**Appendix A. Mandatory Health Effects Language Regulated Contaminants**

- (1) ~~Acrylamide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that acrylamide is a health concern at certain levels of exposure. Polymers made from acrylamide are sometimes used to treat water supplies to remove particulate contaminants. Acrylamide has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. Sufficiently large doses of acrylamide are known to cause neurological injury. EPA has set the drinking water standard for acrylamide using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of acrylamide in the polymer and the amount of the polymer which may be added to drinking water to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to acrylamide.~~
- (2) ~~Alachlor. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that alachlor is a health concern at certain levels of exposure. This organic chemical is a widely used pesticide. When soil and climatic conditions are favorable, alachlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for alachlor at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to alachlor.~~
- (3) ~~Antimony. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that antimony is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in soils, groundwater and surface waters and is often used in the flame retardant industry. It is also used in ceramics, glass, batteries, fireworks, and explosives. It may get into drinking water through natural weathering of rock, industrial production, municipal waste disposal, or manufacturing processes. This chemical has been shown to decrease longevity, and alter blood levels of cholesterol and glucose in laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the~~

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

drinking water standard for antimony at 0.006 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to antimony.

- (4) **Asbestos.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that asbestos fibers greater than 10 micrometers in length are a health concern at certain levels of exposure. Asbestos is a naturally occurring mineral. Most asbestos fibers in drinking water are less than 10 micrometers in length and occur in drinking water from natural sources and from corroded asbestos cement pipes in the distribution system. The major uses of asbestos were in the production of cements, floor tiles, paper products, paint, and caulking; in transportation-related applications; and in the production of textiles and plastics. Asbestos was once a popular insulating and fire-retardant material. Inhalation studies have shown that various forms of asbestos have produced lung tumors in laboratory animals. The available information on the risk of developing gastrointestinal tract cancer associated with the ingestion of asbestos from drinking water is limited. Ingestion of intermediate-range chrysotile asbestos fibers greater than 10 micrometers in length is associated with causing benign tumors in male rats. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for asbestos at 7 million long fibers per liter to reduce the potential risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to asbestos.
- (5) **Atrazine.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that atrazine is a health concern at certain levels of exposure. This organic chemical is a herbicide. When soil and climatic conditions are favorable, atrazine may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to affect offspring of rats and the heart of dogs. EPA has set the drinking water standard for atrazine at 0.003 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to atrazine.
- (6) **Barium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that barium is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in some aquifers that serve as sources of groundwater. It is also used in oil and gas drilling muds, automotive paints, bricks, tiles, and jet fuels. It generally gets into drinking water after dissolving from naturally occurring minerals in the ground. This chemical may damage the heart and cardiovascular system and is associated with high blood pressure in laboratory animals such as rats exposed to high levels during their lifetimes. In humans, EPA believes that effects from barium on blood pressure should not occur below 2 parts per million (ppm) in drinking water. EPA has set the drinking water standard for barium at 2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to barium.
- (7) **Benzene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the benzene is a health concern at certain levels of exposure. This chemical is used as a solvent and degreaser of metals. It is also a major component of gasoline. Drinking water contamination generally results from leaking underground gasoline and petroleum tanks or improper waste disposal. This chemical has been associated with significantly increased risks of leukemia among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for benzene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (8) **Benzo[a]pyrene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that benzo[a]pyrene is a health concern at certain levels of exposure. Cigarette smoke and charbroiled meats are common sources of general exposure. The major source of benzo[a]pyrene in drinking water is the leaching from coal tar lining and sealants in water storage tanks. This chemical has been shown to cause cancer in animals such as rats and mice when the animals are exposed at high levels. EPA has set the drinking water standard for benzo[a]pyrene at 0.0002 parts per million (ppm) to protect against the risk of cancer. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to benzo[a]pyrene.
- (9) **Beryllium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that beryllium is a health concern at certain levels of exposure. This inorganic metal occurs naturally in soils, groundwater, and surface waters and is often used in electrical equipment and electrical components. It generally gets into water from runoff from mining operations, discharge from processing plants, and improper waste disposal. Beryllium compounds have been associated with damage to the bones and lungs and induction of cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. There is limited evidence to suggest that beryllium may pose a cancer risk via drinking water exposure. Therefore, EPA based the health assessment on noncancer effects with an extra uncertainty factor to account for possible carcinogenicity. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drink-

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

ing water standard for beryllium at 0.004 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to beryllium.

- (10) Cadmium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that cadmium is a health concern at certain levels of exposure. Food and the smoking of tobacco are common sources of general exposure. This inorganic metal is a contaminant in the metals used to galvanize pipe. It generally gets into water for corrosion of galvanized pipes or by improper waste disposal. This chemical has been shown to damage the kidney in animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the kidney. EPA has set the drinking water standard for cadmium at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cadmium.
- (11) Carbofuran. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that carbofuran is a health concern at certain levels of exposure. This organic chemical is a pesticide. When soil and climatic conditions are favorable, carbofuran may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the nervous and reproductive systems of laboratory animals such as rats and mice exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the nervous system. Effects on the nervous system are generally rapidly reversible. EPA has set the drinking water standard for carbofuran at 0.04 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to carbofuran.
- (12) Carbon tetrachloride. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that carbon tetrachloride is a health concern at certain levels of exposure. This chemical was once a popular household cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for carbon tetrachloride at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (13) Chlordane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlordane is a health concern at certain levels of exposure. This organic chemical is a pesticide used to control termites. Chlordane is not very mobile in soils. It usually gets into drinking water after application near water supply intakes or wells. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for chlordane at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to chlordane.
- (14) Chromium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chromium is a health concern at certain levels of exposure. The inorganic metal occurs naturally in the ground and is often used in the electroplating of metals. It generally gets into water from runoff from old mining operations and improper waste disposal from plating operations. This chemical has been shown to damage the kidney, nervous system, and the circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels. Some humans who were exposed to high levels of this chemical suffered liver and kidney damage, dermatitis, and respiratory problems. EPA has set the drinking water standard for chromium at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to chromium.
- (15) Copper. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that copper is a health concern at certain exposure levels. Copper, a reddish brown metal, is often used to plumb residential and commercial structures that are connected to water distribution systems. Copper contaminating drinking water as a corrosion by-product occurs as the result of the corrosion of copper pipes that remain in contact with water for a prolonged period of time. Copper is an essential nutrient, but at high doses it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia. Persons with Wilson's disease may be at a higher risk of health effects due to copper than the general public. EPA's national primary drinking water regulation requires all public water systems to install optimal corrosion control to minimize copper contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have copper concentrations below 1.3 parts per million (ppm) in more than 90% of tap water samples (the EPA "action level") are not required to install or improve their treatment. Any water

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

system that exceeds the action level must also monitor their source water to determine whether treatment to remove copper in source water is needed.

- (16) Cyanide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that cyanide is a health concern at certain levels of exposure. This inorganic chemical is used in electroplating, steel processing, plastics, synthetic fabrics, and fertilizer products. It usually gets into water as a result of improper waste disposal. This chemical has been shown to damage the spleen, brain, and liver of humans fatally poisoned with cyanide. EPA has set the drinking water standard for cyanide at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to cyanide.
- (17) 2,4-D. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 2,4-D is a health concern at certain levels of exposure. This organic chemical is used as a herbicide and to control algae in reservoirs. When soil and climatic conditions are favorable, 2,4-D may get into drinking water by runoff into surface water or by leaching into groundwater. The chemical has been shown to damage the liver and kidney of laboratory animals such as rats exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4-D at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4-D.
- (18) Dalapon. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dalapon is a health concern at certain levels of exposure. This organic chemical is a widely used herbicide. It may get into drinking water after application to control grasses in crops, drainage ditches, and along railroads. This chemical has been shown to cause damage to the kidney and liver in laboratory animals when the animals are exposed to high levels over their lifetimes. EPA has set the drinking water standard for dalapon at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dalapon.
- (19) Dibromochloropropane (DBCP). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that DBCP is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, dibromochloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for DBCP at 0.0002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to DBCP.
- (20) o-Dichlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that o-dichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a solvent in the production of pesticides and dyes. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidney, and the blood cells of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the liver, nervous system, and circulatory system. EPA has set the drinking water standard for o-dichlorobenzene at 0.6 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to o-dichlorobenzene.
- (21) Para-dichlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that para-dichlorobenzene is a health concern at certain levels of exposure. This chemical is a component of deodorizers, moth balls, and pesticides. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for para-dichlorobenzene at 0.075 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (22) 1,2-Dichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2-dichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaning fluid for fats, oils, waxes, and resins. It generally gets into drinking water from improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,2-dichloroethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

- (23) 1,1-Dichloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,1-dichloroethylene is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,1-dichloroethylene at 0.007 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (24) cis-1,2-Dichloroethylene. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that cis-1,2-Dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for cis-1,2-dichloroethylene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cis-1,2-dichloroethylene.
- (25) trans-1,2-Dichloroethylene. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that trans-1,2-dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and the circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set drinking water standard for trans-1,2-dichloroethylene at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to trans-1,2-dichloroethylene.
- (26) Dichloromethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dichloromethane (methylene chloride) is a health concern at certain levels of exposure. This organic chemical is a widely used solvent. It is used in the manufacture of paint remover, as a metal degreaser, and as an aerosol propellant. It generally gets into drinking water after improper discharge of waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dichloromethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe with respect to dichloromethane.
- (27) 1,2-Dichloropropane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2-dichloropropane is a health concern at certain levels of exposure. This organic chemical is used as a solvent and pesticide. When soil and climate conditions are favorable, 1,2-dichloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. It may also get into drinking water through improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for 1,2-dichloropropane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 1,2-dichloropropane.
- (28) Di(2-ethylhexyl)adipate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that di(2-ethylhexyl)adipate is a health concern at certain levels of exposure. Di(2-ethylhexyl)adipate is a widely used plasticizer in a variety of products, including synthetic rubber, food packaging materials, and cosmetics. It may get into drinking water after improper waste disposal. This chemical has been shown to damage liver and testes in laboratory animals such as rats and mice exposed to high levels. EPA has set the drinking water standard for di(2-ethylhexyl)adipate at 0.4 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standards is associated with little to none of this risk and should be considered safe with respect to di(2-ethylhexyl)adipate.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

- (29) Di(2-ethylhexyl)phthalate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that di(2-ethylhexyl)phthalate is a health concern at certain levels of exposure. Di(2-ethylhexyl)phthalate is a widely used plasticizer, which is primarily used in the production of polyvinyl chloride (PVC) resins. It may get into drinking water after improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice exposed to high levels over their lifetimes. EPA has set the drinking water standard for di(2-ethylhexyl)phthalate at 0.006 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to di(2-ethylhexyl)phthalate.
- (30) Dinoseb. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dinoseb is a health concern at certain levels of exposure. Dinoseb is a widely used pesticide and generally gets into drinking water after application on orchards, vineyards, and other crops. This chemical has been shown to damage the thyroid and reproductive organs in laboratory animals such as rats exposed to high levels. EPA has set the drinking water standard for dinoseb at 0.007 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dinoseb.
- (31) Diquat. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that diquat is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to damage the liver, kidney, and gastrointestinal tract and causes cataract formation in laboratory animals such as dogs and rats exposed at high levels over their lifetimes. EPA has set the drinking water standard for diquat at 0.02 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to diquat.
- (32) Endothall. The United States Environmental Protection Agency (EPA) has determined that endothall is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into water by runoff into surface water. This chemical has been shown to damage the liver, kidney, gastrointestinal tract, and reproductive system of laboratory animals such as rats and mice exposed at high levels over their lifetimes. EPA has set the drinking water standard for endothall at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endothall.
- (33) Endrin. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that endrin is a health concern at certain levels of exposure. This organic chemical is a pesticide no longer registered for use in the United States. However, this chemical is persistent in treated soils and accumulates in sediments and aquatic and terrestrial biota. This chemical has been shown to cause damage to the liver, kidney, and heart in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for endrin at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endrin.
- (34) Epichlorohydrin. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that epichlorohydrin is a health concern at certain levels of exposure. Polymers made from epichlorohydrin are sometimes used in the treatment of water supplies as a flocculent to remove particulates. Epichlorohydrin generally gets into drinking water by improper use of these polymers. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are expected over long periods of time. EPA has set the drinking water standard for epichlorohydrin using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of epichlorohydrin in the polymer and the amount of the polymer which may be added to drinking water as a flocculent to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to epichlorohydrin.
- (35) Ethylbenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined ethylbenzene is a health concern at certain levels of exposure. This organic chemical is a major component of gasoline. It generally gets into water by improper waste disposal or leaking gasoline tanks. This chemical has been shown to damage the kidney, liver, and nervous system of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for ethylbenzene at 0.7 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to ethylbenzene.
- (36) Ethylene dibromide (EDB). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that EDB is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, EDB may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for EDB at 0.00005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to EDB.

- (37) **Fecal Coliforms/*E. coli*.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms or *E. coli* is a serious health concern. Fecal coliforms and *E. coli* are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria in drinking water is generally a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for fecal coliforms and *E. coli* to reduce the risk of these adverse health effects. Under this standard all drinking water samples must be free of these bacteria. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe. State and local health authorities recommend that consumers take the following precautions: [To be inserted by the public water system, according to instructions from state or local authorities].
- (38) **Fluoride.** The notice shall contain the following language including the language necessary to replace footnotes 1, 2 (if applicable), and 3:

Dear User,

The U.S. Environmental Protection Agency requires that we send you this notice on the level of fluoride in your drinking water. The drinking water in your community has a fluoride concentration of 1 milligram per liter (mg/L). Federal regulations require that fluoride, which occurs naturally in your water supply, not exceed a concentration of 4.0 mg/L in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 mg/L for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Federal law also requires that we notify you when monitoring indicates that the fluoride in your drinking water exceeds 2.0 mg/L. This is intended to alert families about dental problems that might affect children under 9 years of age. The fluoride concentration of your water exceeds this federal guideline.

Fluoride in children's drinking water at levels of approximately 1.0 mg/L reduces the number of dental cavities. However, children exposed to levels of fluoride greater than about 2.0 mg/L may develop dental fluorosis. Dental fluorosis, in its moderate to severe forms, is a brown staining and pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride. Families with children under the age of 9 are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given below. Low fluoride bottled drinking water that would meet all standards is also commercially available.

(If a violation of the MCL (4.0 mg/L) has occurred, the following sentence must also be included: The following steps are being taken to come into compliance with the MCL for fluoride:<sup>2</sup>)

For further information, contact<sup>3</sup> at your public water system.

<sup>1</sup>PWS shall insert the compliance result which triggered notification under this part.

<sup>2</sup>If a MCL violation occurred, PWS shall insert steps which are being taken to come into compliance with the fluoride MCL.

<sup>3</sup>PWS shall insert the name, address, and telephone number of a contact person at the PWS.

- (39) **Glyphosate.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that glyphosate is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control grasses and weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to cause damage to the liver and kidneys in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for glyphosate at 0.7 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to glyphosate.
- (40) **Heptachlor.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that heptachlor is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor at 0.0004 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor.

- (41) Heptachlor epoxide. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that heptachlor epoxide is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor epoxide may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor epoxide at 0.0002 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor epoxide.
- (42) Hexachlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that hexachlorobenzene is a health concern at certain levels of exposure. This organic chemical is produced as an impurity in the manufacture of certain solvents and pesticides. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for hexachlorobenzene at 0.001 parts per million (ppm) to protect against the risk of cancer and other adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorobenzene.
- (43) Hexachlorocyclopentadiene. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that hexachlorocyclopentadiene is a health concern at certain levels of exposure. This organic chemical is used as an intermediate in the manufacture of pesticides and flame retardants. It may get into water by discharge from production facilities. This chemical has been shown to damage the kidney and the stomach of laboratory animals when exposed at high levels over their lifetimes. EPA has set the drinking water standard for hexachlorocyclopentadiene at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorocyclopentadiene.
- (44) Lead. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that lead is a health concern at certain exposure levels. Materials that contain lead have frequently been used in the construction of water supply distribution systems, and plumbing systems in private homes and other buildings. The most commonly found materials include service lines, pipes, brass and bronze fixtures, and solders and fluxes. Lead in these materials can contaminate drinking water as a result of the corrosion that takes place when water comes into contact with those materials. Lead can cause a variety of adverse health effects in humans. At relatively low levels of exposure, these effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children, and slight increases in the blood pressure of some adults. EPA's national primary drinking water regulation requires all public water systems to optimize corrosion control to minimize lead contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have lead concentrations below 15 parts per billion (ppb) in more than 90% of tap water samples (the EPA "action level") have optimized their corrosion control treatment. Any water system that exceeds the action level must also monitor their source water to determine whether treatment to remove lead in source water is needed. Any water system that continues to exceed the action level after installation of corrosion control and/or source water treatment must eventually replace all lead service lines contributing in excess of 15 ppb of lead to drinking water. Any water system that exceeds the action level must also undertake a public education program to inform consumers of ways they can reduce their exposure to potentially high levels of lead in drinking water.
- (45) Lindane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that lindane is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, lindane may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver, kidney, nervous system, and immune system of laboratory animals such as rats, mice, and dogs exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system and circulatory system. EPA has established the drinking water standard for lindane at 0.0002 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to lindane.
- (46) Mercury. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that mercury is a health concern at certain levels of exposure. This inorganic metal is used in electrical equipment and some water pumps. It usually gets into water as a result of improper waste disposal. This chemical has been shown to

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

damage the kidney of laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for mercury at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to mercury.

- (47) Methoxychlor. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that methoxychlor is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, methoxychlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver, kidney, nervous system, and reproductive system of laboratory animals such as rats exposed at high levels during their lifetimes. It has also been shown to produce growth retardation in rats. EPA has set the drinking water standard for methoxychlor at 0.04 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to methoxychlor.
- (48) Microbiological contaminants [for use when there is a violation of the treatment technique requirements for filtration and disinfection, R18-4-302 or R18-4-303]. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of microbiological contaminants are a health concern at certain levels of exposure. If water is inadequately treated, microbiological contaminants in that water may cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water but also may be caused by a number of factors other than your drinking water. EPA has set enforceable requirements for treating drinking water to reduce the risk of these adverse health effects. Treatment such as filtering and disinfecting the water removes or destroys microbiological contaminants. Drinking water which is treated to meet EPA requirements is associated with little to none of this risk and should be considered safe.
- (49) Monochlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that monochlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a solvent. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidney, and nervous system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. EPA has set the drinking water standard for monochlorobenzene at 0.1 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to monochlorobenzene.
- (50) Nitrate. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nitrate poses an acute health concern at certain levels of exposure. Nitrate is used in fertilizer and is found in sewage and wastes from human and/or farm animals and generally gets into drinking water from those activities. Excessive levels of nitrate in drinking water have caused serious illness and sometimes death in infants under 6 months of age. The serious illness in infants is caused because nitrate is converted to nitrite in the body. Nitrite interferes with the oxygen-carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly in infants. In most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. Local and state health authorities are the best source for information concerning alternate sources of drinking water for infants. EPA has set the drinking water standard at 10 parts per million (ppm) for nitrate to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrite at 1 ppm. To allow for the fact that the toxicity of nitrate and nitrite are additive, EPA has also established a standard for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrate.
- (51) Nitrite. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nitrite poses an acute health concern at certain levels of exposure. This inorganic chemical is used in fertilizers and is found in sewage and wastes from humans and/or farm animals and generally gets into drinking water as a result of those activities. While excessive levels of nitrite in drinking water have not been observed, other sources of nitrite have caused serious illness and sometimes death in infants under 6 months of age. The serious illness in infants is caused because nitrite interferes with the oxygen-carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly. However, in most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. EPA has set the drinking water standard at 1 part per million (ppm) for nitrite to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrate (converted to nitrite in humans) at 10 ppm and for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrite.
- (52) Oxamyl. The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that oxamyl is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for the control of insects and other pests. It may get into drinking water by runoff into surface water or leaching into groundwater.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

This chemical has been shown to damage the kidneys of laboratory animals such as rats when exposed at high levels over their lifetimes. EPA has set the drinking water standard for oxamyl at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to oxamyl.

- (53) Pentachlorophenol. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that pentachlorophenol is a health concern at certain levels of exposure. This organic chemical is used as a wood preservative, herbicide, disinfectant, and defoliant. It generally gets into drinking water by runoff into surface water or leaching into groundwater. This chemical has been shown to produce adverse reproductive effects and to damage the liver and kidneys of laboratory animals such as rats exposed to high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the liver and kidneys. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for pentachlorophenol at 0.001 parts per million (ppm) to protect against the risk of cancer or other adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to pentachlorophenol.
- (54) Pictoram. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that pictoram is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for broadleaf weed control. It may get into drinking water by runoff into surface water or leaching into groundwater as a result of pesticide application and improper waste disposal. This chemical has been shown to cause damage to the kidneys and liver in laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for pictoram at 0.5 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to pictoram.
- (55) Polychlorinated biphenyls (PCBs). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that polychlorinated biphenyls (PCBs) are a health concern at certain levels of exposure. These organic chemicals were once widely used in electrical transformers and other industrial equipment. They generally get into drinking water by improper waste disposal or leaking electrical industrial equipment. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for PCBs at 0.0005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to PCBs.
- (56) Selenium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that selenium is a health concern at certain high levels of exposure. Selenium is also an essential nutrient at low levels of exposure. This inorganic chemical is found naturally in food and soils and is used in electronics, photocopy operations, the manufacture of glass, chemicals, drugs, and as a fungicide and a feed additive. In humans, exposure to high levels of selenium over a long period of time has resulted in a number of adverse health effects, including a loss of feeling and control in the arms and legs. EPA has set the drinking water standard for selenium at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to selenium.
- (57) Simazine. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that simazine is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control annual grasses and broadleaf weeds. It may leach into groundwater or runs off into surface water after application. This chemical may cause cancer in laboratory animals such as rats and mice exposed at high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for simazine at 0.004 parts per million (ppm) to reduce the risk of cancer or other adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to simazine.
- (58) Styrene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that styrene is a health concern at certain levels of exposure. This organic chemical is commonly used to make plastics and is sometimes a component of resins used for drinking water treatment. Styrene may get into drinking water from improper waste disposal. This chemical has been shown to damage the liver and nervous system in laboratory animals when exposed at high levels during their lifetimes. EPA has set the drinking water standard for styrene at 0.1 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to styrene.
- (59) 2,3,7,8-TCDD (Dioxin). The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dioxin is a health concern at certain levels of exposure. This organic chemical is an impurity in the production of some pesticides. It may get into drinking water by industrial discharge of wastes. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

---

lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dioxin at 0.00000003 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe with respect to dioxin.

- (60) Tetrachloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that tetrachloroethylene is a health concern at certain levels of exposure. This organic chemical has been a popular solvent, particularly for dry cleaning. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for tetrachloroethylene at 0.005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to tetrachloroethylene.
- (61) Thallium. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that thallium is a health concern at certain high levels of exposure. This inorganic metal is found naturally in soils and is used in electronics, pharmaceuticals, and the manufacture of glass and alloys. This chemical has been shown to damage the kidney, liver, brain, and intestines of laboratory animals when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for thallium at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to thallium.
- (62) Toluene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that toluene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and in the manufacture of gasoline for airplanes. It generally gets into water by improper waste disposal or leaking underground storage tanks. This chemical has been shown to damage the kidney, nervous system, and circulatory system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relative large amounts of this chemical during working careers also suffered damage to the liver, kidney, and nervous system. EPA has set the drinking water standard for toluene at 1 part per million (ppm) to protect against the risk of adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to toluene.
- (63) Total coliforms [To be used when there is a violation of R18-4-202(A)(1) or R18-4-202(A)(2)] The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of total coliforms is a possible health concern. Total coliforms are common in the environment and are generally not harmful themselves. The presence of these bacteria in drinking water, however, generally is a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. The symptoms, however, are not just associated with disease-causing organisms in drinking water but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for total coliforms to reduce the risk of these adverse health effects. Under this standard, no more than 5.0% of the samples collected during a month can contain these bacteria, except that systems collecting fewer than 40 samples/month that have 1 total coliform-positive sample per month are not violating the standard. Drinking water which meets this standard is usually not associated with a health risk from disease-causing bacteria and should be considered safe.
- (64) Toxaphene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that toxaphene is a health concern at certain levels of exposure. This organic chemical was once a pesticide widely used on cotton, corn, soybeans, pineapples, and other crops. When soil and climatic conditions are favorable, toxaphene may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for toxaphene at 0.003 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to toxaphene.
- (65) 2,4,5-TP. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 2,4,5-TP is a health concern at certain levels of exposure. This organic chemical is used as a herbicide. When soil and climatic conditions are favorable, 2,4,5-TP may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver and kidney of laboratory animals such as rats and dogs exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4,5-TP at 0.05 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4,5-TP.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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- (66) 1,2,4-Trichlorobenzene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2,4-trichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a dye carrier and as a precursor in herbicide manufacture. It generally gets into drinking water by discharges from industrial activities. This chemical has been shown to cause damage to several organs, including the adrenal glands. EPA has set the drinking water standard for 1,2,4-trichlorobenzene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,2,4-trichlorobenzene.
- (67) 1,1,1-Trichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the 1,1,1-trichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaner and degreaser of metals. It generally gets into drinking water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the liver, nervous system, and circulatory system. Chemicals which cause adverse effects among exposed industrial workers and in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,1,1-trichloroethane at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (68) 1,1,2-Trichloroethane. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined 1,1,2-trichloroethane is a health concern at certain levels of exposure. This organic chemical is an intermediate in the production of 1,1-dichloroethylene. It generally gets into water by industrial discharge of wastes. This chemical has been shown to damage the kidney and liver of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for 1,1,2-trichloroethane at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,1,2-trichloroethane.
- (69) Trichloroethylene. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that trichloroethylene is a health concern at certain levels of exposure. This chemical is a common metal cleaning and dry cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set forth the enforceable drinking water standard for trichloroethylene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe.
- (70) Vinyl chloride. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that vinyl chloride is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been associated with significantly increased risks of cancer among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for vinyl chloride at 0.002 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (71) Xylenes. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that xylene is a health concern at certain levels of exposure. This organic chemical is used in the manufacture of gasoline for airplanes and as a solvent for pesticides, and as a cleaner and degreaser of metals. It usually gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidney, and nervous system of laboratory animals such as rats and dogs exposed to high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for xylene at 10 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to xylene.

**Notices of Final Rulemaking**

*(Key for explanation of acronyms and endnotes is at the end of the appendix.)*

**Part 1. Microbiological Contaminants**

| <u>Microbiological Contaminants</u> | <u>MCL</u>  | <u>MCLG</u> | <u>Major Sources in Drinking Water</u> | <u>Mandatory Health Language</u>   | <u>Type of PN* required</u> |                |
|-------------------------------------|---|-------------|--|--|-----------------------------|----------------|
|                                     |   |             |  |  | <u>MCL*</u>                 | <u>Monit.*</u> |
| <u>Total Coliform Bacteria</u>      | Presence of coliform bacteria in 5% or more of monthly samples (CWSs that collect 40 or more samples per month); one positive monthly sample (CWSs that collect fewer than 40 samples per month). | 0           | Naturally present in the environment.  | Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.  | NAL1                        | NAL2           |
| <u>Fecal coliform and E. coli</u>   | A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive  | 0           | Human and animal fecal waste.          | Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems. | AC                          | AC, NAL2       |
| <u>Turbidity</u>                    | Treatment Technique as specified in R18-4-302   | N/A         | Soil Run-off                           | Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.                                  | NAL1, AC                    | NAL2           |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

**Part 2. Radiochemicals**

| <u>Radiochemicals</u>          | <u>MCL</u>                 | <u>MCLG</u> | <u>Major Sources in Drinking Water</u>         | <u>Mandatory Health Language</u>  | <u>Type of PN* required</u> |                |
|--------------------------------|----------------------------|-------------|--|---|-----------------------------|----------------|
|                                |                            |             |  |   | <u>MCL*</u>                 | <u>Monit.*</u> |
| <u>Beta/photon emitters</u>    | <u>4 millirems/Year</u>    | <u>0</u>    | <u>Decay of natural and man-made deposits.</u> | <u>Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.</u> | <u>NAL1</u>                 | <u>NAL2</u>    |
| <u>Alpha emitters</u>          | <u>15 picocuries/Liter</u> | <u>0</u>    | <u>Erosion of natural deposits.</u>            | <u>Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.</u>                     | <u>NAL1</u>                 | <u>NAL2</u>    |
| <u>Combined radium 226/228</u> | <u>5 picocuries/Liter</u>  | <u>0</u>    | <u>Erosion of natural deposits.</u>            | <u>Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.</u>  | <u>NAL1</u>                 | <u>NAL2</u>    |

**Part 3. Disinfectants and Disinfection Byproducts**

| <u>Disinfectants and Disinfection Byproducts</u> | <u>MCL / MRDL in mg/L (MCL unless MRDL specified)</u> | <u>MCLG in mg/L</u> | <u>Major Sources in Drinking Water</u>           | <u>Mandatory Health Language</u>   | <u>Type of PN* required</u> |                |
|--|---|---------------------|--|--|-----------------------------|----------------|
|  |   |                     |  |  | <u>MCL* or MRDL*</u>        | <u>Monit.*</u> |
| <u>Bromate</u>                                   | <u>.010</u>   | <u>0</u>            | <u>By-product of drinking water chlorination</u> | <u>Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.</u> | <u>NAL1</u>                 | <u>NAL2</u>    |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|                                |  |                    |  |   |                   |                       |
|--------------------------------|--|--------------------|--|---|-------------------|-----------------------|
| <u>Chloramines</u>             | <u>MRDL = 4.0</u>                      | <u>MRDLG = 4.0</u> | <u>Water additive used to control microbes</u>   | <u>Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.</u>   | <u>NAL1</u>       | <u>NAL2</u>           |
| <u>Chlorine</u>                | <u>MRDL = 4.0</u>                      | <u>MRDLG = 4.0</u> | <u>Water additive used to control microbes</u>   | <u>Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.</u>   | <u>NAL1</u>       | <u>NAL2</u>           |
| <u>Chlorine dioxide</u>        | <u>MRDL = .8</u>                       | <u>MRDLG = .8</u>  | <u>Water additive used to control microbes</u>   | <u>Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. See endnote (a).</u> | <u>AC, NAL1</u>   | <u>AC, NAL1, NAL2</u> |
| <u>Chlorite</u>                | <u>1</u>                               | <u>.8</u>          | <u>By-product of drinking water chlorination</u> | <u>Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.</u>                                    | <u>NAL1, NAL2</u> |                       |
| <u>Haloacetic Acids (HAA5)</u> | <u>.060</u><br><u>See endnote (b).</u> | <u>N/A</u>         | <u>By-product of drinking water disinfection</u> | <u>Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.</u>   | <u>NAL1</u>       | <u>NAL2</u>           |

**Arizona Administrative Register**

**Notices of Final Rulemaking**

|                                  |  |     |   |  |      |      |
|----------------------------------|--|-----|---|--|------|------|
| TTHMs<br>(Total trihalomethanes) | .10 or .080<br><i>See endnote (c).</i> | N/A | Byproduct of drinking water chlorination. | Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer. | NAL1 | NAL2 |
|----------------------------------|--|-----|---|--|------|------|

**Part 4. Inorganic Contaminants**

| <b><u>Inorganic Contaminants</u></b> | <b><u>MCL in mg/L</u></b>    | <b><u>MCLG in mg/L</u></b> | <b><u>Major Sources in Drinking Water</u></b>   | <b><u>Mandatory Health Language</u></b>   | <b><u>Type of PN* required</u></b> |                       |
|--------------------------------------|------------------------------|----------------------------|---|---|------------------------------------|-----------------------|
|                                      |                              |                            |   |   | <b><u>MCL*</u></b>                 | <b><u>Monit.*</u></b> |
| <u>Antimony</u>                      | .006                         | .006                       | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.                                      | Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.                                       | NAL1                               | NAL2                  |
| <u>Arsenic</u>                       | .05                          | N/A                        | Erosion of natural deposits; Run-off from orchards; Run-off from glass and electronics production wastes.                 | Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. | NAL1                               | NAL2                  |
| <u>Asbestos</u>                      | 7 million fibers/Liter (MFL) | 7 MFL                      | Decay of asbestos cement water mains; Erosion of natural deposits.  | Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.   | NAL1                               | NAL2                  |
| <u>Barium</u>                        | 2                            | 2                          | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.                               | Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.  | NAL1                               | NAL2                  |
| <u>Beryllium</u>                     | .004                         | .004                       | Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries. | Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.  | NAL1                               | NAL2                  |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|   |                           |             |  |  |             |             |
|---|---------------------------|-------------|--|--|-------------|-------------|
| <u>Cadmium</u>  | <u>.005</u>               | <u>.005</u> | <u>Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; run-off from waste batteries and paints.</u> | <u>Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Chromium</u>   | <u>.1</u>                 | <u>.1</u>   | <u>Discharge from steel and pulp mills; Erosion of natural deposits.</u>   | <u>Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Copper</u>   | <u>Action Level = 1.3</u> | <u>1.3</u>  | <u>Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.</u>                               | <u>Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>Cyanide</u>  | <u>.2</u>                 | <u>.2</u>   | <u>Discharge from steel or metal factories; Discharge from plastic and fertilizer factories.</u>   | <u>Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Fluoride</u>   | <u>4.0</u>                | <u>4.0</u>  | <u>Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories.</u>             | <u>Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Fluoride Levels greater than 2.0 mg/L, but less than 4.0 mg/L.</u> | <u>N/A</u>                | <u>N/A</u>  |  | <u>See endnote (d).</u>  |             |             |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

|                 |                                      |             |  |  |             |                           |
|-----------------|--------------------------------------|-------------|--|--|-------------|---------------------------|
| <u>Lead</u>     | <u>Action Level =</u><br><u>.015</u> | <u>0</u>    | <u>Corrosion of household plumbing systems; Erosion of natural deposits.</u>   | <u>Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.</u> | <u>NAL1</u> | <u>NAL2</u>               |
| <u>Mercury</u>  | <u>.002</u>                          | <u>.002</u> | <u>Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from crop land.</u> | <u>Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.</u>  | <u>NAL1</u> | <u>NAL2</u>               |
| <u>Nitrate</u>  | <u>10</u>                            | <u>10</u>   | <u>Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.</u>                        | <u>Infants below the age of 6 months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.</u>   | <u>AC</u>   | <u>AC,</u><br><u>NAL2</u> |
| <u>Nitrite</u>  | <u>1</u>                             | <u>1</u>    | <u>Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.</u>                        | <u>Infants below the age of 6 months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.</u>   | <u>AC</u>   | <u>AC,</u><br><u>NAL2</u> |
| <u>Selenium</u> | <u>.05</u>                           | <u>.05</u>  | <u>Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.</u>                   | <u>Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.</u>   | <u>NAL1</u> | <u>NAL2</u>               |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|                 |             |              |   |   |             |             |
|-----------------|-------------|--------------|---|---|-------------|-------------|
| <u>Thallium</u> | <u>.002</u> | <u>.0005</u> | <u>Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.</u> | <u>Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.</u> | <u>NAL1</u> | <u>NAL2</u> |
|-----------------|-------------|--------------|---|---|-------------|-------------|

**Part 5. Synthetic Organic Contaminants (including Pesticides and Herbicides)**

| <u>Synthetic Organic Contaminants (including Pesticides and Herbicides)</u> | <u>MCL in mg/L</u>                                   | <u>MCLG in mg/L</u> | <u>Major Sources in Drinking Water</u>                        | <u>Mandatory Health Language</u>  | <u>Type of PN* required</u> |                |
|---|--|---------------------|---|---|-----------------------------|----------------|
|   |  |                     |   |   | <u>MCL*</u>                 | <u>Monit.*</u> |
| <u>2,4-D</u>  | <u>.07</u>   | <u>.07</u>          | <u>Runoff from herbicide used on row crops.</u>               | <u>Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.</u>   | <u>NAL1</u>                 | <u>NAL2</u>    |
| <u>2,4,5-TP [Silvex]</u>  | <u>.05</u>   | <u>.05</u>          | <u>Residue of banned herbicide.</u>                           | <u>Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.</u>  | <u>NAL1</u>                 | <u>NAL2</u>    |
| <u>Acrylamide</u>   | <u>Treatment Technique as specified in R18-4-317</u> | <u>0</u>            | <u>Added to water during sewage and wastewater treatment.</u> | <u>Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.</u>                        | <u>NAL1</u>                 | <u>NAL2</u>    |
| <u>Alachlor</u>   | <u>.002</u>  | <u>0</u>            | <u>Runoff from herbicide used on row crops.</u>               | <u>Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.</u> | <u>NAL1</u>                 | <u>NAL2</u>    |
| <u>Atrazine</u>   | <u>.003</u>  | <u>.003</u>         | <u>Runoff from herbicide used on row crops.</u>               | <u>Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.</u>   | <u>NAL1</u>                 | <u>NAL2</u>    |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

|                                    |              |            |  |   |             |             |
|------------------------------------|--------------|------------|--|---|-------------|-------------|
| <u>Benzo(a)pyrene [PAH]</u>        | <u>.0002</u> | <u>0</u>   | <u>Leaching from linings of water storage tanks and distribution lines.</u>                      | <u>Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Carbofuran</u>                  | <u>.04</u>   | <u>.04</u> | <u>Leaching of soil fumigant used on rice and alfalfa.</u>                                       | <u>Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Chlordane</u>                   | <u>.002</u>  | <u>0</u>   | <u>Residue of banned termiticide.</u>  | <u>Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.</u>                                  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Dalapon</u>                     | <u>.2</u>    | <u>.2</u>  | <u>Runoff from herbicide used on rights of way.</u>  | <u>Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Di(2-ethylhexyl) adipate</u>    | <u>.4</u>    | <u>.4</u>  | <u>Discharge from chemical factories.</u>  | <u>Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Di(2-ethylhexyl) phthalate</u>  | <u>.006</u>  | <u>0</u>   | <u>Discharge from rubber and chemical factories.</u>   | <u>Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>Dibromochloropropane (DBCP)</u> | <u>.0002</u> | <u>0</u>   | <u>Runoff or leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.</u> | <u>Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|                              |   |             |   |   |             |             |
|------------------------------|---|-------------|---|---|-------------|-------------|
| <u>Dinoseb</u>               | <u>.007</u>   | <u>.007</u> | <u>Runoff from herbicide used on soybeans and vegetables.</u>                                       | <u>Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Dioxin [2,3,7,8-TCDD]</u> | <u>.00000003</u>                                      | <u>0</u>    | <u>Emissions from waste incineration and other combustion; Discharge from chemical factories.</u>   | <u>Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Diquat</u>                | <u>.02</u>  | <u>.02</u>  | <u>Runoff from herbicide use.</u>   | <u>Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Endothall</u>             | <u>.1</u>   | <u>.1</u>   | <u>Runoff from herbicide use.</u>   | <u>Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Endrin</u>                | <u>.002</u>   | <u>.002</u> | <u>Residue of banned insecticide.</u>   | <u>Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Epichlorohydrin</u>       | <u>Treatment technique as specified in R18-4-317.</u> | <u>0</u>    | <u>Discharge from industrial chemical factories; An impurity of some water treatment chemicals.</u> | <u>Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Ethylene dibromide</u>    | <u>.00005</u>   | <u>0</u>    | <u>Discharge from petroleum refineries.</u>   | <u>Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>Glyphosate</u>            | <u>.7</u>   | <u>.7</u>   | <u>Runoff from herbicide use.</u>   | <u>Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.</u>  | <u>NAL1</u> | <u>NAL2</u> |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

|                                  |              |              |  |  |             |             |
|----------------------------------|--------------|--------------|--|--|-------------|-------------|
| <u>Heptachlor</u>                | <u>.0004</u> | <u>0</u>     | <u>Residue of banned pesticide.</u>  | <u>Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Heptachlor epoxide</u>        | <u>.0002</u> | <u>0</u>     | <u>Breakdown of heptachlor.</u>  | <u>Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Hexachlorobenzene</u>         | <u>.001</u>  | <u>0</u>     | <u>Discharge from metal refineries and agricultural chemical factories.</u>                    | <u>Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>Hexachlorocyclopentadiene</u> | <u>.05</u>   | <u>.05</u>   | <u>Discharge from chemical factories.</u>  | <u>Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Lindane</u>                   | <u>.0002</u> | <u>.0002</u> | <u>Runoff or leaching from insecticide used on cattle, lumber, and gardens.</u>                | <u>Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Methoxychlor</u>              | <u>.04</u>   | <u>.04</u>   | <u>Runoff or leaching from insecticide used on fruits, vegetables, alfalfa, and livestock.</u> | <u>Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Oxamyl [Vydate]</u>           | <u>.2</u>    | <u>.2</u>    | <u>Runoff or leaching from insecticide used on apples, potatoes and tomatoes.</u>              | <u>Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.</u>  | <u>NAL1</u> | <u>NAL2</u> |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|   |              |             |   |  |             |             |
|---|--------------|-------------|---|--|-------------|-------------|
| <u>PCBs [Polychlorinated biphenyls]</u> | <u>.0005</u> | <u>0</u>    | <u>Runoff from landfills; discharge of waste chemicals.</u>           | <u>Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>Pentachlorophenol</u>                | <u>.001</u>  | <u>0</u>    | <u>Discharge from wood preserving factories.</u>                      | <u>Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Picloram</u>                         | <u>.5</u>    | <u>.5</u>   | <u>Herbicide runoff.</u>  | <u>Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Simazine</u>                         | <u>.004</u>  | <u>.004</u> | <u>Herbicide runoff.</u>  | <u>Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>Toxaphene</u>                        | <u>.003</u>  | <u>0</u>    | <u>Runoff or leaching from insecticide used on cotton and cattle.</u> | <u>Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |

**Part 6. Volatile Organic Contaminants**

| <u>Volatile Organic Contaminants</u> | <u>MCL in mg/L</u> | <u>MCLG in mg/L</u> | <u>Major Sources in Drinking Water</u>  | <u>Mandatory Health Language</u>   | <u>Type of PN* required</u> |                |
|--------------------------------------|--------------------|---------------------|---|--|-----------------------------|----------------|
|                                      |                    |                     |   |  | <u>MCL*</u>                 | <u>Monit.*</u> |
| <u>Benzene</u>                       | <u>.005</u>        | <u>0</u>            | <u>Discharge from factories; Leaching from gas storage tanks and landfills.</u> | <u>Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.</u> | <u>NAL1</u>                 | <u>NAL2</u>    |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|                                 |             |             |  |  |             |             |
|---------------------------------|-------------|-------------|--|--|-------------|-------------|
| <u>Carbon tetrachloride</u>     | <u>.005</u> | <u>0</u>    | <u>Discharge from chemical plants and other industrial activities.</u> | <u>Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>Chlorobenzene</u>            | <u>.1</u>   | <u>.1</u>   | <u>Discharge from chemical and agricultural chemical factories.</u>    | <u>Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>o-Dichlorobenzene</u>        | <u>.6</u>   | <u>.6</u>   | <u>Discharge from industrial chemical factories.</u>                   | <u>Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.</u>               | <u>NAL1</u> | <u>NAL2</u> |
| <u>p-Dichlorobenzene</u>        | <u>.075</u> | <u>.075</u> | <u>Discharge from industrial chemical factories.</u>                   | <u>Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>1,2-Dichloroethane</u>       | <u>.005</u> | <u>0</u>    | <u>Discharge from industrial chemical factories.</u>                   | <u>Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>1,1-Dichloroethylene</u>     | <u>.007</u> | <u>.007</u> | <u>Discharge from industrial chemical factories.</u>                   | <u>Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.</u>  | <u>NAL1</u> | <u>NAL2</u> |
| <u>cis-1,2-Dichloroethylene</u> | <u>.07</u>  | <u>.07</u>  | <u>Discharge from industrial chemical factories.</u>                   | <u>Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.</u>  | <u>NAL1</u> | <u>NAL2</u> |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|                                   |             |            |  |  |             |             |
|-----------------------------------|-------------|------------|--|--|-------------|-------------|
| <u>trans-1,2-Dichloroethylene</u> | <u>.1</u>   | <u>.1</u>  | <u>Discharge from industrial chemical factories.</u>                         | <u>Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.</u>                                 | <u>NAL1</u> | <u>NAL2</u> |
| <u>Dichloromethane</u>            | <u>.005</u> | <u>0</u>   | <u>Discharge from pharmaceutical and chemical factories.</u>                 | <u>Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.</u>                 | <u>NAL1</u> | <u>NAL2</u> |
| <u>1,2-Dichloropropane</u>        | <u>.005</u> | <u>0</u>   | <u>Discharge from industrial chemical factories.</u>                         | <u>Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Ethylbenzene</u>               | <u>.7</u>   | <u>.7</u>  | <u>Discharge from petroleum refineries.</u>                                  | <u>Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.</u>                                    | <u>NAL1</u> | <u>NAL2</u> |
| <u>Styrene</u>                    | <u>.1</u>   | <u>.1</u>  | <u>Discharge from rubber and plastic factories; Leaching from landfills.</u> | <u>Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.</u>                          | <u>NAL1</u> | <u>NAL2</u> |
| <u>Tetrachloroethylene</u>        | <u>.005</u> | <u>0</u>   | <u>Discharge from factories and dry cleaners.</u>                            | <u>Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>1,2,4-Trichlorobenzene</u>     | <u>.07</u>  | <u>.07</u> | <u>Discharge from textile-finishing factories.</u>                           | <u>Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.</u>                               | <u>NAL1</u> | <u>NAL2</u> |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|                              |             |             |   |   |             |             |
|------------------------------|-------------|-------------|---|---|-------------|-------------|
| <u>1,1,1-Trichloroethane</u> | <u>.2</u>   | <u>.2</u>   | <u>Discharge from metal degreasing sites and other factories.</u>             | <u>Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.</u>       | <u>NAL1</u> | <u>NAL2</u> |
| <u>1,1,2-Trichloroethane</u> | <u>.005</u> | <u>.003</u> | <u>Discharge from industrial chemical factories.</u>                          | <u>Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.</u>                   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Trichloroethylene</u>     | <u>.005</u> | <u>0</u>    | <u>Discharge from metal degreasing sites and other factories.</u>             | <u>Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.</u> | <u>NAL1</u> | <u>NAL2</u> |
| <u>Toluene</u>               | <u>1</u>    | <u>1</u>    | <u>Discharge from petroleum factories.</u>                                    | <u>Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.</u>                                 | <u>NAL1</u> | <u>NAL2</u> |
| <u>Vinyl Chloride</u>        | <u>.002</u> | <u>0</u>    | <u>Leaching from PVC piping; Discharge from plastics factories.</u>           | <u>Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.</u>   | <u>NAL1</u> | <u>NAL2</u> |
| <u>Xylenes</u>               | <u>10</u>   | <u>10</u>   | <u>Discharge from petroleum factories; Discharge from chemical factories.</u> | <u>Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.</u>   | <u>NAL1</u> | <u>NAL2</u> |

**Key to Acronyms:**

\*PN = Public Notice

\*MCL = Violation of a MCL

\*MRDL = Violation of a MRDL

\*Monit.= Failure to perform monitoring

AC = Acute (24 hour) public notice

NAL1 = Nonacute Level 1 (30 day) public notice

NAL2 = Nonacute Level 2 (12 month) public notice

MCLG = Maximum Contaminant Level Goal

MRDLG = Maximum Residual Disinfectant Level Goal (defined at R18-7-103(C))

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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**Endnotes:**

- a. In addition to the mandatory health language, a system shall include either the language in endnote (a)(i) or (a)(ii). A system with a violation at the water treatment plant, but not in the distribution system, shall use the language in endnote (a)(i) and provide a Nonacute public notice. A system with a violation in the distribution system shall use the language in endnote (a)(ii) and provide an Acute public notice.
  - i. The chlorine dioxide violations reported today are the result of violations at the treatment facility only, and do not include violations within the distribution system serving users of this water supply. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to present consumers.
  - ii. The chlorine dioxide violations reported today include violations of the EPA standard within the distribution system serving water users. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including pregnant women, infants, and young children, may be especially susceptible to adverse effects of excessive exposure to chlorine dioxide-treated water. The purpose of this notice is to advise that such persons should consider reducing their risk of adverse effects from these chlorine dioxide violations by seeking alternate sources of water for human consumption until such violations are rectified. Local and state health authorities are the best sources for information concerning alternate drinking water.
- b. Haloacetic Acids (HAA5): The MCL of .060mg/L is effective May 1, 2002 for surface water systems serving at least 10,000 persons. The CCR for calendar year 2002 shall reflect the MCL of .060mg/L.
- c. Total trihalomethanes (TTHM): The MCL of .080mg/L is effective May 1, 2002 for surface water systems serving at least 10,000 persons. The CCR for calendar year 2001 shall reflect the MCL of .10mg/L, and the CCR for calendar year 2002 shall reflect the MCL of .080mg/L.
- d. Mandatory health effects language for fluoride levels greater than 2 mg/L:

This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/L) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/L.

Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

Drinking water containing more than 4 mg/L of fluoride (the U.S. Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/L of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/L because of this cosmetic dental problem.

For more information, please call [name of water system contact] of [name of community water system] at [phone number]. Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP.

**ARTICLE 2. MAXIMUM CONTAMINANT LEVELS AND MONITORING REQUIREMENTS; MONITORING ASSISTANCE PROGRAM**

**R18-4-210. Fluoride; Special Public Notice (Repeal May 6, 2002)**

- A. No change
  1. No change
  2. No change
- B. No change
- C. This Section is repealed May 6, 2002.

**R18-4-214. Total Trihalomethanes: MCL And Monitoring Requirements (Repeal January 1, 2004)**

- A. This Section does not apply to surface water systems serving 10,000 or more persons. After May 1, 2002, the maximum contaminant level for total trihalomethanes applies only to water that is distributed by a ~~community water system~~ CWS which ~~that~~ serves a population of 10,000 or more persons and which ~~that~~ adds a halogenated disinfectant to the water at any a point in the treatment process ~~[hereafter referred to as a CWS in this Section].~~
- B. The maximum contaminant level for total trihalomethanes is 0.10 mg/L.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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- C. A CWS shall take ~~4~~ four samples per quarter for each water treatment plant operated by the CWS. For purposes of this Section, the minimum number of samples required to be ~~taken~~ collected shall be based upon the number of water treatment plants used by the CWS, except that multiple wells drawing water from a single aquifer may, with Department approval, be considered ~~4~~ one water treatment plant for determining the minimum number of samples required. All samples ~~taken~~ collected within a quarter shall be collected within a 24-hour period.
- D. At least 25% of the total trihalomethane samples shall be ~~taken~~ collected at locations within the distribution system ~~which~~ that reflect the maximum residence time of water in the system. The remaining 75% of the samples shall be ~~taken~~ collected at representative locations in the distribution system.
- E. Reduced monitoring. ~~Upon the written request of a CWS, the Department may reduce the number of samples taken per quarter to a minimum of 1 one sample for each water treatment plant. The Department's decision to reduce the number of samples shall be in writing. The Department may reduce the number of quarterly samples, provided that:~~
- ~~1. The sample is taken at a point in the distribution system which reflects the maximum residence time of the water in the system; and~~
  - ~~2. There is at least 1 one year of monitoring data which demonstrates that total trihalomethane concentrations are below 0.10 mg/L.~~
  - ~~3. If the concentration of total trihalomethanes in any sample exceeds 0.10 mg/L and the analytical results are confirmed by at least 1 one confirmation sample taken within 24 hours after such analytical results are received or, if the CWS changes its source or treatment process, the CWS shall immediately resume monitoring in accordance with the monitoring frequency prescribed in subsection (C) and continue such monitoring for at least 1 one year.~~
1. Upon the written request of a CWS, the Department may reduce the number of samples collected per quarter to a minimum of one sample for each water treatment plant. The Department's decision to reduce the number of samples shall be in writing. The Department may reduce the number of quarterly samples if:
- a. The sample is collected at a point in the distribution system that reflects the maximum residence time of the water in the system; and
  - b. There is at least one year of monitoring data which demonstrates that total trihalomethane concentrations are below 0.10 mg/L.
2. If the concentration of total trihalomethanes in a sample exceeds 0.10 mg/L and the analytical results are confirmed by at least one confirmation sample collected within 24 hours after such analytical results are received or, if the CWS changes its source or treatment process, the CWS shall immediately resume monitoring in accordance with the monitoring frequency prescribed in subsection (C) and continue that monitoring for at least one year.
- F. A CWS that is a groundwater system may make a written request that the Department reduce monitoring frequency to a minimum of ~~4~~ one sample for maximum total trihalomethane potential [MTP] per year for each water treatment plant used by the system. The Department may reduce monitoring frequency by a groundwater system provided the groundwater system submits data that demonstrates that the MTP is less than 0.10 mg/L and the groundwater system is not likely to exceed the maximum contaminant level for total trihalomethanes. The Department's decision to reduce monitoring frequency to ~~4~~ one sample for MTP per water treatment plant shall be in writing. ~~The required MTP sample shall be taken at a point reflects the maximum residence time of the water in the distribution system. If the analytical results of a sample taken by a groundwater system for MTP are equal to or greater than 0.10 mg/L and results are confirmed by at least 1 one sample taken within 24 hours after analytical results are received, then the groundwater system shall immediately resume monitoring at the frequency prescribed in subsection (C) and continue such monitoring for at least 1 one year. If the groundwater system changes its source of water or treatment process, the groundwater system shall immediately analyze an additional sample for MTP. The additional sample shall be taken at a point reflects the maximum residence time of the water in the distribution system.~~
1. The required MTP sample shall be collected at a point that reflects the maximum residence time of the water in the distribution system.
  2. If the analytical results of a sample collected by a groundwater system for MTP are equal to or greater than 0.10 mg/L and the results are confirmed by at least one sample collected within 24 hours after analytical results are received, then the groundwater system shall immediately resume monitoring at the frequency prescribed in subsection (C) and continue that monitoring for at least one year.
  3. If the groundwater system changes its source of water or treatment process, the groundwater system shall immediately analyze an additional sample for MTP. The additional sample shall be collected at a point that reflects the maximum residence time of the water in the distribution system.
- G. The Department may increase monitoring frequency where necessary to detect variations of levels of total trihalomethanes within a distribution system.
- H. The results of all analyses ~~taken~~ collected each quarter shall be arithmetically averaged and reported to the Department within 30 days of a water system's receipt of the last results of the previous quarter. Unless the analytical results are invalidated by the Department because the samples were not collected and analyzed in conformance with this Section, all samples collected shall be used in the computation of the average.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

- I. Compliance with the maximum contaminant level for total trihalomethanes shall be determined based on a running annual average of quarterly samples collected by a CWS.
- J. This Section is repealed January 1, 2004.

**R18-4-214.01. Disinfectant Residuals and Disinfection Byproducts (Effective May 1, 2002; Repeal January 1, 2004)**

- A. This Section applies to surface water systems serving 10,000 or more persons. After May 1, 2002 a CWS or NTNCWS shall comply with the following MCLs for disinfection byproducts:

| <u>Disinfection byproduct</u>  | <u>MCL (mg/L)</u> |
|--------------------------------|-------------------|
| Total trihalomethanes (TTHM)   | 0.080             |
| Haloacetic acids (five) (HAA5) | 0.060             |
| Bromate                        | 0.010             |
| Chlorite                       | 1.0               |

- B. A CWS or NTNCWS that is installing GAC or membrane technology to comply with the MCLs listed in subsection (A), may make a written request to the Department for an extension of up to 24 months past the compliance date, but not beyond December 31, 2003. The Department shall develop, and a system shall comply with, an extension agreement. An extension agreement shall provide the following:
  1. A schedule for compliance with specific project milestones.
  2. A schedule for submission of progress reports.
  3. A requirement for notice of monitoring results and extension in the system's CCR.
  4. A public notification requirement if a MCL in subsection (A) is exceeded, and
  5. Interim treatment requirements.
    - a. In order to determine the appropriate interim treatment requirements for an extension agreement, the Department may consider, but is not limited to, the following information: monitoring data for disinfection byproducts, current treatment practices, current water treatment plant infrastructure, construction plans, and pilot studies.
    - b. Interim treatment requirements may include: moving the point of disinfection, treatment changes to improve TOC removal, changing primary or secondary disinfectants, adjusting pH to reduce disinfection byproduct formation, and implementing a main flushing program in areas with high detention times or biofilm problems.
- C. A CWS or NTNCWS shall comply with the following MRDLs for disinfectant residuals:

| <u>Disinfectant Residual</u> | <u>MRDL (mg/L)</u>         |
|------------------------------|----------------------------|
| Chlorine                     | 4.0 (as Cl <sub>2</sub> )  |
| Chloramines                  | 4.0 (as Cl <sub>2</sub> )  |
| Chlorine dioxide             | 0.8 (as ClO <sub>2</sub> ) |

- D. A TNCWS that uses chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL in subsection (C).
- E. In order to protect public health, a system may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.
- F. A system shall collect disinfection byproduct and residual disinfection level samples at sites that are representative of water throughout the distribution system according to a written monitoring plan. The system shall submit the monitoring plan to the Department for review. After review, the Department may require changes to the monitoring plan. The system shall maintain the plan and make it available for inspection by the Department and the general public no later than January 31, 2002. The system shall submit a copy of the monitoring plan to the Department no later than the date of the first report required in R18-4-104(A). The plan shall include at least the following elements:
  1. Specific locations and schedules for collecting samples required by this Section;
  2. Compliance calculation methods for applicable MCLs, MRDLs, and treatment techniques; and
  3. If approved for monitoring as a consecutive system or if providing water to a consecutive system as prescribed under R18-4-113, the monitoring plan shall reflect the entire distribution system.
- G. General monitoring requirements for disinfectant residuals and disinfection byproducts.
  1. A system shall collect all samples during normal operating conditions.
  2. A system shall monitor in accordance with the monitoring plan required in subsection (F).
  3. A system may use only data collected under the provisions of this Section to qualify for reduced monitoring.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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**H. Monitoring requirements for disinfection byproducts.**

1. TTHM and HAA5. A CWS or NTNCWS shall monitor for TTHM and HAA5 at the following frequencies:
  - a. Routine monitoring: A system shall collect at least four samples per quarter per water treatment plant in the distribution system. A system shall collect at least 25 percent of the samples collected in a quarter at locations representing maximum residence time. A system shall collect the remaining samples at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods. If a system elects to collect more than the minimum samples required, the system shall collect at least 25 percent of all samples collected each quarter at locations that represent the maximum residence time of the water in the distribution system. A system shall collect the remaining samples at locations representative of at least average residence time in the distribution system.
  - b. Reduced monitoring: A system may submit a written request to the Department for a reduction in TTHM and HAA5 monitoring. The Department's decision to reduce monitoring for TTHM and HAA5 shall be in writing.
    - i. The Department may reduce TTHM and HAA5 monitoring to one sample per water treatment plant per quarter if a system's source water annual average TOC level, before any treatment, is less than or equal to 4.0 mg/L, TTHM annual average is less than or equal to 0.040 mg/L, and HAA5 annual average is less than or equal to 0.030mg/L. A system on a reduced monitoring schedule shall collect samples at a distribution system location reflecting maximum residence time.
    - ii. If the average of all samples collected in a year for a system on a reduced monitoring schedule is greater than 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, the system shall resume monitoring at the frequency identified in subsection (H)(1)(a) in the quarter immediately following the monitoring period in which the average exceeds 0.060 mg/L for TTHM or 0.045 mg/L for HAA5.
2. Chlorite: A CWS or NTNCWS using chlorine dioxide for disinfection or oxidation shall monitor for chlorite at the following frequencies:
  - a. Routine monitoring: A system shall collect a daily sample at the point-of-entry into the distribution system. If a daily sample exceeds the chlorite MCL, the system shall collect additional samples in the distribution system the following day at the locations required in subsection (H)(2)(c), in addition to the sample required at the point-of-entry into the distribution system.
  - b. Monthly monitoring: A system shall collect three samples each month in the distribution system. The system shall collect one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. If a system collects additional routine samples, it shall collect them in the same manner as for monthly monitoring. The system may use the results of additional monitoring conducted under subsection (H)(2)(c) to meet the requirement for monthly monitoring.
  - c. Additional monitoring: On each day following a routine sample monitoring result that exceeds the chlorite MCL at the point-of-entry into the distribution system, the system shall collect three chlorite samples in the distribution system at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).
  - d. Reduced monitoring:
    - i. The Department shall not reduce chlorite monitoring at the point-of-entry into the distribution system.
    - ii. A system may submit a written request to the Department for a reduction in chlorite monitoring in the distribution system required in subsection (H)(2)(b). The Department may reduce chlorite monitoring in the distribution system to one set of three samples per quarter after the system has monitored for one year and no individual chlorite sample collected in the distribution system under subsection (H)(2)(b) has exceeded the chlorite MCL and the system has not been required to conduct monitoring under subsection (H)(2)(c). The Department's decision to reduce monitoring for chlorite in the distribution system shall be in writing.
    - iii. A system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples collected monthly in the distribution system under subsection (H)(2)(b) exceeds the chlorite MCL or the system is required to conduct monitoring under subsection (H)(2)(c), at which time the system shall revert to routine monitoring.
3. Bromate. A CWS or NTNCWS using ozone for disinfection or oxidation shall monitor for bromate at the following frequencies:
  - a. Routine monitoring: A system shall collect one sample per month for each water treatment plant in the system using ozone. A system shall collect a sample each month at the point-of-entry into the distribution system while the ozonation system is operating under normal conditions.
  - b. Reduced monitoring: A system may submit a written request to the Department for a reduction in bromate monitoring. The Department may reduce bromate monitoring in the distribution system to once per quarter, if the system demonstrates that the annual average for source water bromide concentration is less than 0.05 mg/L based

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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upon representative monthly bromide measurements. A system shall continue monthly bromide monitoring to remain on reduced bromate monitoring. The Department's decision to reduce monitoring for bromate shall be in writing.

- c. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is greater than or equal to 0.05 mg/L, the system shall resume routine monitoring required in subsection (H)(3)(a).

**I.** Compliance for disinfection byproducts. The Department shall determine compliance with a disinfection byproduct as follows:

1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
2. During the first year of monitoring under this Section, if the average for an individual quarter will cause the running annual average of a system to exceed a MCL, the system is out of compliance at the end of that quarter.
3. TTHM and HAA5: For a system that monitors quarterly, the Department shall determine compliance with a MCL for TTHM and HAA5 based on the running annual average of all samples collected by the system as required in of subsection (H)(1). For a system that fails to collect four consecutive quarters of samples, the Department shall determine compliance with the MCL for TTHM and HAA5 based on an average of the available data.
4. Bromate: For a system required to monitor for bromate, the Department shall determine compliance with the MCL for bromate based on the running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system collects more than one sample, the average of all samples collected during the month) collected by the system as required in subsection (H)(3). For a system that fails to collect 12 consecutive months of samples for bromate, the Department shall determine compliance with the MCL for bromate based on an average of the available data.
5. Chlorite: For a system required to monitor for chlorite, the Department shall determine compliance with the MCL for chlorite based on a monthly arithmetic average of samples collected by the system as required in subsection (H)(2).

**J.** Monitoring requirements for disinfectant residuals.

1. Chlorine and chloramines. A CWS or NTNCWS that uses chlorine or chloramines shall measure the residual disinfectant level in the distribution system when total coliforms are sampled as required in R18-4-303(C)(3). The Department shall not reduce monitoring for chlorine or chloramines.
2. Chlorine dioxide. A CWS, NTNCWS, or TNCWS that uses chlorine dioxide for disinfection or oxidation shall monitor for chlorine dioxide at the following frequencies:
  - a. Routine monitoring: A system shall collect a daily sample at the point-of-entry into the distribution system. For a daily sample that exceeds the MRDL, the system shall collect samples in the distribution system the following day at the locations required by subsection (J)(2)(b), in addition to the sample required at the point-of-entry into the distribution system.
  - b. Additional monitoring: On each day following a routine sample monitoring result that exceeds the MRDL, the system shall collect three chlorine dioxide distribution system samples.
    - i. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the point-of-entry into the distribution system (that is no booster chlorination), the system shall collect three chlorine dioxide samples as close to the first customer as possible, at intervals of at least six hours.
    - ii. If chlorine or chloramines are used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the point-of-entry into the distribution system (that is booster chlorination), the system shall collect one chlorine dioxide sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible, reflecting maximum residence time in the distribution system.
    - iii. The Department shall not reduce monitoring for chlorine dioxide.

**K.** Compliance for disinfectant residuals. The Department shall determine compliance with disinfectant residuals in subsection (C) as follows:

1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
2. Chlorine and chloramines.
  - a. A system that fails to monitor for a disinfectant residual where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, is out of compliance for the entire period covered by the annual average.

**Arizona Administrative Register**  
**Notices of Final Rulemaking**

- b. The Department shall determine compliance with a MRDL for chlorine and chloramines based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under subsection (J)(1).
- c. For a system that switches between the use of chlorine and chloramines for residual disinfection during the year, the Department shall include all monitoring results of both chlorine and chloramines in calculating compliance.
- 3. Chlorine dioxide. The Department shall determine compliance with the MRDL for chlorine dioxide based on consecutive daily samples collected by the system under subsection (J)(2).
  - a. a sample collected in the distribution system that exceeds the MRDL the day after a sample collected at the point-of-entry into the distribution system exceeds the MRDL is an acute violation. The system shall immediately take corrective action to lower the level of chlorine dioxide below the MRDL. Failure to collect a sample in the distribution system on the day following a sample collected at the point-of-entry into the distribution system that exceeds the chlorine dioxide MRDL, is an acute violation.
  - b. If all the samples the system collects in the distribution system are less than the MRDL after any two consecutive daily samples collected at the point-of-entry into the distribution system exceed the MRDL, it is a non-acute violation. The system shall take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling. Failure to collect a sample at the point-of-entry into the distribution system the day after a sample at the point-of-entry into the distribution system exceeds the chlorine dioxide MRDL is a non-acute violation.

**L. Monitoring requirements for disinfection byproduct precursors (TOC).**

- 1. Routine monitoring: A CWS or NTNCWS that uses conventional filtration treatment shall monitor each water treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring that is representative of the treated water. A system that is required to monitor under this subsection shall also monitor for TOC and alkalinity in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These TOC and alkalinity samples are referred to as a sample set. A system shall collect one sample set per month per water treatment plant at a time representative of normal operating conditions and source water quality.
- 2. Reduced monitoring: Upon a written request from a system, the Department may approve a reduction in monitoring to one sample set per water treatment plant per quarter for a system with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year. The system shall resume routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L. The Department's decision to reduce monitoring for TOC shall be in writing.

**M. This Section is effective May 1, 2002, and is repealed January 1, 2004.**

**R18-4-214.02. Disinfectant Residuals and Disinfection Byproducts (Effective January 1, 2004)**

- A. This Section applies to surface water systems and ground water systems of any size that use a chemical disinfectant. After January 1, 2004 a CWS or NTNCWS shall comply with the following MCLs for disinfection byproducts:**

| <b><u>Disinfection byproduct</u></b>  | <b><u>MCL (mg/L)</u></b> |
|---------------------------------------|--------------------------|
| <u>Total trihalomethanes (TTHM)</u>   | <u>0.080</u>             |
| <u>Haloacetic acids (five) (HAA5)</u> | <u>0.060</u>             |
| <u>Bromate</u>                        | <u>0.010</u>             |
| <u>Chlorite</u>                       | <u>1.0</u>               |

- B. A CWS or NTNCWS shall comply with the following MRDLs for disinfectant residuals:**

| <b><u>Disinfectant Residual</u></b> | <b><u>MRDL (mg/L)</u></b>       |
|-------------------------------------|---------------------------------|
| <u>Chlorine</u>                     | <u>4.0 (as Cl<sub>2</sub>)</u>  |
| <u>Chloramines</u>                  | <u>4.0 (as Cl<sub>2</sub>)</u>  |
| <u>Chlorine dioxide</u>             | <u>0.8 (as ClO<sub>2</sub>)</u> |

- C. A TNCWS that uses chlorine dioxide as a disinfectant or oxidant shall comply with the MRDL for chlorine dioxide in subsection (B).**
- D. In order to protect public health, a system may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.**
- E. A system shall collect disinfection byproduct and residual disinfection level samples at sites that are representative of water throughout the distribution system according to a written monitoring plan. A surface water system that serves more than 3,300 people shall submit a copy of the monitoring plan to the Department for review no later than the date of the first report required under R18-4-104(A). After review, the Department may require changes to the monitoring plan. The**

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

system shall maintain the plan and make it available for inspection by the Department and the general public no later than January 31, 2004. The Department may require any other PWS to submit a copy of the monitoring plan. A monitoring plan is subject to review and approval by the Department. A monitoring plan shall include at least the following elements:

1. Specific locations and schedules for collecting samples required by this Section;
2. Compliance calculation methods for applicable MCLs, MRDLs, and treatment techniques;
3. If approved for monitoring as a consecutive system or if providing water to a consecutive system as prescribed under R18-4-113, the monitoring plan shall reflect the entire distribution system.

**F. General monitoring requirements for disinfectant residuals and disinfection byproducts.**

1. A system shall take a sample during normal operating conditions.
2. A system may make a written request that the Department consider multiple wells drawing water from a single aquifer as one water treatment plant for determining the minimum number of TTHM and HAA5 samples required. In order to determine the appropriate reduction in monitoring for TTHM and HAA5, the Department may consider, but is not limited to, the following information:
  - a. Well construction and geology.
  - b. Water characteristics and chemistry.
  - c. Number of water treatment plants.
  - d. Hydrologic reports that delineate the source aquifer or aquifers.
  - e. Previous TTHM analytical results.
  - f. Number of persons served, and
  - g. Land area encompassed by the water system.
3. A system shall monitor in accordance with the monitoring plan required under subsection (E).
4. A system may use only data collected under the provisions of this Section to qualify for reduced monitoring.

**G. Monitoring requirements for disinfection byproducts.**

1. Routine monitoring for TTHM and HAA5. A CWS or NTNCWS shall monitor at the frequency indicated in Table 1:

**Table 1. Routine Monitoring for TTHM and HAA5**

| <b><u>Type of system</u></b>  | <b><u>Minimum Monitoring Frequency</u></b>   | <b><u>Sample Location in the distribution system</u></b>   |
|---|--|--|
| <u>A. CWS or NTNCWS using surface water and serving at least 10,000 persons</u>   | <u>four water samples per quarter per water treatment plant</u>                                      | <u>At least 25 percent of all samples collected each quarter at locations representing maximum residence time. Remaining samples collected at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods.</u> |
| <u>B. CWS or NTNCWS using surface water and serving from 500 to 9,999 persons</u> | <u>one water sample per quarter per water treatment plant</u>  | <u>Locations representing maximum residence time.</u>  |
| <u>C. CWS or NTNCWS using surface water and serving fewer than 500 persons</u>    | <u>one water sample per year per water treatment plant during month of warmest water temperature</u> | <u>Locations representing maximum residence time. If the sample (or average of annual samples, if more than one sample is collected) exceeds the MCL, the system shall increase monitoring to one sample per water treatment plant per quarter, collected at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in subsection (G)(2)(c).</u>  |

**Arizona Administrative Register**  
**Notices of Final Rulemaking**

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| D. CWS or NTNCWS using solely groundwater and using chemical disinfectant and serving at least 10,000 persons   | one water sample per quarter per water treatment plant  | Locations representing maximum residence time.   |
| E. CWS or NTNCWS using solely groundwater and using chemical disinfectant and serving fewer than 10,000 persons | one water sample per year per water treatment plant during month of warmest water temperature | Locations representing maximum residence time. If the sample (or average of annual samples, if more than one sample is collected) exceeds the MCL, the system shall increase monitoring to one sample per water treatment plant per quarter, collected at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in subsection (G)(2)(c). |

- a. A system that elects to sample more frequently than the minimum required, shall collect at least 25 percent of all samples collected each quarter at locations that represent the maximum residence time of the water in the distribution system. The system shall collect the remaining samples at locations representative of at least average residence time in the distribution system.
  - b. Multiple wells drawing water from a single aquifer may be considered one water treatment plant for determining the minimum number of samples required, with Department approval in accordance with criteria listed under subsections (F)(2)(a) through (g).
2. Reduced monitoring for TTHM and HAA5. Upon the written request from a system, the Department may approve a reduction in TTHM and HAA5 monitoring in accordance with Table 2:

**Table 2. Reduced Monitoring For TTHM and HAA5**

| <b><u>Type of System</u></b>   | <b><u>Routine Monitoring Results for at Least One Year</u></b>   | <b><u>Reduced Monitoring and Sample Location</u></b>   |
|--|--|--|
| A. CWS or NTNCWS using surface water and serving 10,000 persons or more with a source water annual average TOC level, before any treatment of 4.0 mg/L or less | TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L | one sample per water treatment plant per quarter at distribution system location reflecting maximum residence time   |
| B. CWS or NTNCWS using surface water and serving 500 to 9,999 persons with a source water annual average TOC level, before any treatment of 4.0 mg/L or less   | TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L | one sample per water treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. NOTE: a system serving surface water and serving fewer than 500 persons may not reduce its monitoring to less than one sample per water treatment plant per year. |
| C. CWS or NTNCWS using solely groundwater and using a chemical disinfectant and serving 10,000 persons or more   | TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L | one sample per water treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature  |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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| <p><u>D. CWS or NTNCWS using only groundwater and using chemical a disinfectant and serving fewer than 10,000 persons</u></p> | <p><u>TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L for two consecutive years.</u><br/> OR<br/> <u>TTHM annual average is less than or equal to 0.020 mg/L and HAA5 annual average is less than or equal to 0.015mg/L for one year</u></p> | <p><u>one sample per water treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring.</u></p> |
|---|---|--|

- a. A system on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples collected in the year (for a system that monitors quarterly) or the result of the sample (for a system that monitors no more frequently than annually) is no more than 0.060 mg/L for TTHM and 0.045 mg/L for HAA5. A system that exceeds these levels shall resume monitoring at the frequency identified in subsection (G)(1) (minimum monitoring frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/L for TTHM or 0.045 mg/L for HAA5.
  - b. For a system using solely groundwater and serving fewer than 10,000 persons, if either the TTHM annual average is greater than 0.080 mg/L or the HAA5 annual average is greater than 0.060 mg/L, the system shall increase monitoring as specified in subsection (G)(1) (sample location column) in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/L for TTHM or 0.060 mg/L for HAA5.
  - c. A system on increased monitoring may return to routine monitoring if, after at least one year of monitoring the TTHM annual average is less than or equal to 0.060 mg/L and their HAA5 annual average is less than or equal to 0.045 mg/L.
3. Chlorite: A CWS or NTNCWS using chlorine dioxide for disinfection or oxidation shall monitor for chlorite at the following frequencies:
- a. Routine monitoring: A system shall collect a daily sample at the point-of-entry into the distribution system. If a daily sample exceeds the chlorite MCL, the system shall collect additional samples in the distribution system the following day at the locations required in subsection (G)(3)(c), in addition to the sample required at the point-of-entry into the distribution system.
  - b. Monthly monitoring: A system shall collect three samples each month in the distribution system. The system shall collect one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. If a system collects additional routine samples, it shall collect them in the same manner as for monthly monitoring. The system may use the results of additional monitoring conducted under subsection (G)(3)(c) to meet the requirement for monthly monitoring in this subsection.
  - c. Additional monitoring: On each day following a routine sample monitoring result that exceeds the chlorite MCL at the point-of-entry into the distribution system, the system shall collect three chlorite samples in the distribution system at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).
  - d. Reduced monitoring:
    - i. The Department shall not reduce chlorite monitoring at the point-of-entry into the distribution system.
    - ii. A system may submit a written request to the Department for a reduction in chlorite monitoring in the distribution system required in subsection (G)(3)(b). The Department may reduce chlorite monitoring in the distribution system to one set of three samples per quarter after the system has monitored for one year and no individual chlorite sample collected in the distribution system under subsection (G)(3)(b) has exceeded the chlorite MCL and the system has not been required to conduct monitoring under subsection (G)(3)(c). The Department's decision to reduce monitoring for chlorite in the distribution system shall be in writing.
    - iii. A system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples collected monthly in the distribution system under subsection (G)(3)(b) exceeds the chlorite MCL or the system is required to conduct monitoring under subsection (G)(3)(c) of this Section, at which time the system shall resume routine monitoring.
4. Bromate. A CWS or NTNCWS using ozone for disinfection or oxidation shall monitor for bromate at the following frequencies:
- a. Routine monitoring: A system shall collect one sample per month for each water treatment plant in the system using ozone. A system shall collect a sample each month at the point-of-entry into the distribution system while the ozonation system is operating under normal conditions.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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- b. Reduced monitoring: A system may submit a written request to the Department for a reduction in bromate monitoring. The Department may reduce bromate monitoring in the distribution system to once per quarter, if the system demonstrates that the annual average for source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements. A system shall continue monthly bromide monitoring to remain on reduced bromate monitoring. The Department's decision to reduce monitoring for bromate shall be in writing.
- c. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is greater than or equal to 0.05 mg/L, the system shall resume routine monitoring required in subsection (G)(4)(a).

**H.** Compliance for disinfection byproducts. The Department shall determine compliance with a disinfection byproduct as follows:

- 1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
- 2. During the first year of monitoring under this Section, if the average for an individual quarter will cause the running annual average of a system to exceed a MCL, the system is out of compliance at the end of that quarter.
- 3. TTHM and HAA5:
  - i. For a system that monitors quarterly, the Department shall determine compliance with a MCL for TTHM and HAA5 based on a running annual average of all samples collected by the system as required in of subsections (G)(1) and (2). For a system that fails to collect four consecutive quarters of samples, the Department shall determine compliance with the MCL for TTHM and HAA5 based on an average of the available data.
  - ii. For a system that monitors less frequently than quarterly, the Department shall determine compliance with a MCL for TTHM and HAA5 based on the average of samples collected that year by the system as required in subsections (G)(1) and (2). If the average of these samples exceeds the MCL, the system shall increase monitoring to once per quarter per water treatment plant. The system is not in violation of the MCL until it has completed one year of quarterly monitoring and the running annual average is greater than the MCL, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. For a system required to increase monitoring frequency to quarterly compliance shall be calculated by including the sample that triggered the increased monitoring and the results of the following three quarters of monitoring.
- 4. Bromate: For a system required to monitor for bromate, the Department shall determine compliance with the MCL for bromate based on the running annual arithmetic average, computed quarterly, of monthly samples collected by the system as required in subsection (G)(4) or, for months in which the system collects more than one sample, the average of all samples collected during the month. For a system that fails to collect 12 consecutive months of samples for bromate, the Department shall determine compliance with the MCL for bromate based on an average of the available data.
- 5. Chlorite: For a system required to monitor for chlorite, the Department shall determine compliance with the MCL for chlorite based on a monthly arithmetic average of samples collected by the system as required in subsection (G)(3).

**I.** Monitoring requirements for disinfectant residuals.

- 1. Chlorine and chloramines. A CWS or NTNCWS that uses chlorine or chloramines shall measure the residual disinfectant level in the distribution system when total coliforms are sampled. A surface water system may use the results of residual disinfectant concentration sampling conducted under R18-4-303(C)(3) instead of taking separate samples. The Department shall not reduce monitoring for chlorine or chloramines.
- 2. Chlorine dioxide. A CWS, NTNCWS, or TNCWS that uses chlorine dioxide for disinfection or oxidation shall monitor for chlorine dioxide at the following frequencies:
  - a. Routine monitoring: A system shall collect a daily sample at the point-of-entry into the distribution system. For a daily sample that exceeds the MRDL, the system shall collect samples in the distribution system the following day at the locations required by subsection (I)(2)(b), in addition to the sample required at the point-of-entry into the distribution system.
  - b. Additional monitoring: On each day following a routine sample monitoring result that exceeds the MRDL, the system shall collect three chlorine dioxide distribution system samples.
    - i. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the point-of-entry into the distribution system (that is no booster chlorination), the system shall collect three chlorine dioxide samples as close to the first customer as possible, at intervals of at least six hours.
    - ii. If chlorine or chloramines are used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the point-of-entry into the distribution system (that is booster

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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chlorination), the system shall collect one chlorine dioxide sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and at a point as close to the end of the distribution system as possible that reflects the maximum residence time in the distribution system.

iii. The Department shall not reduce monitoring for chlorine dioxide.

**J.** Compliance for disinfectant residuals. The Department shall determine compliance with disinfectant residuals in subsection (B) as follows:

1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
2. Chlorine and chloramines.
  - a. For a system that fails to monitor for a residual level where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, the system is out of compliance for the entire period covered by the annual average.
  - b. The Department shall determine compliance with a MRDL for chlorine and chloramines based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under subsection (I)(1).
  - c. For a system that switches between the use of chlorine and chloramines for residual disinfection during the year, the Department shall determine compliance by including all monitoring results of both chlorine and chloramines in calculating compliance.
3. Chlorine dioxide. The Department shall determine compliance with the MRDL for chlorine dioxide based on consecutive daily samples collected by the system under subsection (I)(2).
  - a. a sample collected in the distribution system which exceeds the MRDL the day after a sample collected at the point-of-entry into the distribution system exceeds the MRDL is an acute violation. The system shall immediately take corrective action to lower the level of chlorine dioxide below the MRDL. Failure to collect samples in the distribution system on the day following a sample collected at the point-of-entry into the distribution system exceeding the chlorine dioxide MRDL, is an acute violation.
  - b. Any two consecutive daily samples collected at the point-of-entry into the distribution system that exceed the MRDL and all the samples the system collected in the distribution are below the MRDL is a non-acute violation. The system shall take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling. Failure to collect a sample at the point-of-entry into the distribution system the day after a sample at the point-of-entry into the distribution system exceeds the chlorine dioxide MRDL is a non-acute violation.

**K.** Monitoring requirements for disinfection byproduct precursors (TOC).

1. Routine monitoring: A CWS or NTNCWS that uses conventional filtration treatment shall monitor each water treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring that is representative of the treated water. A system that is required to monitor under this subsection shall also monitor for TOC and alkalinity in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These TOC and alkalinity samples are referred to as a sample set. A system shall collect one sample set per month per water treatment plant at a time representative of normal operating conditions and source water quality.
2. Reduced monitoring: Upon a written request from a system, the Department may approve a reduction in monitoring to one sample set per water treatment plant per quarter for a system with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year. The system shall resume routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L. The Department's decision to reduce monitoring for TOC shall be in writing.

**L.** This Section is effective January 1, 2004.

**R18-4-220. Best Available Technology**

- A.** No change
  1. No change
  2. No change
- B.** No change
  1. No change
  2. No change
  3. No change
  4. No change
- C.** No change
- D.** The best available technologies, treatment techniques or other means for achieving compliance with the maximum contaminant levels ~~for total trihalomethanes are as follows:~~ for disinfection byproducts are:
  1. ~~Use of chloramines as an alternate or supplemental disinfectant or oxidant;~~
  2. ~~Use of chlorine dioxide as an alternate or supplemental disinfectant or oxidant;~~

**Arizona Administrative Register**  
**Notices of Final Rulemaking**

3. ~~Improved existing clarification for trihalomethane precursor reduction;~~
4. ~~Moving the point of chlorination to reduce total trihalomethane formation and, where necessary, substituting chloramines, chlorine dioxide, or potassium permanganate for the use of chlorine as a pre-oxidant.~~
5. ~~Use of powdered activated carbon for trihalomethane precursor or total trihalomethane reduction seasonally or intermittently at dosages not to exceed 10 mg/L on an annual average basis.~~
1. Total trihalomethanes under the requirements of R18-4-214:
  - a. Use of chloramines as an alternate or supplemental disinfectant or oxidant;
  - b. Use of chlorine dioxide as an alternate or supplemental disinfectant or oxidant;
  - c. Improved existing clarification for trihalomethane precursor reduction;
  - d. Moving the point of chlorination to reduce total trihalomethane formation and, where necessary, substituting chloramines, chlorine dioxide, or potassium permanganate for the use of chlorine as a pre-oxidant.
  - e. Use of powdered activated carbon for trihalomethane precursor or total trihalomethane reduction seasonally or intermittently at dosages not to exceed 10 mg/L on an annual average basis.
2. Disinfection byproducts under the requirements of R18-4-214.01 and R18-4-214.02:

| <u>Disinfection Byproduct</u> | <u>Best Available Technology</u>  |
|-------------------------------|---|
| <u>TTHM</u>                   | <u>Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant</u>                                |
| <u>HAA5</u>                   | <u>Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant</u>                                |
| <u>Bromate</u>                | <u>Control of ozone treatment process to reduce production of bromate</u>   |
| <u>Chlorite</u>               | <u>Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels</u> |

**E.** The best available technologies for achieving compliance with the maximum residual disinfectant levels for disinfectants are the control of treatment processes to reduce disinfectant demand and the control of disinfection treatment processes to reduce disinfectant levels.

**~~E.F.~~** ~~A public water system may defer installation and use of best available technology by obtaining an exemption pursuant to under R18-4-111. The Department may require a public water system to use bottled water, point-of-use treatment devices, point-of-entry treatment devices, or other means as a condition of granting an exemption to avoid an unreasonable risk to public health.~~

**~~E.G.~~** ~~A public water system shall install and use best available technology as a condition for granting a variance under R18-4-110. The Department may require a public water system to use bottled water, point-of-use treatment devices, point-of-entry treatment devices, or other means as a condition of granting a variance to avoid an unreasonable risk to public health. If a water supplier can demonstrate through a comprehensive engineering assessment of a public water system that installation of best available technology will achieve only a de minimis an insignificant reduction in contaminant levels, the Department may issue a schedule of compliance that requires the public water system to examine other treatment methods as a condition of obtaining a variance. If the Department determines that another treatment method is technically feasible, the Department may require the public water system to install and use that treatment method under a compliance schedule.~~

**~~G.H.~~** ~~A PWS that is not in compliance with a MCL may use an alternative technology, the removal of a source from service, or blending may be used to achieve compliance with a maximum contaminant level provided that a MCL if the alternative technology, source removal, or blending is approved, in writing, by the Department and is at least as effective as the best available technology identified in this Section.~~

**H.I.** No change

**ARTICLE 3. TREATMENT TECHNIQUES**

**R18-4-301. Surface Water Treatment**

- A.** A surface water system shall provide filtration and disinfection ~~which that~~ reliably achieves:
1. At least a 99.9% (3-log) removal and inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the ~~1st~~ first customer; ~~and~~
  2. At least a 99.99% (4-log) removal and inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the ~~1st~~ first customer; ~~and~~
  3. Effective May 1, 2002, a surface water system serving at least 10,000 persons shall provide at least a 99% (2-log) removal of *Cryptosporidium* oocysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

**Arizona Administrative Register**  
**Notices of Final Rulemaking**

- B. A surface water system ~~shall be considered to be~~ is in compliance with the *Giardia lamblia*, ~~and virus, and~~ *Cryptosporidium* removal and inactivation requirements prescribed in subsection (A) if the system provides filtration as prescribed by R18-4-302 and disinfection as prescribed in R18-4-303.
- C. A surface water system shall provide filtration and disinfection by June 29, 1993. A public water system with a source that is determined by the Department to be groundwater under the direct influence of surface water shall provide filtration and disinfection by June 29, 1993, or within 18 months of the date that the Department determines that the groundwater is under the direct influence of surface water, whichever is later. Failure to provide filtration and disinfection by the date specified in this subsection is a treatment technique violation.
- D. A surface water system ~~which that~~ has not installed filtration shall comply, before filtration is installed, with the interim maximum contaminant level and monitoring requirements for turbidity prescribed at R18-4-204 and any interim disinfection requirements prescribed by the Department that the Department considers necessary to protect public health.
- E. ~~Variances or exemptions~~ The Department shall not grant a variance or exemption from treatment technique requirements related to filtration and disinfection ~~are not allowed.~~

**R18-4-301.02. Control of Disinfection Byproduct Precursors by Enhanced Coagulation and Enhanced Softening**

- A. Effective May 1, 2002, a CWS or NTNCWS that serves 10,000 or more persons and is a surface water system that uses conventional filtration shall comply with enhanced coagulation or enhanced softening requirements unless the system meets at least one of the following alternate compliance criteria:
  - 1. Source water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average;
  - 2. Treated water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average;
  - 3. Running annual average for TTHM is less than or equal to 0.040mg/L and HAA5 is less than or equal to 0.030mg/L and chlorine is the only disinfectant used by the system;
  - 4. Source water SUVA is less than or equal to 2.0 L/mg-m, measured monthly and calculated quarterly as a running annual average;
  - 5. Treated SUVA is less than or equal to 2.0 L/mg-m, measured monthly and calculated quarterly as a running annual average;
  - 6. Softening that results in lowering treated water alkalinity to less than 60 mg/L (as CaCO<sub>3</sub>), measured monthly and calculated quarterly as a running annual average;
  - 7. Softening that results in removing at least 10 mg/L of magnesium hardness (as CaCO<sub>3</sub>), measured monthly and calculated quarterly as a running annual average; or
  - 8. Source water TOC is less than 4.0 mg/L, calculated quarterly as a running annual average, and source water alkalinity is greater than 60 mg/L (as CaCO<sub>3</sub>), calculated quarterly as a running annual average, and either the TTHM running annual average is less than or equal to 0.040 mg/L and the HAA5 running annual average is less than or equal to 0.030 mg/L, or if the system can submit evidence to the Department by the applicable compliance date in subsection (A) or (B) that a control technology will be installed and operating by June 30, 2005 with a schedule for the reduction of TTHM to 0.040 mg/L and HAA5 to 0.030 mg/L.
- B. Effective January 1, 2004 a CWS or NTNCWS that serves fewer than 10,000 persons and is a surface water system that uses conventional filtration shall comply with enhanced coagulation or enhanced softening requirements unless the system meets at least one of the alternate compliance criteria in subsections (A)(1) through (A)(8).
- C. A CWS or NTNCWS that is a surface water system that uses conventional filtration and that does not meet at least one of the alternate compliance criteria shall comply with the following enhanced coagulation and enhanced softening requirement as applicable:
  - 1. Step 1: The Step 1 TOC percent removal requirement is based on source water alkalinity and source water TOC. A system shall meet the Step 1 TOC percent removal as specified in Table 1 with respect to the system's existing source water TOC and source water alkalinity. A system that practices water softening shall meet the Step 1 TOC percent removal in the far right column of the table. A system shall meet the Step 1 TOC percent removal requirement until a Step 2 TOC removal requirement is approved by the Department.

**Table 1. Step 1 TOC Percent Removal**

| <b><u>Source Water TOC, mg/L</u></b> | <b><u>Source Water Alkalinity, mg/L as CaCO<sub>3</sub></u></b> |                          |                       |
|--------------------------------------|---|--------------------------|-----------------------|
|                                      | <b><u>0-60</u></b>  | <b><u>&gt;60-120</u></b> | <b><u>&gt;120</u></b> |
| <b><u>≥2.0-4.0</u></b>               | <b><u>35.0%</u></b>   | <b><u>25.0%</u></b>      | <b><u>15.0%</u></b>   |
| <b><u>&gt;4.0-8.0</u></b>            | <b><u>45.0%</u></b>   | <b><u>35.0%</u></b>      | <b><u>25.0%</u></b>   |
| <b><u>≥8.0</u></b>                   | <b><u>50.0%</u></b>   | <b><u>40.0%</u></b>      | <b><u>30.0%</u></b>   |

- 2. Step 2: A system that cannot meet the Step 1 TOC percent removal requirement due to water quality parameters or operational constraints shall request a Step 2 TOC removal requirement from the Department. A system shall submit the request within three months of the failure to achieve the TOC removal requirement in Step 1. The Step 2 TOC

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

removal requirement shall be based on an average of four consecutive quarters of bench- or pilot- scale testing performed by the system. A system shall include the results from bench- or pilot- scale testing in the request to the Department for an approval of a Step 2 TOC removal requirement. Once approved by the Department in writing, the Step 2 TOC removal requirement supersedes the Step 1 TOC removal requirement. A system shall meet the Department approved Step 2 TOC removal requirement until the system requests, and the Department approves, a new TOC removal requirement.

- a. The Step 2 TOC removal requirement is the percent removal of TOC at the point of diminishing return on the “TOC removal versus coagulant dose” curve under subsection (C)(2)(d) which results from bench- or pilot- scale testing.
- b. Bench- or pilot-scale testing shall be conducted by using representative water samples.
- c. Before the “TOC removal versus coagulant dose” test in subsection (C)(2)(d) is performed a system shall comply with the following procedure. 10 mg/L incremental doses of alum (or an equivalent amount of ferric salt) are added until the target pH on Table 2 is reached. The target pH is based on the alkalinity of the water. A system shall record the total amount of coagulant dose needed to reach the target pH.

**Table 2. Target pH for Step 2 TOC removal**

| <u>Alkalinity<br/>(mg/L as CaCO<sub>3</sub>)</u> | <u>Target pH</u> |
|--|------------------|
| <u>0-60</u>                                      | <u>5.5</u>       |
| <u>&gt;60-120</u>                                | <u>6.3</u>       |
| <u>&gt;120-240</u>                               | <u>7.0</u>       |
| <u>&gt;240</u>                                   | <u>7.5</u>       |

- d. The “TOC removal versus coagulant dose” is determined by adding incremental 10 mg/L doses of alum (or an equivalent amount of ferric salt) to the point where TOC removal is less than or equal to 0.3 mg/L and is within the target pH. Systems shall add additional coagulant past the dose needed to reach the target pH only if the water has low alkalinity.
- e. For water with alkalinity less than 60 mg/L for which the addition of small amounts of alum or equivalent amounts of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system shall add necessary chemicals to maintain the pH between 5.3 and 5.7 in the samples until the TOC removal of 0.3 mg/L per 10 mg/L alum or equivalent amount of iron coagulant is reached.

**D. Compliance:** After a system collects 12 months of data, the system shall determine the annual average of TOC percent removal using the following method:

1. Monthly TOC percent removal:

$$1 - \left( \frac{\text{Treated water TOC}}{\text{Source water TOC}} \right) \times 100$$

2. Monthly TOC percent removal ratio:

Monthly TOC percent removal value from (D)(1)  
 Step 1 or Step 2 percent reduction requirement

3. Annual average of TOC percent removal:

4. If the annual average of TOC percent removal calculated in subsection (D)(3) is less than 1, then the system is in violation of the TOC removal requirement. A system may assign a value of 1 for a month, instead of calculating the monthly TOC percent removal ratio in subsection (D)(2), for any of the following:

- a. A month the system’s treated or source water TOC level is less than 2.0 mg/L;
- b. A month the system practices softening that removes at least 10 mg/L of magnesium hardness (as CaCO<sub>3</sub>);
- c. A month that the system’s source water SUVA, prior to any treatment, is less than or equal to 2.0 L/mg-m;
- d. A month that the system’s finished water SUVA is less than or equal to 2.0 L/mg-m; or
- e. A month that a system practicing enhanced softening lowers alkalinity below 60 mg/L (as CaCO<sub>3</sub>).

5. A surface water system that meets at least one alternate compliance criteria listed under subsections (A)(1) through (A)(8) is in compliance with the TOC removal requirement.

6. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.

**Arizona Administrative Register**  
**Notices of Final Rulemaking**

---

7. A system that determines in the first 12 months after the applicable compliance date that it is not able to meet the Step 1 TOC percent removal requirements in subsection (C)(1) and applies for a Step 2 TOC removal requirement, is eligible for retroactive compliance with this Section if the Department approves a Step 2 TOC removal requirement as allowed in subsection (C)(2). A system may apply for a Step 2 TOC removal requirement any time after the compliance date.

**E. Waiver**

1. A system may submit a written request to the Department for a waiver of enhanced coagulation requirements. The system shall submit documentation of four consecutive quarters of bench- or pilot-scale tests for TOC removal. The bench- or pilot- scale tests shall demonstrate that the annual average of TOC removal is less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all doses of alum (or equivalent addition of iron coagulant). The Department's decision to approve or deny a waiver shall be in writing.
2. A waiver shall remain in effect until four quarters after the running annual average for TTHM is equal to or greater than 0.064 mg/L and the running annual average for HAA5 is equal to or greater than 0.048 mg/L. In the four quarters subsequent to the running annual average for TTHM equaling or exceeding 0.064 mg/L and the running annual average for HAA5 equaling or exceeding 0.048 mg/L, a system may perform four quarters of bench- or pilot- scale testing and submit the results to the Department to demonstrate that the TOC remains non-amenable to enhanced coagulation with a written request to renew the waiver. The Department's decision to renew or deny a waiver shall be in writing.
  - a. A system that conducts bench- or pilot- scale testing within four quarters after the running annual average for TTHM is equal to or greater than 0.064 mg/L and the running annual average for HAA5 is equal to or greater than 0.048 mg/L, may request Department approval of a Step 2 TOC removal requirement under subsection (C)(2) instead of a waiver renewal.
  - b. A system that does not request a waiver renewal or approval of a Step 2 TOC removal requirement from the Department shall comply with the Step 1 TOC removal requirement in subsection (C)(1) four quarters after the running annual average for TTHM is equal to or greater than 0.064 mg/L and the running annual average for HAA5 is equal to or greater than 0.048 mg/L.

**R18-4-302. Filtration**

- A. A surface water system shall treat water by filtration.
- B. Conventional or direct filtration: ~~The turbidity of filtered water shall be  $\leq$  0.5 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed 5 NTUs.~~
  1. For a system serving less than 10,000 people, the turbidity of filtered water shall be less than or equal to 0.5 NTU in at least 95% of the measurements collected each month. The turbidity of filtered water shall not exceed a maximum turbidity limit of 5 NTUs.
  2. Effective May 1, 2002, for a system serving at least 10,000 people, the turbidity of filtered water shall be less than or equal to 0.3 NTU in at least 95% of the measurements collected each month. The turbidity of filtered water shall not exceed a maximum turbidity limit of 1 NTU.
- C. Slow sand filtration: The turbidity of filtered water shall be  ~~$\leq$~~  less than or equal to 1 NTU in at least 95% of the measurements ~~taken~~ collected each month. The turbidity of filtered water shall not exceed a maximum turbidity limit of 5 NTUs.
- D. Diatomaceous earth filtration: The turbidity of filtered water shall be  ~~$\leq$~~  less than or equal to 1 NTU in at least 95% of the measurements ~~taken~~ collected each month. The turbidity of filtered water shall not exceed a maximum turbidity limit of 5 NTUs.
- E. Other filtration technologies: A surface water system may use a filtration technology other than conventional filtration, direct filtration, slow sand filtration, or diatomaceous earth filtration if the water supplier demonstrates to the Department, through pilot plant studies or other means, that the filtration technology, in combination with disinfection, ~~consistently achieves a 99.9% (3-log) removal and inactivation of *Giardia lamblia* cysts and a 99.99% (4-log) removal and inactivation of viruses. The turbidity of filtered water shall be  $\leq$  1 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed 5 NTUs.~~ consistently achieves the following:
  1. A 99.9% (3-log) removal and inactivation of *Giardia lamblia* cysts and a 99.99% (4-log) removal and inactivation of viruses, and
  2. The turbidity of filtered water is less than or equal to 1 NTU in at least 95% of the measurements collected each month and does not exceed 5 NTUs.
  3. Effective May 1, 2002, a surface water system that serves over 10,000 people shall, in addition, demonstrate to the Department, through pilot studies or other means, that the filtration technology consistently achieves a 99% (2-log) removal of *Cryptosporidium*.
- F. Frequency of turbidity monitoring: A surface water system shall take a grab sample and measure the turbidity of filtered water at least once every 4 ~~four~~ hours that a water treatment plant is operating or monitor turbidity continuously. If a surface water system continuously monitors the turbidity of filtered water, the water supplier shall calibrate its turbidity monitoring equipment regularly in accordance with the manufacturer's specifications.

**Arizona Administrative Register**  
**Notices of Final Rulemaking**

- G.** Location of turbidity monitoring: A surface water system shall monitor the turbidity of filtered water at + **one** of the following locations:
1. Combined filter effluent prior to entry into a clearwell,
  2. Clearwell effluent,
  3. Water treatment plant effluent, or
  4. Another location that is approved by the Department.
- H.** Reduced turbidity monitoring: Upon the written request of a water supplier, the Department may reduce the frequency of grab sampling for turbidity if the Department determines that less frequent turbidity monitoring is sufficient to indicate effective filtration performance. A Department decision to reduce turbidity monitoring shall be in writing. The Department may reduce turbidity monitoring as follows:
1. The Department may reduce the frequency of grab sampling by a surface water system using slow sand filtration or a filtration technology other than conventional filtration, direct filtration, or diatomaceous earth filtration to once per day;
  2. The Department may reduce the frequency of grab sampling by a surface water system that serves 500 or fewer persons to once per day, regardless of the type of filtration used.

**R18-4-303. Disinfection**

- A.** A surface water system shall provide disinfection sufficient to ensure that the total treatment processes of the system achieve at least a 99.9% (3-log) inactivation and removal of *Giardia lamblia* cysts and at least a 99.99% (4-log) inactivation and removal of viruses.
- B.** The residual disinfectant concentration in water entering the distribution system (measured as free chlorine, combined chlorine, or chlorine dioxide) shall be not less than 0.2 mg/L for more than + **four** consecutive hours.
1. A surface water system that serves more than 3,300 persons per day shall continuously monitor the residual disinfectant concentration in water entering the distribution system. If there is a failure of the continuous monitoring equipment, a surface water system shall take grab samples every + **four** hours to monitor residual disinfectant concentration. A surface water system shall repair or replace the continuous monitoring equipment within 5 **five** days of initial failure.
  2. A surface water system that serves 3,300 or fewer persons per day may take grab samples to monitor the residual disinfectant concentration in water entering the distribution system instead of continuous monitoring.
    - a. The surface water system shall sample each day at the following frequency:

| System size by population | Number of grab samples <u>+</u> per day <sup>1</sup> |
|---------------------------|--|
| 500 or less               | 1  |
| 501 to 1,000              | 3  |
| 1,001 to 2,500            | 3  |
| 2,501 to 3,300            | 4  |

<sup>1</sup>Grab samples shall not be ~~taken~~ collected at the same time. Sampling intervals are subject to Department review and approval for appropriateness.

- b. If the residual disinfectant concentration in a grab sample is < **less than** 0.2 mg/l, a surface water system shall increase the frequency of grab sampling to once every + **four** hours. The surface water system shall continue to take a grab sample every + **four** hours until the residual disinfectant concentration in water entering the distribution system is = **greater than or equal to** 0.2 mg/L.
- C.** The residual disinfectant concentration of water in the distribution system (measured as total chlorine, free chlorine, combined chlorine, or chlorine dioxide) shall be detectable in 95% or more of the samples each month for any ≥ **two** consecutive months that a surface water system serves water to the public.
1. A surface water system may measure the concentration of heterotrophic bacteria in water in the distribution system as heterotrophic plate count (HPC) instead of measuring the residual disinfectant concentration in water in the distribution system. Water in the distribution system with a heterotrophic bacteria concentration that is = **less than or equal to** 500/ml (measured as HPC) is deemed to have a detectable residual disinfectant concentration.
  2. The water supplier shall calculate the value “V” in the following formula to determine whether there is a detectable residual concentration in water in the distribution system in 95% of the samples ~~taken~~ collected each month. The value “V” shall not exceed 5 in each month for any ≥ **two** consecutive months:

$$V = \frac{c + d + e}{a + b} \times 100$$

Where:

a= Number of instances the residual disinfectant concentration is measured;

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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- b= Number of instances the residual disinfectant concentration is not measured but HPC is measured;
- c= Number of instances the residual disinfectant concentration is measured but not detected and no HPC is measured;
- d= Number of instances no residual disinfectant concentration is detected and the HPC is greater than 500/ml; and
- e= Number of instances the residual disinfectant concentration is not measured and HPC is greater than 500/ml.

3. The residual disinfectant concentration in water in the distribution system shall be measured at the same sampling sites and at the same time as total coliform sampling.
- D. A water supplier shall submit a treatment technique compliance study to the Department that demonstrates the total treatment processes of the surface water system achieve the *Giardia lamblia* and virus removal and inactivation rates prescribed in subsection (A). The water supplier shall submit an additional treatment technique compliance study if there is a change in the treatment process that may affect the percent removal or inactivation of *Giardia lamblia* cysts or viruses or an additional or different source is developed. A system that performed profiling under 40 CFR 141.172(b) shall consult with the Department before making any changes to the point of disinfection, the disinfectant used, or the disinfection process.

**R18-4-403. Renumbered Special Monitoring for Turbidity**

- A.** Effective May 1, 2002, a surface water system serving at least 10,000 people that uses conventional filtration or direct filtration, shall conduct continuous turbidity monitoring on each individual filter.
1. The system shall record the results of individual filter monitoring every 15 minutes.
  2. In the event of a failure in the continuous turbidity monitoring equipment, the system shall conduct grab sampling every four hours instead of continuous monitoring. The system shall conduct grab sampling for no more than five working days.
  3. For an individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements collected 15 minutes apart, the system shall complete a filter profile within seven days of the event if the system is not able to identify an obvious reason for the abnormal filter performance.
  4. For an individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements collected 15 minutes apart at or after four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system shall produce a filter profile within seven days of the event if the system is not able to identify an obvious reason for the abnormal filter performance.
  5. For an individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements collected 15 minutes apart at anytime in each of three consecutive months, the system shall conduct a self-assessment of the filter within 14 days of the event. A self-assessment of a filter shall contain an assessment of filter performance, development of filter profile, identification and prioritization of factors limiting filter performance, assessment of the applicability of corrections, and preparation of a filter self-assessment report.
  6. For an individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements collected 15 minutes apart at anytime in each of two consecutive months, the system shall arrange for a comprehensive performance evaluation to be conducted by the Department or a third party approved by the Department no later than 30 days after the event. A system shall make the modifications identified in a comprehensive performance evaluation report, except a system shall not implement a modification identified in a comprehensive performance evaluation if the Department determines that the modification does not improve the performance potential of the system.

**ARTICLE 7. CONSUMER CONFIDENCE ~~REPORT~~ REPORTS**

**R18-4-703. Content of ~~the~~ Consumer Confidence ~~Report~~ Reports**

- A. No change
1. No change
  2. No change
- B. No change
- C. Each CCR shall contain the following definitions:
1. "Maximum Contaminant Level" or "MCL" means the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology;
  2. "Maximum Contaminant Level Goal" or "MCLG" means the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety;
  3. "Maximum residual disinfectant level" or "MRDL" means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
  4. "Maximum residual disinfectant level goal" or "MRDLG" means the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- D. No change
- E. No change

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

1. No change
2. No change

**R18-4-704. Information on Detected Contaminants**

- A. A CCR shall contain information on the following detected contaminants:
1. Contaminants subject to ~~an~~ a MCL, MRDL, action level, or treatment technique (regulated contaminants), listed in Appendix A of Article 1; and
  2. Contaminants listed in ~~Appendix B~~ listed in Table 1.
- B. No change
1. No change
  2. No change
  3. No change
  4. No change
    - a. No change
    - b. No change
    - c. No change
  5. No change
  6. No change
  7. No change
    - a. No change
    - b. No change
  8. No change
  9. No change
- C. The table shall clearly identify any data indicating a violation of a MCL, MRDL, or treatment technique.
- D. No change
- E. For a detected contaminant listed in ~~Appendix B~~ Table 1, the CCR table shall contain the average and range at which the contaminant was detected. The CCR may include a brief explanation of the reasons for monitoring for these contaminants.
- F. No Change

**Table 1. EPA Required Monitoring for Unregulated Contaminants**

|   |                               |                                 |
|---|-------------------------------|---------------------------------|
| <u>A CWS serving 100,000 or more persons that is required to monitor for the following disinfection by-products and microbial contaminants under 40 CFR 141.142 and 141.143, shall include the results of the most recent sampling in the CCR, and shall report the average and range of results for a contaminant that is detected. Results shall be included in a CCR for five years from the date of the last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements under this Chapter, whichever comes first.</u> |                               |                                 |
| <u>Haloacetic Acids*</u>  | <u>Haloacetonitrile</u>       | <u>Haloketones</u>              |
| <u>Chlorite*</u>  | <u>Chloral Hydrate</u>        | <u>Total Organic Halides</u>    |
| <u>Bromate*</u>   | <u>Chloropicrin</u>           | <u>Aldehydes</u>                |
| <u>Cyanogen Chloride</u>  | <u>Chlorate</u>               | <u>Total Culturable Viruses</u> |
| <u>*MCLs and monitoring requirements become effective May 1, 2002 for a CWS that use surface water and serves more than 10,000 people.</u>  |                               |                                 |
| <u>A CWS required to monitor for the following contaminants under 40 CFR 141.40 shall include the results of the most recent sampling and shall report the average and range of results for the contaminant that was detected. Results from at least the previous year shall be included.</u>   |                               |                                 |
| <u>Assessment Monitoring</u>  |                               |                                 |
| <u>2,4-dinitrotoluene</u>   | <u>2,6-dinitrotoluene</u>     | <u>Acetochlor</u>               |
| <u>DCPA Mono-acid Degradate</u>   | <u>DCPA Di-acid Degradate</u> | <u>4,4'-DDE</u>                 |
| <u>EPTC</u>   | <u>Molinate</u>               | <u>MTBE</u>                     |
| <u>Nitrobenzene</u>   | <u>Perchlorate</u>            | <u>Terbacil</u>                 |
| <u>Screening Survey</u>   |                               |                                 |
| <u>1,2-diphenylhydrazine</u>  | <u>2-methyl-phenol</u>        | <u>2,4-dichlorophenol</u>       |
| <u>2,4-dinitrophenol</u>  | <u>2,4,6-trichlorophenol</u>  | <u>Diazinon</u>                 |
| <u>Disulfoton</u>   | <u>Diuron</u>                 | <u>Fonofos</u>                  |
| <u>Linuron</u>  | <u>Low-level Nitrobenzene</u> | <u>Prometon</u>                 |
| <u>Terbufos</u>   | <u>Alachlor Esa</u>           | <u>Polonium-210</u>             |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

**R18-4-706. Information on Violations**

A CCR shall contain a clear, understandable explanation of any violation that occurred during the year covered by the CCR, the length of the violation, an explanation of any potential adverse health effects, the health effects language from ~~Appendix C Article 1, Appendix A~~, and the steps the CWS has taken to correct a violation of any of the following:

1. A MCL, MRDL, treatment technique, or action level;
2. No change
3. No change
4. No change
5. No change
6. No change
7. No change

**R18-4-709. Additional Health Information**

- A. No change
- B. A CWS that detects arsenic ~~at levels more than .025 milligrams per liter~~ above 0.005 mg/L, but less than the MCL and up to and including 0.01 mg/L, shall include in its CCR a short informational statement about arsenic. The CWS may create its own informational statement, in consultation with the Department, or the CWS may use the following language:

~~“The EPA is reviewing the drinking water standard for arsenic because of special concerns that it may not be stringent enough. Arsenic is a naturally occurring mineral known to cause cancer in humans at high concentrations.”~~

“While your drinking water meets EPA’s standard for arsenic, it does contain low levels of arsenic. EPA’s standard balances the current understanding of arsenic’s possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.”

- C. A CWS that detects arsenic above 0.01 mg/L, and up to and including 0.05 mg/L, shall include in its CCR the arsenic health effects language in Appendix A of Article 1.

~~C.D.~~ No change

~~D.E.~~ No change

**Appendix A. ~~Regulated Contaminants Repealed~~**

| Microbiological Contaminants         | MCL   | MCLG | Major Sources in Drinking Water       |
|--------------------------------------|---|------|---------------------------------------|
| 1. Total Coliform Bacteria           | Presence of coliform bacteria in 5% or more of monthly samples (CWSs that collect 40 or more samples per month); 1 positive monthly sample (CWSs that collect fewer than 40 samples per month). | 0    | Naturally present in the environment. |
| 2. Fecal coliform and <i>E. coli</i> | A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or <i>E. coli</i> positive   | 0    | Human and animal fecal waste.         |
| 3. Turbidity                         | Treatment Technique   | N/A  | Soil Run-off Runoff                   |

| Radioactive Contaminants | MCL                 | MCLG | Major Sources in Drinking Water         |
|--------------------------|---------------------|------|---|
| 4. Beta/photon emitters  | 4 Millirems/ Year   | 0    | Decay of natural and man made deposits. |
| 5. Alpha emitters        | 15 Picocuries/Liter | 0    | Erosion of natural deposits.            |
| 6. Combined radium       | 5 Picocuries/ Liter | 0    | Erosion of natural deposits.            |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

| <b>Inorganic Contaminants</b> | <b>MCL in mg/L</b>     | <b>MCLG in mg/L</b>     | <b>Major Sources in Drinking Water</b>   |
|-------------------------------|------------------------|-------------------------|--|
| 7. Antimony                   | .006                   | .006                    | Discharge from Petroleum refineries; Fire retardants; Ceramics; Electronics; Solder.   |
| 8. Arsenic                    | .05                    | N/A                     | Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.                              |
| 9. Asbestos                   | 7 Million Fibers/Liter | 7 Million Fibers /Liter | Decay of asbestos cement water mains; Erosion of natural deposits.   |
| 10. Barium                    | 2                      | 2                       | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.  |
| 11. Beryllium                 | .004                   | .004                    | Discharge from metal refineries and coal burning factories; Discharge from electrical, aerospace, and defense industries.            |
| 12. Cadmium                   | .005                   | .005                    | Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints. |
| 13. Chromium                  | .1                     | .1                      | Discharge from steel and pulp mills; Erosion of natural deposits.  |
| 14. Copper                    | Action Level =1.3      | 1.3                     | Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.                              |
| 15. Cyanide                   | .2                     | .2                      | Discharge from steel or metal factories; Discharge from plastic and fertilizer factories.  |
| 16. Fluoride                  | 4.0                    | 4.0                     | Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories.            |
| 17. Lead                      | Action Level =.015     | 0                       | Corrosion of household plumbing systems; Erosion of natural deposits.  |
| 18. Mercury                   | .002                   | .002                    | Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.                   |
| 19. Nitrate                   | 10                     | 10                      | Runoff from fertilizer use; Leaching from septic tanks, or sewage; Erosion of natural deposits.                                      |
| 20. Nitrite                   | .1                     | .1                      | Runoff from fertilizer use; Leaching from septic tanks, or sewage; Erosion of natural deposits.                                      |

*Arizona Administrative Register*

**Notices of Final Rulemaking**

|              |      |       |   |
|--------------|------|-------|---|
| 21. Selenium | .05  | .05   | Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines. |
| 22. Thallium | .002 | .0005 | Leaching from ore processing sites; Discharge from electronics, glass, and drug factories.        |

| <b>Synthetic Organic Contaminants including Pesticides and Herbicides</b> | <b>MCL in mg/L</b>  | <b>MCLG in mg/L</b> | <b>Major Sources in Drinking Water</b>   |
|---|---------------------|---------------------|--|
| 23. 2,4-D   | .07                 | .07                 | Runoff from herbicide used on row crops.   |
| 24. 2,4,5-TP [Silvex]   | .05                 | .05                 | Residue of banned herbicide.   |
| 25. Acrylamide  | Treatment Technique | 0                   | Added to water during sewage or wastewater treatment.  |
| 26. Alachlor  | .002                | 0                   | Runoff from herbicide used on row crops.   |
| 27. Atrazine  | .003                | .003                | Runoff from herbicide used on row crops.   |
| 28. Benzo(a)pyrene [PAH]  | .0002               | 0                   | Leaching from linings of water storage tanks and distribution lines.                         |
| 29. Carbofuran  | .04                 | .04                 | Leaching of soil fumigant used on rice and alfalfa.  |
| 30. Chlordane   | .002                | 0                   | Residue of banned termiticide.   |
| 31. Dalapon   | .2                  | .2                  | Runoff from herbicide used on rights of way.   |
| 32. Di(2-ethylhexyl) adipate  | .4                  | .4                  | Discharge from chemical factories.   |
| 33. Di(2-ethylhexyl) phthalate  | .006                | 0                   | Discharge from rubber and chemical factories.  |
| 34. Dibromochloropropane (DBCP)   | .0002               | 0                   | Runoff or leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.    |
| 35. Dinoseb   | .007                | .007                | Runoff from herbicide used on soybeans and vegetables.                                       |
| 36. Diquat  | .02                 | .02                 | Runoff from herbicide use.   |
| 37. Dioxin [2,3,7,8-TCDD]   | .00000003           | 0                   | Emissions from waste incineration and other combustion; Discharge from chemical factories.   |
| 38. Endothall   | .1                  | .1                  | Runoff from herbicide use.   |
| 39. Endrin  | .002                | .002                | Residue of banned insecticide.   |
| 40. Epichlorohydrin   | Treatment Technique | 0                   | Discharge from industrial chemical factories; An impurity of some water treatment chemicals. |
| 41. Ethylene dibromide  | .00005              | 0                   | Discharge from petroleum refineries.   |
| 42. Glyphosate  | .7                  | .7                  | Runoff from herbicide use.   |
| 43. Heptachlor  | .0004               | 0                   | Residue of banned pesticide.   |
| 44. Heptachlor epoxide  | .0002               | 0                   | Breakdown of heptachlor.   |
| 45. Hexachlorobenzene   | .001                | 0                   | Discharge from metal refineries and agricultural chemical factories.                         |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

|                                      |       |       |  |
|--------------------------------------|-------|-------|--|
| 46. Hexachloroeyelopentadiene        | .05   | .05   | Discharge from chemical factories.   |
| 47. Lindane                          | .0002 | .0002 | Runoff or leaching from insecticide used on cattle, lumber, and gardens.               |
| 48. Methoxyehlor                     | .04   | .04   | Runoff or leaching from insecticide used on fruits, vegetables, alfalfa, or livestock. |
| 49. Oxamyl [Vydate]                  | .2    | .2    | Runoff or leaching from insecticide used on apples, potatoes and tomatoes.             |
| 50. PCBs [Polychlorinated biphenyls] | .0005 | 0     | Runoff from landfills; Discharge of waste chemicals.                                   |
| 51. Pentachlorophenol                | .001  | 0     | Discharge from wood preserving factories.  |
| 52. Picloram                         | .5    | .5    | Runoff from herbicide.   |
| 53. Simazine                         | .004  | .004  | Runoff from herbicide.   |
| 54. Toxaphene                        | .003  | 0     | Runoff/leaching from insecticide used on cotton and cattle.                            |

| <b>Volatile Organic Contaminants</b> | <b>MCL in mg/L</b> | <b>MCLG in mg/L</b> | <b>Major Sources in Drinking Water</b>                                   |
|--------------------------------------|--------------------|---------------------|--|
| 55. Benzene                          | .005               | 0                   | Discharge from factories; Leaching from gas storage tanks and landfills. |
| 56. Carbon tetrachloride             | .005               | 0                   | Discharge from chemical plants and other industrial activities.          |
| 57. Chlorobenzene                    | .1                 | .1                  | Discharge from chemical and agricultural chemical factories.             |
| 58. o Dichlorobenzene                | .6                 | .6                  | Discharge from industrial chemical factories.                            |
| 59. para Dichlorobenzene             | .075               | .075                | Discharge from industrial chemical factories.                            |
| 60. 1,2 Dichloroethane               | .005               | 0                   | Discharge from industrial chemical factories.                            |
| 61. 1,1 Dichloroethylene             | .007               | .007                | Discharge from industrial chemical factories.                            |
| 62. cis 1,2 Dichloroethylene         | .07                | .07                 | Discharge from industrial chemical factories.                            |
| 63. trans 1,2 Dichloroethylene       | .1                 | .1                  | Discharge from industrial chemical factories.                            |
| 64. Dichloromethane                  | .005               | 0                   | Discharge from pharmaceutical and chemical factories.                    |
| 65. 1,2 Dichloropropane              | .005               | 0                   | Discharge from industrial chemical factories.                            |
| 66. Ethylbenzene                     | .7                 | .7                  | Discharge from petroleum refineries.                                     |
| 67. Styrene                          | .1                 | .1                  | Discharge from rubber and plastic factories; Leaching from landfills.    |
| 68. Tetrachloroethylene              | .005               | 0                   | Discharge from factories and dry cleaners.                               |
| 69. 1,2,4 Trichlorobenzene           | .07                | .07                 | Discharge from textile finishing factories.                              |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

|                                      |      |      |  |
|--------------------------------------|------|------|--|
| 70. 1,1,1-Trichloroethane            | .2   | .2   | Discharge from metal degreasing sites and other factories.                           |
| 71. 1,1,2-Trichloroethane            | .005 | .003 | Discharge from industrial chemical factories.  |
| 72. Trichloroethylene                | .005 | 0    | Discharge from metal degreasing sites and other factories.                           |
| 73. TTHMs<br>[Total trihalomethanes] | .1   | N/A  | Byproduct of drinking water chlorination.  |
| 74. Toluene                          | 1    | 1    | Discharge from petroleum factories.  |
| 75. Vinyl Chloride                   | .002 | 0    | Leaching from PVC (polyvinyl chloride) piping;<br>Discharge from plastics factories. |
| 76. Xylenes                          | 10   | 10   | Discharge from petroleum factories;<br>Discharge from chemical factories.            |

**Appendix B. Required Monitoring for Unregulated Contaminants Repealed**

A CWS serving 100,000 or more persons required to monitor for the following disinfection by-products and microbial contaminants per 40 CFR 141.142 and 141.143 shall include the results of the most recent sampling and shall report the average and range of results for the contaminant that was detected. Results need only be included for five years from the date of the last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

|                   |                  |                          |
|-------------------|------------------|--------------------------|
| Haloacetic Acids* | Haloacetonitrile | Haloketones              |
| Chlorite*         | Chloral Hydrate  | Total Organic Halides    |
| Bromate*          | Chloropierin     | Aldehydes                |
| Cyanogen Chloride | Chlorate         | Total Culturable Viruses |

*\*MCLs and monitoring requirements will become effective January 1, 2002 for a CWS that uses surface water and that serves more than 10,000 persons.*

A CWS required to monitor for the following contaminants per 40 CFR 141.40, shall include the results of the most recent sampling and shall report the average and range of results for the contaminant that was detected. Only results from the previous year need to be included.

| Assessment Monitoring    |                        |            |
|--------------------------|------------------------|------------|
| 2,4-dinitrotoluene       | 2,6-dinitrotoluene     | Acetochlor |
| DCPA Mono-Acid Degradate | DCPA Di-acid Degradate | 4,4'-DDE   |
| EPTC                     | Molinate               | MTBE       |
| Nitrobenzene             | Perchlorate            | Terbacil   |

| Screening Survey      |                        |                    |
|-----------------------|------------------------|--------------------|
| 1,2-diphenylhydrazine | 2-methyl phenol        | 2,4-dichlorophenol |
| 2,4-dinitrophenol     | 2,4,6-trichlorophenol  | Diazinon           |
| Disulfoton            | Diuron                 | Fonofos            |
| Linuron               | Low-level Nitrobenzene | Prometon           |
| Terbufos              | Alachlor ESA           | Polonium-210       |
| RDX                   | <i>Aeromonas</i>       |                    |

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

| Pre-screen Testing |                     |               |
|--------------------|---------------------|---------------|
| Lead-210           | Cyanobacteria       | Echoviruses   |
| Coxsackieviruses   | Helicobacter Pylori | Microsporidia |
| Calciwiruses       | Adenoviruses        |               |

**Appendix C. ~~Health Effects Language Repealed~~**

**Microbiological Contaminants**

1. ~~Total Coliform. Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.~~
2. ~~Fecal coliform/*E. Coli*. Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.~~
3. ~~Turbidity. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.~~

**Radioactive Contaminants**

4. ~~Beta/photon emitters. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.~~
5. ~~Alpha emitters. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.~~
6. ~~Combined Radium 226/228. Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.~~

**Inorganic Contaminants**

7. ~~Antimony. Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.~~
8. ~~Arsenic. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.~~
9. ~~Asbestos. Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.~~
10. ~~Barium. Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.~~
11. ~~Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.~~
12. ~~Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.~~
13. ~~Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.~~
14. ~~Copper. Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.~~
15. ~~Cyanide. Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.~~
16. ~~Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.~~
17. ~~Lead. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.~~
18. ~~Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.~~
19. ~~Nitrate. Infants below the age of 6 months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.~~

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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20. Nitrite. Infants below the age of 6 months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
21. Selenium. Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
22. Thallium. Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
- ~~Synthetic Organic Contaminants Including Pesticides and Herbicides~~
23. 2,4-D. Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
24. 2,4,5-TP (Silvex). Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
25. Acrylamide. Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
26. Alachlor. Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
27. Atrazine. Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
28. Benzo(a)pyrene (PAH). Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
29. Carbofuran. Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
30. Chlordane. Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
31. Dalapon. Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
32. Di (2-ethylhexyl) adipate. Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties.
33. Di (2-ethylhexyl) phthalate. Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
34. Dibromochloropropane (DBCP). Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
35. Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
36. Dioxin (2,3,7,8-TCDD). Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
37. Diquat. Some people who drink water containing diquat in excess of the MCL over many years could get cataracts
38. Endothall. Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
39. Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
40. Epichlorohydrin. Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
41. Ethylene dibromide. Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
42. Glyphosate. Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
43. Heptachlor. Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
44. Heptachlor epoxide. Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
45. Hexachlorobenzene. Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
46. Hexachlorocyclopentadiene. Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.

*Arizona Administrative Register*  
**Notices of Final Rulemaking**

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47. Lindane. Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
48. Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
49. Oxamyl [Vydate]. Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
50. PCBs [Polychlorinated biphenyls]. Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
51. Pentachlorophenol. Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
52. Picloram. Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
53. Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
54. Toxaphene. Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
- Volatile Organic Contaminants
55. Benzene. Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
56. Carbon Tetrachloride. Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
57. Chlorobenzene. Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
58. o-Dichlorobenzene. Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
59. p-Dichlorobenzene. Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
60. 1,2-Dichloroethane. Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
61. 1,1-Dichloroethylene. Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
62. cis-1,2-Dichloroethylene. Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
63. trans-1,2-Dichloroethylene. Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
64. Dichloromethane. Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
65. 1,2-Dichloropropane. Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
66. Ethylbenzene. Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
67. Styrene. Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
68. Tetrachloroethylene. Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
69. 1,2,4-Trichlorobenzene. Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
70. 1,1,1-Trichloroethane. Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
71. 1,1,2-Trichloroethane. Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
72. Trichloroethylene. Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
73. THIMs [Total Trihalomethanes]. Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
74. Toluene. Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.

75. Vinyl Chloride. Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
76. Xylenes. Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.