

## NOTICES OF PUBLIC INFORMATION

Notices of Public Information contain corrections that agencies wish to make to their notices of rulemaking; miscellaneous rule-making information that does not fit into any other category of notice; and other types of information required by statute to be published in the *Register*. Because of the variety of material that is contained in a Notice of Public Information, the Office of the Secretary of State has not established a specific format for these notices.

### NOTICE OF PUBLIC INFORMATION

#### DEPARTMENT OF ENVIRONMENTAL QUALITY

[M06-224]

1. **A.R.S. Title and its heading:** 49, The Environment  
**A.R.S. Chapter and its heading:** 2, Water Quality Control  
**A.R.S. Article and its heading:** 2.1, Total Maximum Daily Loads  
**Section:** A.R.S. § 49-234, Total maximum daily loads; implementation plans
2. **The public information relating to the listed statute:**

Pursuant to A.R.S. § 49-234, the Arizona Department of Environmental Quality (Department or ADEQ) is required to develop a total maximum daily load (TMDL) for navigable waters that are listed as impaired. The purpose of this notice is to publish the Department's determinations of total pollutant loadings for a TMDL in Alamo Lake that the Department intends to submit to the Regional Administrator for Region 9, U.S. Environmental Protection Agency (EPA) for approval.

The Department previously provided public notice and an opportunity for public comment on the draft "Alamo Lake TMDL" in the local Wickenburg newspaper of general circulation in the affected area, on December 28, 2005. The Department received only one comment letter from the Phoenix office of the U.S. Fish and Wildlife Service based on that notice. The purpose of this notice is to satisfy A.R.S. §§ 49-234(D) and 49-234(E), which require the Department to publish in the *Arizona Administrative Register* the determination of total pollutant loadings that will not result in impairment and the proposed allocations among the contributing sources that are sufficient to achieve the total pollutant loadings.

### **3. Total Maximum Daily Loads (TMDLs)**

#### **A. Total Maximum Daily Load (TMDL) Process**

TMDL represents the total load of a pollutant that can be assimilated by a waterbody on a daily basis and still meet the applicable water quality standard. The TMDL can be expressed as the total mass or quantity of a pollutant that can enter the waterbody within a unit of time. In most cases, the TMDL determines the allowable pounds per day of a pollutant and divides it among the various contributors in the watershed as wasteload (i.e., point source discharge) and load (i.e., nonpoint source) allocations. The TMDL must also account for natural background sources and provide a margin of safety. For nonpoint sources such as accelerated erosion or internal nutrient cycling, it may not be feasible or useful to derive a figure in terms of pounds per day. In such cases, a percent reduction in pollutant loading may be proposed. A load analysis may take the form of a phased TMDL, if source reduction or remediation can be better accomplished through an iterative approach.

In Arizona, as in other states, changes in standards or the establishment of site-specific standards are the result of ongoing science-based investigations or changes in toxicity criteria from EPA. Changes in designated uses and standards are part of the surface water standards triennial review process and are subject to public review. Standards are not changed simply to bring the waterbody into compliance, but are based on sound science that includes evaluation of the risk of impact to humans or aquatic and wildlife. Existing uses of the waterbody and natural conditions are considered when standards for specific water segments are established.

These TMDLs meet or exceed the following EPA Region 9 criteria for approval:

**Plan to meet State Surface Water Quality Standards:** The TMDLs include a study and a plan for the specific pollutants that must be addressed to ensure that applicable water quality standards are attained.

**Describe quantified water quality goals, targets, or endpoints:** The TMDL must establish numeric endpoints for the water quality standards, including beneficial uses to be protected, as a result of implementing the TMDLs. This often requires an interpretation that clearly describes the linkage(s) between factors impacting water quality standards.

**Analyze/account for all sources of pollutants:** All significant pollutant sources are described, including the magnitude and location of sources.

**Identify pollution reduction goals:** The TMDL plan includes pollutant reduction targets for all point and nonpoint sources of pollution.

**Describe the linkage between water quality endpoints and pollutants of concern:** The TMDLs must explain the relationship between the numeric targets and the pollutants of concern. That is, do the recommended pollutant load allocations exceed the loading capacity of the receiving water?

**Develop margin of safety that considers uncertainties, seasonal variations, and critical conditions:** The TMDLs must describe how any uncertainties regarding the ability of the plan to meet water quality standards that have been addressed. The plan must consider these issues in its recommended pollution reduction targets.

**Provide implementation recommendations for pollutant reduction actions and a monitoring plan:** The TMDLs should provide a specific process and schedule for achieving pollutant reduction targets. A monitoring plan should also be included, especially where management actions will be phased in over time and to assess the validity of the pollutant reduction goals.

**Include an appropriate level of public involvement in the TMDL process:** This is usually met by publishing public notice of the TMDLs in a newspaper of general circulation in the area affected by the study, circulating the TMDLs for public comment, and holding public meetings in local communities. Public involvement must be documented in the state's TMDL submittal to EPA Region 9.

**In addition, these TMDLs comply with the public notification requirements of A.R.S. Title 49, Chapter 2, Article 2.1:** Publication of these TMDLs in the *Arizona Administrative Register* is required per Arizona Revised Statute, Title 49, Chapter 2, Article 2.1 prior to submission of the TMDL to EPA. The Department shall:

1. Prepare a draft estimate of the total amount of each pollutant that causes impairment from all sources that may be added to a navigable water while still allowing the navigable water to achieve and maintain applicable surface water quality standards, and provide public notice and an opportunity for comment in a newspaper of general circulation in the affected area;
2. Publish a notice in the *Arizona Administrative Register* (this notice) of the determination of total pollutant loadings that will not result in impairment, a summary of comments received to the initial TMDL public notice, and the Department's responses to the comments;
3. Make reasonable and equitable allocations among TMDL sources, and provide public notice and an opportunity for comment in a newspaper of general circulation in the affected area;
4. Publish a notice in the *Arizona Administrative Register* (this notice) of the allocations among contributing sources, along with responses to any comments received on the draft allocations in a newspaper of general circulation.

Federal law only requires the submittal of the pollutant loadings to EPA for approval. However, the Department considers the pollutant loadings and the draft allocations to be integrally related and should be presented together to afford the public a complete understanding of the issues, outcomes and recommendations of the TMDL analysis. For that reason, the Department has combined the loadings and allocations in both the public notice in the local newspaper as well as in this publication in the *Arizona Administrative Register*.

### **B. Total Maximum Daily Load for Alamo Lake**

#### **EXECUTIVE SUMMARY**

Section 303(d) of the Clean Water Act requires each state to develop Total Maximum Daily Loads (TMDLs) for surface waters that do not meet and maintain applicable water quality standards. A TMDL establishes the amount of a given pollutant that the waterbody can withstand without creating an impairment of that surface water's designated use. The TMDL by definition (40 Code of Federal Regulations Part 130) is the sum of all point and non-point sources with the inclusion of a margin of safety and natural background considerations.

Alamo Lake, a flood control reservoir on the Bill Williams River, located at the intersection of Mohave, Yavapai, and La Paz counties, appeared on the Arizona Department of Environmental Quality's 2002 List of Water Quality Limited Waters for exceedance of national fish tissue criteria for mercury and Arizona Surface Water Quality Standards for ammonia and pH. Specific surface water quality standards for these parameters are listed in Title 18, Chapter 11 of the Arizona Administrative Code. For this TMDL investigation, samples were collected to discern pollutant sources, the extent of impairment, and allow for the calculation of pollutant loads and allocations. Sample results may support delisting ammonia and pH, but this TMDL does not address these parameters. The TMDL developed for mercury in fish tissue reflects both watershed and in-lake water quality and suspended sediment targets.

The significant sources of pollutants are parent geology and soils, hard rock and placer mining, and aerial deposition. Ownership and management of Alamo Lake is shared between the U.S. Bureau of Reclamation (BOR), the U.S. Army Corps of Engineers (ACOE), the Bureau of Land Management (BLM), the Arizona State Parks Service (ASP), and the Arizona Game and Fish Department (AGFD). Routine monitoring is conducted by the U.S. Fish and Wildlife Service (USFWS) for ACOE. TMDL sampling was conducted by ADEQ between 2002 and 2005.

In August 2004, ADEQ hired a contractor (Tetra Tech, Inc.) to develop a Load Analysis Study for Alamo Lake. The Load Analysis incorporated chemical and geospatial data and applied both empirical and computer modeling.

WATERSHED OVERVIEW

Waterbody:	Alamo Lake
Drainage:	4,700 square miles
Designated Uses:	Aquatic & Wildlife, warm water; Fish consumption; Full body contact & Agriculture livestock watering
Communities:	Wendon
County:	Mohave; Yavapai; La Paz
Land Ownership:	BLM; U.S. Forest Service; State Land; Private
Land Use:	Undeveloped; grazing/ranching; mining; rural communities; forest
Principal Geology:	Basin and Range
Potential Sources:	Geologic, aerial, industry, mining

LOADS AND ALLOCATIONS

The range of data and information used to develop this TMDL included GIS coverages, meteorological data, stream monitoring data, lake monitoring and morphological data. The lake monitoring data used to determine impairment for the 303(d) listing were collected in 2001 for mercury in fish tissue, and 1992-2002 for lake chemistry data. Lake data were collected bimonthly by the USFWS for the USCOE. Fish tissue data were collected by ADEQ and AGFD.

Existing Loads

Existing Loadings from Alamo Lake watershed runoff were evaluated using three approaches:

1. Total sediment-associated mercury load passing a mainstem site estimated from the mercury concentration and the upstream sediment load, discounted with an area-based delivery ratio. Use of the delivery ratio based on drainage area also allows conversion of the estimated load passing a site to the source load. Multiplying the source load times the delivery ratio to the downstream site gives the “exerted” load from a given area – the load that is present at the downstream station. This analysis suggests that source loads, on a per-acre basis, are higher in the Big Sandy watershed than in other upstream portions of the watershed. Further, mercury concentrations observed in sediment in the Big Sandy are similar to those from the Bill Williams River. Thus, sources in the Big Sandy may have played a role in past contamination of the lower reaches of the system.
2. The sediment-associated mercury loads directly predicted by the Watershed Characterization System (WCS) Mercury Tool were also routed to estimate the loads at the four major watershed sites. Sediment-associated mercury loads at the subbasin outlets were determined after accounting for the tributary losses. The loadings at each location was then determined using the area-based delivery ratio. Except for the loads at Burro Creek, the loads predicted by WCS were lower than those estimated using the sediment mercury concentration measurements. These differences may again result from mercury sources unaccounted for in the WCS Mercury Tool. The difference between the sediment-associated mercury load estimates by the sediment mercury concentration measurement method and WCS Mercury Tool were compared with the number of mines within the corresponding subbasins. A positive, but weak, correlation between the anomalies and number of mines can be seen. This suggests that mining activities may account for a portion of the unaccounted load. However, the number of mines alone does not account for the elevated loads from the Big Sandy. In addition, the number and size of historic fires appears to have played a role.
3. Load duration curves at three USGS gage sites, based on continuous discharge data and associated mercury and suspended sediment concentration data were generated for prediction of mercury loads under different flow conditions. These estimations, seen in the following table, were the most conservative of the three methods, relied on empirical data, and were ultimately used to set the TMDL and allocations.

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<b>Watershed</b>	<b>Average Year Existing Load (g/year)</b>	<b>Percent Reduction</b>	<b>TMDL (g/year)</b>
Big Sandy River	5,363	86.8%	708
Burro Creek	5,000	86.8%	660
Santa Maria River	2,868	86.8%	379
<b>Total</b>	<b>13,230</b>	<b>86.8%</b>	<b>1,746</b>

Load Allocations

Load allocations for this TMDL have been set at each of the three main tributary sites: the Big Sandy River at Highway 93, Burro Creek at the USGS station just downstream of Highway 93, and the Santa Maria at Highway 93. The TMDL study captured a broad range of tributary flows. As a result, it was prudent to set allocations based on average year loading and wet year loading, as seen in the following table. Although data collected upstream of these locations suggested relative areas of higher-than-expected-mercury concentrations, further investigation is needed for more refined source allocation.

<b>Watershed</b>	<b>Average Year Load Allocation (g/year)</b>	<b>Wet Year Existing Load (g/yr)</b>	<b>Wet Year Load Allocation (g/year)</b>
Big Sandy River	708	50,879	6,716
Burro Creek	660	45,900	6,059
Santa Maria River	379	14,224	1,878
<b>Total</b>	<b>1,746</b>	<b>111,003</b>	<b>14,652</b>

A TMDL is the total amount of a pollutant that can be assimilated by the receiving water while still achieving water quality standards. TMDLs can be expressed in terms of mass per time or by other appropriate measures. TMDLs are composed of the sum of individual wasteload allocations (WLA) for point sources, and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL contains an explicit margin of safety (MOS) to account for differences between modeled and monitored data. Conceptually, this definition is denoted by the equation:

$$\text{TMDL} = \Sigma\text{WLA} + \Sigma\text{LA} + \text{MOS}$$

$$\text{Average Year TMDL} = 0* (\text{WLA}) + 379 \text{ g/yr (LA for Santa Maria River)} + 660 \text{ g/yr (LA for Burro Creek)} + 708 \text{ g/yr (LA for Big Sandy)} + \text{Implicit MOS}$$

\* WLA set at "0" unless/until specific point source(s) identified

$$\text{Wet Year TMDL} = 0* (\text{WLA}) + 1,878 \text{ g/yr (LA for Santa Maria River)} + 6,059 \text{ g/yr (LA for Burro Creek)} + 6,716 \text{ g/yr (LA for Big Sandy River)} + \text{Implicit MOS}$$

\* WLA set at "0" unless/until specific point source(s) identified

This TMDL will meet the existing water quality standards for A&W-warm protection in Alamo Lake: acute standard of 2.4 ug/L (2,400 ng/L) dissolved mercury and chronic standard of 0.01 ug/L (10 ng/L), the existing Fish Consumption standard of 0.6 ug/L (600 ng/L) total mercury, and the trophic-level (T-L) 4 fish tissue target of 0.21 mg/kg. In meeting the 0.21 mg/kg TL-4 fish tissue target, which includes largemouth bass and crappie, the TMDL will also meet the human health fish tissue target of 0.3 mg/kg. Targets have been established based on the relationship of linearity between increasing methyl-mercury in water and impairments to the food chain.

#### IMPLEMENTATION

LAs were quantified based on total loads predicted for each major watershed. At this time, LAs do not consider individual sources within each watershed that contribute to those loads. Additional source identification is needed in order to refine or partition LAs higher in each sub-watershed. Modeling analysis was performed to provide assessment of sources that can be used for guidance in TMDL implementation. Distribution of LAs among watershed sources (e.g., mines, fires, watershed runoff) are based on results of the analysis reported in the Alamo Lake Mercury TMDL – Source Assessment and Model Development Report, January, 2006 (Tetra Tech, Inc.).

Further study is recommended to provide additional information for assessment of mining loads and background loads from runoff, atmospheric deposition, etc. Future monitoring of Alamo Lake and its watershed must include consideration of loading targets (LAs set at each of three USGS gages), source identification, source reduction, air deposition, and in-lake tracking of water column and fish tissue targets.

Lake management to control cycling of mercury can have additional impacts on the overall assimilative capacity of the lake, and hence require external load reductions to meet the TMDL. Assessment of the benefits received from alternative management scenarios for the lake requires further study. The Water Quality Analysis Simulation Program (WASP) model developed for the current study may be used to provide this assessment. Specifically recommended are additional sediment cores, flow-through modeling using a dynamic model, evaluation of maintaining consistent water level and dam release options including pump-back system to break stratification.

Additional considerations include: monitor Bill Williams River water quality, fish tissue, and sediment; conduct screening evaluation of mercury in sediment and fish tissue in Lower Lake Havasu and CAP if warranted.

#### PROPOSED ACTIONS FOR IMPLEMENTATION

- ADEQ will work with ACOE, USFWS, and AGFD to integrate continued monitoring and modeling objectives in the lake and watershed. ADEQ will ensure consistent use of field methods, lab methods and detection limits for water, sediment and tissue analysis, including the use of clean hands/dirty hands collection, and low level mercury detection. ADEQ will work with ACOE to obtain data necessary to run a dynamic reservoir model.
- ADEQ will work with AGFD and ASP to ensure Fish Advisory posting is prominent and updated per this TMDL and as needed to support any future changes in status. ADEQ will continue to coordinate with EPA and AGFD to collect fish tissue for mercury analysis on a biannual basis and to explore fish management strategies to minimize fish uptake of mercury.
- ADEQ will work with BLM to schedule and implement an intensive survey of abandoned mines in the Alamo Lake watershed to identify hot spots. ADEQ will assist when possible in field reconnaissance and soil testing. An Access and GIS database will be established to house mine survey data for future refined modeling.
- ADEQ will develop and implement a plan for conducting air deposition monitoring using a mobile Tekran unit for measurement of dry deposition. This instrument is being loaned to ADEQ by EPA Region 9 on a quarterly basis for use around the state. Initially, ADEQ proposes to station the unit at Alamo Lake for a minimum of two weeks during the summer and two weeks during the winter-spring.
- ADEQ will continue to work with stakeholders to identify mercury sources and to assist in funding removal or remedial efforts where possible. ADEQ will incorporate all follow-up TMDL efforts in a TMDL Implementation Plan by fall of 2006.

#### PUBLIC PARTICIPATION

Stakeholder and public participation was encouraged and received throughout the development of this TMDL. Numerous meetings have been held during this process using the established forum known as the Bill Williams Corridor Steering Committee. Aside from EPA and ADEQ, involved parties are: AGFD, ASP, BLM, USCOE, BOR, USGS, USFWS, Phelps Dodge Corp., and Northern Arizona University. The draft TMDL report was made available for a 30-day public comment period starting December 28th, 2005. Public notice of the availability of the draft document was made via a posting in a newspaper of general circulation, the Wickenburg daily paper; via e-mail notifications; via phone calls; and via web page postings. Two copies of the draft Alamo Lake TMDL were made available at the Wickenburg Public Library. The draft Alamo Lake TMDL was presented in a public meeting in Wickenburg, AZ, on January 11, 2006. Only one set of comments was received, from the US Fish and Wildlife Service, during the 30-day public notice period.

COMMENT (quoted in significant part):

*“A nesting pair of bald eagles has occupied a territory at Lake Alamo since 1982. The female bald eagle at Lake Alamo holds the nation’s longevity record. You have calculated targets for human health using fishes from different trophic levels because humans consume fish caught at Lake Alamo. The calculation for a wildlife target for bald eagles is similar to that of humans. We recommend using the Cache Creek, Bear Creek, and Harley Gulch TMDL for Mercury (RWQCB, 2004) as guidance in your calculation. Per our conversation on January 26, 2006, if you have enough data to calculate a methylmercury target for bald eagles, please share the results with us and add it to the Final Lake Alamo Mercury TMDL. . .”*

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RESPONSE:

ADEQ agreed to calculate an eagle target using the suggested methodology and based on data provided by AGFD for eagles in Arizona. The resulting target of 0.21 mg/kg was shared with USFWS and has been incorporated in the Alamo Lake TMDL as the primary fish tissue target.

This draft will now be submitted to the *Arizona Administrative Register* and a 45-day public review period will follow the notice. After completion of the 45-day review period, this report will be submitted to the EPA for final approval.

**4. Name and address of agency personnel with whom persons may communicate:**

Name: Susan T. Fitch, Lakes Program Coordinator  
Address: Arizona Department of Environmental Quality  
1110 W. Washington St.  
Phoenix, AZ 85007  
Telephone: (602) 771-4541 (in Arizona: (800) 234-5677; ask for seven-digit extension)  
E-mail: fitch.susan@azdeq.gov  
Fax: (602) 771-4528

Copies of the revised draft TMDL may be obtained from the Department by contacting the numbers in this item. The draft TMDL may also be downloaded from the Department's web site at <http://www.azdeq.gov/envirom/water/assessment/status.html>

**5. The time during which the agency will accept written comments and the time and place where oral comments may be made:**

There is no public comment period associated with this Notice; the Department previously provided an opportunity for comment on the proposed TMDLs.