Arkansas's Final Assessment Methodology for the Preparation of the 2008 Integrated Water Quality Monitoring and Assessment Report (305(b) Report) and the 2008 List of Impaired Waterbodies (303(d) List)

This assessment methodology considers EPA's most current 305(b) reporting and 303(d) listing requirements and guidance. The criteria within this assessment methodology are utilized to make attainment decisions of the designated uses of a given waterbody or waterbody segment. Monitoring data will be assessed based upon the frequency, duration, and/or magnitude of water quality standard exceedances which may result in an impairment of a use. A one-time exceedance of water quality criteria due to anthropogenic disruptions may or may not cause a water quality impact, but allows the pursuit of enforcement actions.

The following assessment methodology will be used to determine waterbody use impairment from long-term and/or frequently occurring exceedances of the water quality criteria. In addition, short term, acute impacts can be identified by certain parameters.

DATA BASE

The primary data base for the 2008 Integrated Water Quality Monitoring and Assessment Report is from the ADEQ (Arkansas Department of Environmental Quality) Ambient and Roving Water Quality Monitoring Networks. The networks include the AWQMN (Ambient Water Quality Monitoring Network) stations that are sampled monthly and the RWQMN (Roving Water Quality Monitoring Network) stations that are sampled bi-monthly. The RWQMN Stations are divided into five groups geographically and are sampled for two years on a rotating schedule. Additional data, including but not limited to special projects, developed by ADEQ will be evaluated and used if the sampling frequency and duration represent actual annual ambient conditions. Data that represents actual annual ambient conditions is data collected on a random schedule and represents the various hydrological and climatological conditions that may occur on a yearly basis. The period of record from which most evaluations will be made for all the data used will be from July1, 2002 through June 30, 2007. Metals and ammonia nitrogen toxicity evaluations will be based on a period of record from July 1, 2004 to June 30, 2007.

Pursuant to 40 CFR §130.7(b)(5), ADEQ will assemble and evaluate all existing and readily available water quality data and information. The assembled and evaluated water quality-related data shall be consistent with the requirements of 40 CFR §130.7(b)(5)(i-iv).

Agencies that routinely collect water quality data are solicited for data to aid ADEQ in its evaluation of the uses of the States waters. All data submitted to ADEQ will be considered. However, the data must represent actual annual ambient conditions, as described above, to be utilized in use attainment evaluations. All data used must be collected and analyzed under a quality-assurance/quality-control protocol equivalent to, or more stringent than that of ADEQ or the USGS. The data must also be analyzed pursuant to the rules outlined in the State Environmental Laboratory Certification Program Act (Act 876 of 1985 as amended). The period of record from which most evaluations will be made using data from outside sources will be the same as described above.

ASSESSMENT

ADEQ must take into consideration the possibility of naturally occurring disruptions that may cause exceedances of a standard, but which should not result in the impairment of a designated use. Exceedances resulting from *Naturally Occurring Excursions* (NOE), or determined to be *Natural Background* conditions, as defined in Reg. 2.106, will not be assessed as impaired, provided supporting rationale is included.

Data collection generally follows a monthly or bimonthly sampling regime, thus producing 24 to 60 data points during a five-year period. Attainment decisions will be based on the criteria listed with this assessment methodology from the samples collected from the AWQMN or RWQMN. In addition, other data will be used to make use attainment decisions if the data meets QA/QC requirements and the requirements sent forth by this assessment methodology. The data will be evaluated on a case by case basis considering such things as period of record, number of samples, and seasonality in relationship to designated uses.

For the assessment of waterbodies where no new data has been generated since the previous assessment, the previous assessment decisions will be carried forward. However, if a significant change in the water quality regulations or the assessment methodology has occurred since the previous assessment, and those changes would affect the previous assessment decisions, then the waterbody will be re-assessed, provided an adequate data base exists within the period of record to make a scientifically defensible assessment decision.

The percent exceedance shown in the Assessment Criteria tables are calculated using the total number of samples collected. The number of data points exceeding the criteria which are necessary for an assessment decision will be calculated and rounded up to the nearest whole number; e.g. 25% of 38 data points = 9.5, therefore ten (10) exceedances equal 25%.

An evaluated assessment of non-attainment can be made for contiguous stream segments to monitored waters if there is reason to believe that the segments are similar with respect to the potential cause and magnitude of impairment. However, an evaluation of non-attainment of a designated use can not be made for contiguous stream segments to monitored waters when the source or the origin of the source of the impairment is unknown, and/or when the magnitude or frequency of the impairment is such that downstream segments may not be affected. In such cases, the contiguous stream segments will remain unassessed.

An evaluated assessment of attainment of designated uses, in the absence of data, can be made for contiguous stream segments to monitored waters if there is reason to believe that the segments are similar with respect to the watershed characteristics and watershed conditions. Otherwise, the contiguous stream segments will remain unassessed.

For lakes and reservoirs, assessments will be made from long-term trend data, collected initially in 1989 and continued on a five-year cycle, or seasonally distributed data. Seasonally distributed data is defined as data that has been collected to analyze water quality variations during different annual lake stages, including fully mixed, and partial and complete stratification.

Narrative Criteria

Waters will be assessed as "non-support" when violation of any narrative water quality standard has been verified by ADEQ. Waters will be assessed as "non-support" if any associated numeric standard of a narrative criterion is violated pursuant to this assessment methodology.

Numeric Criteria

All waters of the state with qualifying data will be assessed as either "support" or "non-support" based on the assessment criteria contained within this document.

LISTING OF WATERBODIES

The States' waterbodies are assessed based mainly on the RF3 stream reach classification. However, some stream reaches from the National Hydrological Dataset (NHD) are used to supplement the RF3 database coverage. Individual stream reaches that are assessed as not attaining their respective designated use(s) will be included on the 303(d) list. These reaches will be categorized based on the confidence level, quality assurance, quantity of the data used to make the assessment, and the following EPA derived guidance.

Listing Categories

Arkansas's 2008 List of Water Quality Limited Waterbodies has been formatted to reflect the most current guidance issued by the Environmental Protection Agency (EPA). As part of that guidance, EPA suggests placing waterbody segments into the five main categories. Waterbodies in Category 5 are placed in subcategories established by ADEQ for planning purposes.

1 = Attaining all designated uses;
2 = Attaining some designated uses, but there is insufficient data to determine if other uses are being attained;
3 = Insufficient data to determine if any designated use is attained;
4 = Impaired for one or more designated uses but does not require the development of a TMDL because:
   a. A TMDL has been completed for the listed parameter(s);
5 = The waterbody may be impaired, or one or more designated uses may not be attained. Waterbodies in Category 5 are placed in one of the following subcategories:
   a. Truly impaired; develop a TMDL or other corrective action(s) for the listed parameter;
   b. Waters currently not attaining standards, but may be de-listed with future revisions to Regulation No. 2, the state water quality standards;
   c. Waters in which the data is questionable because of QA/QC procedures and which require confirmation before a TMDL is scheduled;
   d. Waters which need data verification to confirm use impairment (additional sampling, biological assessment) before a TMDL is scheduled;
   e. Waters which are impaired by point source discharges and future permits restrictions are expected to correct the problem;
   f. Waters that currently do not meet an applicable water quality standard, but the impairment is not caused by a pollutant.

Designated Uses

The following parameters are most often associated with impacts of designated uses:

Designated Use	Parameters
Aquatic Life Use	D.O., pH, temp., turbidity/TSS, toxics, ammonia or any non toxic compound which alters the aquatic life community structure beyond that explained in Reg. 2.405.
Domestic Water Supply	Compounds which are not easily removed by drinking water treatment facilities; compounds with established secondary MCL's, e.g., Cl, SO_4, TDS, NO_3
Primary and Secondary Contact	*Escherichia coli*, fecal coliform
Agriculture or Industrial Water Supply	Compounds which interfere with industrial uses such as cooling water or the water used in certain manufacturing processes; or waters unsuitable for livestock watering or crop irrigation; most often includes Cl, SO_4, TDS

Antidegradation

In compliance with the antidegradation policy, a Tier 3 waterbody (e.g. Extraordinary Resource Waters, Ecologically Sensitive Waters, Natural and Scenic Waterways) will be listed as "non-support" if the water quality that existed at the time of designation has declined. For all other waters (Tier 1 and Tier 2) the listing requirements discussed above will apply.

ASSESSMENT CRITERIA

Following are ecoregion or stream segment specific assessment criteria which were used to list all assessed waterbodies as either supporting or not supporting the designated uses. These assessment criteria were developed using Arkansas's Water Quality Standards and, in part, from EPA's guidance for determining support or non-support of a waterbody.

Key to the footnotes in the assessment criteria tables is as follows:

1 - Except for site specific standards approved in water quality standards
2 - Criteria based on 90th percentile of ecoregion values
3 - Refers to the number of data points instead of a percentage (i.e. greater than one value exceeding criteria = non-support).

A waterbody will be assessed as "non-support" if any of its designated uses are determined to be impaired by a water quality parameter which exceeds the frequency as outlined in the following assessment criteria tables:

GENERAL STANDARDS

ASSESSMENT CRITERIA FOR OZARK HIGHLANDS ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	29 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	6	2	< =10%	< =10%	< =10%	< =10%
10-100 MI	6	5	< =10%	< =10%	< =10%	< =10%
> 100 MI	6	6	< =10%	< =10%	< =10%	< =10%
Trout Waters	6	6	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	10 NTU		< = 25%		>25%	
Storm Flow[2]	17 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR BOSTON MOUNTAINS ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	31 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	6	2	< =10%	< =10%	< =10%	< =10%
> 10 MI	6	6	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	10 NTU		< = 25%		>25%	
Storm Flow[2]	19 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR ARKANSAS RIVER VALLEY ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	31 C		< =10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	< =10%	< =10%
10-150 MI	5	3	< =10%	< =10%	< =10%	< =10%
151-400 MI	5	4	< =10%	< =10%	< =10%	< =10%
>400 MI	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	40 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR OUACHITA MOUNTAINS ECOREGION STREAMS

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	6	2	< =10%	< =10%	< =10%	< =10%
>10 MI	6	6	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	10 NTU		< = 25%		>25%	
Storm Flow[2]	18 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR GULF COASTAL ECOREGION (typical streams)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	< =10%	< =10%
10-500 MI	5	3	< =10%	< =10%	< =10%	< =10%
>500 MI	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	32 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR GULF COASTAL ECOREGION (springwater influenced)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERSHEDS	6	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	32 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR DELTA ECOREGION (least altered)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	30 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	< =10%	< =10%
10-100 MI	5	3	< =10%	< =10%	< =10%	< =10%
>100 MI	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	45 NTU		< = 25%		>25%	
Storm Flow[2]	84 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR DELTA ECOREGION (channel-altered)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< =10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
<10 MI	5	2	< =10%	< =10%	< =10%	< =10%
10-100 MI	5	3	< =10%	< =10%	< =10%	< =10%
>100 MI	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
TURBIDITY						
Primary Values	75 NTU		< = 25%		>25%	
Storm Flow[2]	250 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR WHITE RIVER (MAIN STEM)

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]						
DAM #1 TO MOUTH	32 C		< =10%		>10%	
OZARK HIGHLANDS	29 C		< = 10%		>10%	
TROUT WATERS	20 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
DELTA	5	5	< =10%	< =10%	< =10%	< =10%
OZARK HIGHLANDS	6	6	< =10%	< =10%	< =10%	< =10%
TROUT WATERS	6	6	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
Mouth to Dam #3	20/60/430		< =10%		>10%	
DAM #3 TO MO. LINE[1]	20/20/180		< =10%		>10%	
MO. LINE TO HEADWATERS[1]	20/20/160		< =10%		>10%	
TURBIDITY						
Primary Values Delta	45 NTU		< = 25%		>25%	
Storm Flow Delta[2]	84 NTU		< = 20%		>20%	
Primary Ozark Highlands	10 NTU		< = 25%		>25%	
Storm Flow Ozark Highlands[2]	17 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR ST. FRANCIS RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
MOUTH TO 36^0 N. LAT.[1]	10/30/330		< =10%		>10%	
36^0 N. LAT. TO 36^0 30'N LAT.[1]	10/20/180		< =10%		>10%	
TURBIDITY						
Primary Values	75 NTU		< = 25%		>25%	
Storm Flow[2]	100 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR THE ARKANSAS RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
MOUTH TO L&D #7[1]	250/100/500		< =10%		>10%	
L&D #7 TO L&D #10[1]	250/100/500		< =10%		>10%	
L&D #10 TO OK LINE[1]	250/120/500		< =10%		>10%	
TURBIDITY						
Primary Values	50 NTU		< = 25%		>25%	
Storm Flow[2]	52 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR THE OUACHITA RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]						
L. MISSOURI TO S.LINE	32 C		< = 10%		>10%	
ABOVE L. MISSOURI	30 C		< =10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
LA LINE TO CAMDEN[1]	160/40/350		< =10%		>10%	
CAMDEN TO CARPENTER DAM[1]	50/40/150		< =10%		>10%	
CARPENTER DAM TO HEADWATERS[1]	10/10/100		< =10%		>10%	
TURBIDITY						
Primary Values	21 NTU		< = 25%		>25%	
Storm Flow[2]	32 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR THE RED RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
OK LINE TO CONFLUENCE WITH LITTLE RIVER[1]	250/200/850		< =10%		>10%	
LITTLE RIVER TO LA LINE[1]	250/200/500		< =10%		>10%	
TURBIDITY						
Primary Values	50 NTU		< = 25%		>25%	
Storm Flow[2]	150 NTU		< = 20%		>20%	

ASSESSMENT CRITERIA FOR THE MISSISSIPPI RIVER

PARAMETER	STANDARD		SUPPORT		NON-SUPPORT	
			DATA POINTS EXCEEDING CRITERIA			
TEMPERATURE[1]	32 C		< = 10%		>10%	
DISSOLVED OXYGEN[1]	Primary	Critical	Primary	Critical	Primary	Critical
ALL WATERS	5	5	< =10%	< =10%	< =10%	< =10%
pH	6 to 9 standard pH units		< =10%		>10%	
$CL/SO_4/TDS$[1]						
LA LINE TO AR RIVER[1]	60/150/425		< =10%		>10%	
AR RIVER TO MO LINE[1]	60/175/450		< =10%		>10%	
TURBIDITY						
Primary Values	50 NTU		< = 25%		>25%	
Storm Flow[2]	75 NTU		< = 20%		>20%	

SPECIFIC STANDARDS

Domestic Water Supply

For assessment of ambient waters, the domestic water supply designated use will be evaluated using nitrate nitrogen, chloride, sulfate, and total dissolved solids in accordance with the Federal Safe Drinking Water Act. If greater than 10% of the total samples for the period of record exceed the applicable criteria, the waterbody will be listed as impaired.

Statewide Drinking Water Assessment Criteria

PARAMETER	STANDARD	SUPPORT	NON-SUPPORT
NO_3-N (D.W.)	10 mg/L	< =10%	>10%
$CL/SO_4/TDS$[1]	250/250/500	< =10%	>10%

Reg. 2.503 - Turbidity

Turbidity, Reg. 2.503, will be evaluated for both base flow (primary values) and storm-flow (storm-flow values) conditions. If a waterbody is not meeting either of these conditions, it will be listed as not supporting turbidity water quality criteria.

Primary values represent the critical season when rainfall is infrequent and is applied to samples collected between June 1 and October 31. If four or more samples, or more than 25% of the total samples, whichever is greater, collected between June 1 and October 31 for the period of record exceed the primary values criterion, the waterbody will be listed as impaired.

Storm-flow assessment takes into account samples collected throughout the year. If more than 20% of the total samples collected from the AWQMN sites, not to be less than 24, exceed the Storm-Flow values, the waterbody will be evaluated as being impaired for turbidity. For data collected from sites other than the AWQMN, if five or more samples, or more that 20% of the total samples, whichever is greater, exceed the Storm-Flow criterion, the waterbody will be listed as impaired.

Reg. 2.507 - Pathogens

For assessment of ambient waters, primary and secondary contact recreation will be evaluated using *Escherichia coli* and fecal coliform bacteria criteria as outlined in Reg. 2.507. The period of record for the data will be from July 1, 2002 to June 30, 2007. For bacteria, a minimum of eight (8) samples will be required to make an evaluation of non-attainment. However, a minimum of six (6) samples, all of which must meet the criteria, can be used to make an evaluation of attainment.

The geometric mean will be calculated on a minimum of five (5) samples equally spaced over a 30-day period during either the primary contact recreation season and/or the secondary contact recreation season and should not exceed the criteria set forth in Reg 2.507.

In either case, if either the single sample criterion or the geometric mean is exceeded for the period of record, the waterbody will be listed as impaired. Data sets of less than those described above will be evaluated if they represent actual annual ambient conditions.

Statewide Bacteria Assessment Criteria

Escherichia coli		STANDARD	SUPPORT	NON-SUPPORT
PRIM. CONTACT	Extraordinary Resource Waters Lakes, Reservoirs	298 col/100 ml (May-Sept)	< = 25%	>25%
		GM 126 col/100 ml	< = standard	> standard
	All other waters	410 col/100 ml (May-Sept)	< = 25%	>25%
SEC. CONTACT	Extraordinary Resource Waters Lakes, Reservoirs	1490 col/100 ml(anytime)	< = 25%	>25%
		GM 630 col/100 ml	< = standard	> standard
	All other waters	2050 col/100 ml(anytime)	< = 25%	>25%
Fecal Coliform		STANDARD	SUPPORT	NON-SUPPORT
PRIMARY CONTACT All Waters including ERW, ESW, NSW, Lakes, and Reservoirs		400 col/100 ml (May-Sept)	< = 25%	>25%
		GM 200 col/100 ml	< = standard	> standard
SECONDARY CONTACT All Waters including ERW, ESW, NSW, Lakes, and Reservoirs		2000 col/100 ml(anytime)	< = 25%	>25%
		GM 1000 col/100 ml	< = standard	> standard

Reg. 2.508 - Metals

In accordance with Reg. 2.508, metals toxicity will be evaluated based on instream hardness values at the time of sample collection. If the ambient hardness value is less than 25 mg/L, then a hardness value of 25 mg/L will be used to calculate metals toxicity. If more than one violation of the calculated toxicity numeric occurs during a 3-year period, the waterbody will be evaluated as being impaired for the metal assessed.

Statewide Metals Assessment Criteria

	Acute[3]	Chronic[3]
Support	< =1	< =1
Non-Support	>1	>1

Reg. 2.511 - Minerals

Mineral quality will be evaluated as follows: assessments for waterbodies with site specific criteria are made according to the specific values listed in Reg. 2.511. For those waterbodies without site specific criteria, and those stream segments which receive waste water effluent, the criteria of 250 mg/l of chlorides, 250 mg/l of sulfates, and 500 mg/l of total dissolved solids in Reg. 2.511 will apply. In either case, if greater than 10% of the total samples for the period of record exceed the applicable criteria, the waterbody will be included on the 303(d) list as being impaired for the mineral assessed.

Statewide Minerals Assessment Criteria

Parameter	Standard	Support	Non-Support
Site Specific Standards	See Reg. 2.511	< =10%	>10%
$CL/SO_4/TDS$[1]	250/250/500	< =10%	>10%

The ecoregion values described in Reg. 2.511 are used to determine whether there is a 'significant modification of the water quality.' These values are not intended to be used to indicate an impairment of a designated use. Any discharge which results in instream chlorides, sulfates, and or total dissolved solids concentrations greater than the calculated ecoregion reference stream values list below is considered to be a significant modification of the water quality and should be considered as candidates for a modification in accordance with Reg. 2.306.

CALCULATED ECOREGION REFERENCE STREAM VALUES (mg/l)

Ecoregion	Chlorides	Sulfates	TDS
Ozark Highlands	17.3	22.7	250
Boston Mountains	17.3	15	95.3
Arkansas River Valley	15	17.3	112.3

Ouachita Mountains	15	20	142
Gulf Coastal Plains	18.7	41.3	138
Delta	48	37.3	411.3

Reg. 2.512 - Ammonia

Acute total ammonia nitrogen will be evaluated using Reg. 2.512(A) based on instream pH at the time of sample collection. If more than one violation of the calculated toxicity numeric occurs during a 3-year period, the waterbody will be evaluated as being impaired.

Chronic total ammonia nitrogen will be evaluated using Reg. 2.512(B) based on instream temperature and pH at the time of sample collection. If more than 10% of the total samples exceed the criteria in Reg. 2.512(B) the segment will be assessed as not supporting aquatic life.

For Reg. 2.512(C), the highest four day average within a 30-day period should not exceed 2.5 times the chronic values listed in Reg. 2.512(B). If more than one violation of the calculated toxicity numeric occurs during a 3-year period, the waterbody will be evaluated as being impaired.

Statewide Total Ammonia Nitrogen Assessment Criteria

	ACUTE[3]	CHRONIC	4-DAY AVERAGE[3]
Support	< =1 in 3 years	< =10%	< =1 in 3 years
Non-Support	>1 in 3 years	>10%	>1 in 3 years

Fish Consumption

Waters will be listed as “non-support” for fish consumption if a primary segment of the fish community (e.g., all predators or all Largemouth bass) is recommended for non-consumption by any user group (e.g., general population or high risk groups). However, if a consumption restriction is recommended, e.g., no more than two meals per month or no consumption of fish over 15-inches, these waters will not be listed as “non-support”.

Statewide Fish Consumption Assessment Criteria

Support	No restriction or limited consumption
Non-Support	No consumption for any user group