

Interim Strategy for Minerals Permit Limits January 15, 2014

Minerals include chlorides, sulfates and total dissolved solids (“TDS”). Arkansas has adopted water quality criteria for minerals to protect domestic water supplies in Regulation 2.¹ Arkansas’ minerals criteria for domestic water supplies are the same as the secondary drinking water standards adopted by EPA under the federal Safe Drinking Water Act (250 mg/L for chlorides, 250 mg/L for sulfates and 500 mg/L for TDS).

Currently, Arkansas has issued **33 permits** with minerals limits. Most, if not all, of these permits contain effluent limitations (also known as “permit limits”) for minerals because site-specific minerals criteria were adopted to address the permitted discharge.² These site-specific criteria usually are adopted because in-stream water quality exceeds the secondary drinking water standards, the receiving stream is impaired due to minerals, or a total maximum daily load (“TMDL”) has been developed to address water quality impairment. If limits are going to be, or are, included in a permit, the regulated entity usually seeks to develop site-specific criteria that will establish in-stream minerals concentrations that will allow them to continue operating without having to install costly control measures. However, in order to develop such site-specific criteria, the regulated entity must first demonstrate that existing uses will be maintained and protected once the new criteria are adopted. This process can include conducting a two-year study of water quality and aquatic life at locations upstream and downstream of the permit holder’s discharge.

Regulation 2 Triennial Review

ADEQ proposes to make a number of changes to Regulation 2 to address minerals in the State’s water quality standards. The proposed changes include:

- Extending the compliance period for meeting new permit limits for more than three years for permittees completing site-specific criteria development (Reg. 2.104);
- Revising the critical flow definition (Reg. 2.106);
- Clarifying that, unless otherwise indicated, the specific standards set out in Chapter 5 apply to all waters at all times (Reg. 2.501);
- Retaining the single asterisk in Reg. 2.511(A). This asterisk specifies which site-specific criteria were developed using 4 cfs. The asterisk and the critical flow definition will allow facilities that currently discharge to streams with an asterisk to continue using 4 cfs as the critical flow in calculating their permit limits for minerals; and
- Clarifying that ecoregion values are used to identify when site-specific criteria development should be considered and to make clear that ecoregion values are not used to evaluate attainment of the water quality standards for assessment purposes (Reg. 2.511(B)).

¹ Reg. 2.511(C).

² See Reg. 2.511(A).

Other Measures

In addition to making these proposed changes to Regulation 2, ADEQ also has revised the 2014 Assessment Methodology to allow an exceedance of site-specific minerals criteria in 25% of the samples, rather than in 10% of the samples as previously provided. Finally, ADEQ is proceeding with an initial study to be funded by EPA to review existing mineral criteria and values and propose changes to the mineral provisions or to the process for developing site-specific criteria at concentrations below the secondary drinking water standards. Frequently, site-specific criteria are developed to establish allowable in-stream concentrations of minerals that are less than secondary drinking water standards. To facilitate these changes to water quality standards, ADEQ hopes that an expedited process can be developed that also ensures a stream's existing uses will be protected and maintained. It is not often necessary to develop site-specific minerals criteria that exceed the secondary drinking water standards. When that does occur, then the detailed study currently provided for in Reg. 2.306 must be followed to ensure that all existing uses will be protected and maintained where minerals concentrations greater than secondary drinking water standards are sought for a receiving waterbody.

Critical Flow Definition

The most controversial proposal has been the change in the definition of critical flow for minerals. Critical flow is the flow volume used as background dilution flow in calculating permit limits. The definition is being revised in this Triennial Review as follows:

Critical flows: The flow volume used as background dilution flows in calculating concentrations of pollutants from permitted discharges. These flows may be adjusted for mixing zones. The following critical flows are applicable:

For a seasonal fishery aquatic life - 1 cubic foot per second (cfs) minus the design flow of any point source discharge (may not be less than zero);

For human health criteria - harmonic mean flow or long term average flow;

~~For minerals criteria - harmonic mean flow or 4 cfs, except in those waters listed in Reg. 2.511. Those waters in Reg. 2.511 which are noted with an asterisk will have a critical flow of 4 cfs. (Also see minerals implementation procedure in CPP), except as follows:~~

- Reg. 2.511(A) Site Specific Mineral Criteria listed with an asterisk- 4 cubic feet per second.
- Reg. 2.511 (C) Domestic Water Supply: Q7-10; and

~~For all others metals and conventional pollutants - the critical flow will be Q7-10.~~

The *existing* critical flow definition for minerals **uses harmonic mean flow** for calculating permit limits and 4 cfs. ADEQ views harmonic mean flow as an appropriate measure of long term flow data. Four cfs has been used in the past as a default value for small watershed streams where sufficient data was lacking to establish harmonic mean flow. This default value was derived in the 1980s from a review of the limited flow data available from small watersheds

within each ecoregion, and, in the 1990s, based on this limited data set, a statewide median flow of 4 cfs was selected to be used as a “critical flow” in place of harmonic mean flows where insufficient data existed to establish such flows.³

In this Triennial Review, ADEQ proposes to keep the definition of “critical flow” for determining mineral permit limits as harmonic mean flow and to allow 4 cfs to continue to be used only for calculating permit limits by those facilities that used 4 cfs to develop site-specific criteria for those designated stream segments indicated with an asterisk in Reg. 2.511(A). This allows existing facilities that relied on 4 cfs in the completion of site specific criteria development to continue using 4 cfs in calculating permit limits.

It is important to note that ADEQ and the public now have access to USGS’ StreamStats, which can provide mean flow and 7Q10 for streams *based on actual stream gauge data*. Using this data, a harmonic mean flow can be calculated for any stream in Arkansas. Consequently, for permit holders who will require permit limits for minerals in the future, the default value of 4 cfs value for small watershed streams is no longer needed or appropriate. The changes to the critical flow definition for minerals include removing 4 cfs as a default value for establishing permit limits (except for those facilities that discharge into stream segments marked with an asterisk). This change is included in this Triennial Review because a more appropriate critical flow is readily available for all waters in Arkansas. Harmonic mean flow has been and continues to be an appropriate measure of long term flow data. Nonetheless, removing 4 cfs from the critical flow definition raises concerns for existing permit holders that do not currently have permit limits for minerals. In order to address those concerns, if requested, ADEQ will administratively continue any existing permits which require new numeric effluent limitations to be added for minerals upon permit renewal. This temporary measure will be followed by ADEQ until the study of Statewide mineral criteria or values is completed and, as appropriate, any proposed changes to the mineral provisions or the process for establishing revised or new site-specific criteria have been adopted. The only exception to this strategy will apply to the fourteen permits submitted to EPA in accordance with the requirements of Act 954. EPA objected to each of those permits, and ADEQ must address EPA’s objections to avoid the permits being issued by EPA. Some of these permits may require new numeric effluent limits for minerals, which will have to be added to the permit before an alternate process for addressing minerals can be put into place. In addition and as appropriate ADEQ will issue permits which may otherwise require minerals limitations with 5 years of monitoring and reporting requirements only.

Conclusion

ADEQ will continue to work with EPA on completing the study to evaluate existing mineral criteria and values and propose changes to the criteria or to the process for developing site-specific criteria for mineral concentrations at or below the secondary drinking water standards or domestic water supply criteria. ADEQ also will provide periodic updates (at least quarterly) to the legislative committees and the public on the progress of the study and any revisions to minerals standards, assessment, or permitting. ADEQ also, upon request, will administratively continue any existing permits which require new numeric effluent limits to be added for

³ In addition to being used to calculate permit limits, 4 cfs also has been used in the past to develop site-specific mineral criteria for small streams. For a number of reasons, the Department does not believe that 4 cfs can continue to be used for developing site-specific criteria.

minerals. Such permits will be administratively continued until the study of Statewide mineral criteria and values is completed and, as appropriate, any proposed changes to the mineral provisions or the process for establishing revised or new site-specific criteria have been adopted.

List of Revisions to Draft Reg. No. 2 Post Public Comment

Reg. 2.104, Policy for Compliance (page 1-2)

The second sentence was revised to state “Consequently, compliance schedules may be included in National Pollutant Discharge Elimination System (NPDES) permits at the time of renewal or permit modification initiated by the Department to require compliance with new water quality standards.”

Reg. 2.106, Definitions, Critical flows (page 1-3)

Revise the definition as follows:

Critical flows: The flow volume used as background dilution flows in calculating concentrations of pollutants from permitted discharges. These flows may be adjusted for mixing zones. The following critical flows are applicable:

For a seasonal fishery aquatic life - 1 cubic foot per second (cfs) minus the design flow of any point source discharge (may not be less than zero);

For human health criteria - harmonic mean flow or long term average flow;

For minerals criteria-- harmonic mean flow or 4 cfs, except in those waters listed in Reg. 2.511. Those waters in Reg. 2.511 which are noted with an asterisk will have a critical flow of 4 cfs. (Also see minerals implementation procedure in CPP), except as follows:

- o Reg. 2.511(A) Site Specific Mineral Criteria listed with an asterisk- 4 cubic feet per second.
- o Reg. 2.511 (C) Domestic Water Supply: Q7-10; and

For all others metals and conventional pollutants - the critical flow will be Q7-10.

Reg. 2.106, Definitions, Harmonic Mean Flow (page 1-5)

The previously approved definition from 2011 was retained. “**Harmonic mean flow:** The reciprocal of the mean of the reciprocals of daily flow measurements.”

Reg. 2.106, Definitions, Nonpoint source (page 1-6)

To clarify, this definition was revised as follows: “**Nonpoint source:** A contributing factor to water pollution that is not confined to an end-of-the-pipe discharge, i.e., stormwater runoff not regulated under Clean Water Act § 402(p)(1), 33 U.S.C. § 1342(p)(1), agricultural or silvicultural runoff, irrigation return flows, etc.”

Reg. 2.106, Definitions, Primary Season Critical Flow (page 1-7)

This definition was deleted. The phrase “primary season critical flow” is not used anywhere in the regulation outside of this definition, therefore it is unnecessary.

Reg. 2.106, Definitions, State of Arkansas Continuing Planning Process (page 1-7)

The phrase “The CPP is not a regulation.” was retained at the end of the definition.

Reg. 2.404, Mixing Zones (page 4-1)

The following proposed revisions were removed:

,pH except as specified in 40 C.F.R. § 133.102(c),

Careful consideration will be given to the appropriateness of a mixing zone where a substance discharged is bioaccumulative, persistent, carcinogenic, mutagenic, or teratogenic.

A mixing zone shall not apply to any public or private domestic water supply intake or public water supply well.”

The phrase “A mixing zone shall not include any domestic water supply intake.” was retained.

The first sentence is revised as: “Where Mmixing zones are allowed for all parameters not specifically excluded in Reg. 2.404 and the effects of wastes on the receiving stream shall be determined after the wastes have been thoroughly mixed with the mixing zone volume.”

Reg. 2.502, Temperature. (page 5-1)

The last sentence of the first paragraph was revised to read “The following standards are applicable:”

Reg. 2.503, Turbidity, (page 5-2)

The paragraph was revised to state “There shall be no distinctly visible increase in turbidity of receiving waters attributable to discharges or instream activities. The values below should not be exceeded during base flow (June to October) in more than 20% of samples. The values below should not be exceeded during all flows in more than 25% of samples taken in not less than 24 monthly samples.”

Reg. 2.504, pH, (page 5-2)

The proposed sentence “No mixing zones are allowed for pH (except as specified in 40 CFR § 133.201(c)).” was stricken from the regulation.

Reg. 2.507, Bacteria (page 5-6)

The currently approved statement was retained; “For assessment of ambient waters as impaired by bacteria, the below listed applicable values for *E. coli* shall not be exceeded in more than 25% of samples in no less than eight (8) samples taken during the primary contact season or during the secondary contact season.”

Reg. 2.507, Bacteria (page 5-7)

The following footnotes were added to the IS and GM criteria as appropriate:

³For assessment of Individual Sample Criteria – at least eight (8) data points

⁴For calculation and assessment of Geometric Mean – calculated on a minimum of five (5) samples spaced evenly and within a thirty (30) -day period.

Reg. 2.508, Toxic Substances (page 5-7)

The currently approved statement was retained; “Toxic substances shall not be present in receiving waters, after mixing, in such quantities as to be toxic to human, animal, plant or aquatic

life or to interfere with the normal propagation, growth and survival of the indigenous aquatic biota.”

Reg. 2.509, Nutrients (page 5-10 & 5-11)

The phosphorus discharge limits were retained.

“All point source discharges into the watershed of waters officially listed on Arkansas’ impaired waterbody list (303d) with phosphorus as the major cause shall have monthly average discharge permit limits no greater than those listed below. Additionally, waters in nutrient surplus watersheds as determined by Act 1061 of 2003 Regular Session of the Arkansas 84th General Assembly and subsequently designated nutrient surplus watersheds may be included under this Reg. if point source discharges are shown to provide a significant phosphorus contribution to waters within the listed nutrient surplus watersheds.

<u>Facility Design Flow – mgd</u>	<u>Total Phosphorus discharge limit – mg/L</u>
= or > 15	Case by case
3 to <15	1.0
1 to <3	2.0
0.5 to <1.0	5.0
<0.5	Case by Case

For discharges from point sources which are greater than 15 mgd, reduction of phosphorus below 1 mg/L may be required based on the magnitude of the phosphorus load (mass) and the type of downstream waterbodies (e.g., reservoirs, Extraordinary Resource Waters). Additionally, any discharge limits listed above may be further reduced if it is determined that these values are causing impairments to special waters such as domestic water supplies, lakes or reservoirs or Extraordinary Resource Waters.”

Reg. 2.510, Oil and Grease (page 5-11)

The second to the last sentence of the paragraph was revised to state “Oil and grease shall be an average of no more than 10 mg/L or a maximum of no more than 15 mg/L.”

Reg. 2.511(A), Mineral Quality (page 5-13)

Remove the asterisks from the site specific criteria for Boggy Creek.

Boggy Creek - from the discharge for Clean Harbors El Dorado LLC to the confluence of Bayou de Loutre	631	63	1360
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Reg. 2.511(A), Mineral Quality (page 5-14)

Add asterisks from the site specific criteria for Dismukes Creek and Big Creek.

Dismukes Creek	26*	ER	157*
Big Creek from Dismukes to Bayou Dorcheat	20*	ER	200*

Reg. 2.511(A), Mineral Quality (page 5-11 to 5-15)

The table will be maintained as one table.

Reg. 2.511(A), Mineral Quality (page 5-12)

The proposed revision in the table regarding the Big Creek Ditch (Headwaters to unnamed trib) was deleted.

Reg. 2.511(A), Mineral Quality (page 5-13)

Bayou Bartholomew in the table was revised as follows:

Bayou Bartholomew	50 <u>30</u>	20 <u>30</u>	500 <u>220</u>
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Reg. 2.511(A), Mineral Quality (page 5-13)

The following criteria was retained and the † was added.

Unnamed trib A to Flat Creek from mouth of EDCC 001 ditch to confluence with Flat Creek	16*†	80*†	315*†
Confluence with unnamed trib A to Flat Creek	23*†	125*†	475*†

A footnote was added to state: “† Not applicable for Clean Water Act purposes until approved by EPA.”

Reg. 2.511(A), Mineral Quality (page 5-15)

The double asterisk was retained as previously stated “** - These limits shall apply to all tributaries of Bayou Meto and Bayou Two Prairie listed in Appendix A”. The single asterisk was retained as the following clarification. “* - developed using background flow of 4 cfs”.

Reg. 2.511(B), Mineral Quality (page 5-15)

The paragraph was revised to state:

“The following values were determined from Arkansas' least-disturbed ecoregion reference streams are considered to be the maximum naturally occurring levels. For waterbodies not listed above, any discharge which results in instream concentrations more than 1/3 higher than these values for chlorides (Cl⁻) and sulfates (SO₄⁼²) or more than 15 mg/4L, whichever is greater, is considered to be a significant modification of the water quality maximum naturally occurring values. These waterbodies should be considered as candidates for site specific criteria development in accordance with Regs. 2.306 and 2.308. Similarly, such modification exists site specific criteria development should be considered if the following TDS values are exceeded after being increased by the sum of the increases to Cl and SO₄. Such modifications criteria may be made developed only in accordance with Regs. 2.306 and 2.308. The values listed in the table below are not intended nor will these values be used by the Department to evaluate attainment of the water quality standards.”

Reg. 2.512 (B), Ammonia (page 5-16)

The heading will be revised to state “The monthly average concentration of total ammonia nitrogen shall not exceed those values shown as the chronic criterion in the following tables:”.

Appendix A

Proposed species additions to currently designated ESW streams have been stricken.

Appendix A, Ouachita Mountains

“southern hickorynut” was revised to “southern hickorynut” (page A-37)

The boxes with the numbers 6 and 7 were added to plate OM-2. (page A-43)

Appendix A, Gulf Coastal Plain

“winger mapleleaf” was revised to “winged mapleleaf” (page A-46)

“Loutre creek” was revised to “Loutre Creek” (page A-47)

The boxes with the numbers 52, 53, and 54 were added to plate GC-4. (page A-58)

(GC-2, #51) was added to the end of “Boggy Creek from the discharge from Clean Harbors El Dorado LCC downstream to the confluence of Bayou de Loutre”

Appendix A, Delta

“Total dissolved oxygen” was revised to “total dissolved solids”. (page A-63)

The boxes with the numbers 38, 39, and 40 were added to plate D-1. (page A-67)

Appendix C

Proposed list of “Scientific Names of Aquatic and Semi-Aquatic Life Forms Protected Under the Ecologically Sensitive Waterbody Designated Use” has been stricken.