

**Record of Decision
for EPA Action on
Arkansas' 2008 §303(d) List**

Administrative Records Cited

See Appendix VI for a listing of the documents used in the review of the Arkansas 2008 §303(d) List.

Time Line for the Arkansas 2008 §303(d) List

The statutory and regulatory requirements, and the Environmental Protection Agency's (EPA's) review of Arkansas' compliance with each requirement, are described in detail below.

1. January 4, 2008: EPA received letter from Steve Drown submitting ADEQ's draft 2008 §303(d) list submittal package for EPA's early review.
2. January 15, 2008: Held conference call with ADEQ to discuss the draft Arkansas 2008 §303(d) list.
3. February 1, 2008: EPA provided comments on the draft Arkansas 2008 §303(d) list.
4. February 7, 2008: ADEQ submitted a revised draft 2008 §303(d) list via email.
5. February 11, 2008: ADEQ issued a notice of public hearing, comment period for the 2008 §303(d) list. Comment period closes March 26, 2008.
6. March 21, 2008: EPA mailed and faxed a comment letter to Steve Drown of ADEQ regarding issues on the 2008 §303(d) list.
7. April 1, 2008: EPA received the Arkansas 2008 Integrated Report.
8. May 15, 2008: EPA received ADEQ's Responsiveness Summary to Public Comments received during the ADEQ public comment period.

Purpose

The purpose of this review document is to describe the rationale for EPA's partial approval and partial disapproval of Arkansas's 2008 §303(d) list. The following sections identify those key elements to be included in the list submittal based on the Clean Water Act (CWA) and EPA regulations (see 40 CFR §130.7). The EPA reviewed the methodology used by the State in developing the §303(d) list and Arkansas' description of the data and information it considered. EPA's review of Arkansas's §303(d) list is based on EPA's analysis of whether the State reasonably considered existing and readily available water quality-related data and information and identified all waters required to be listed.

Statutory and Regulatory Background**Identification of Water Quality Limited Segments (WQLS) for Inclusion on §303(d) List**

Section 303(d)(1) of the Act directs States to identify those waters within its jurisdiction for which effluent limitations required by Section 301(b)(1)(A) and (B) are not stringent enough to

implement any applicable water quality standard, and to establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters. The §303(d) listing requirement applies to waters impaired by point and/or nonpoint sources, pursuant to EPA's long-standing interpretation of §303(d).

EPA regulations provide that States do not need to list waters where the following controls are adequate to implement applicable standards: (1) technology-based effluent limitations required by the Act, (2) more stringent effluent limitations required by federal, State or local authority, and (3) other pollution control requirements required by State, local, or federal authority. See 40 CFR 130.7(b)(1).

Consideration of Existing and Readily Available Water Quality-Related Data and Information

In developing §303(d) lists, States are required to assemble and evaluate all existing and readily available water quality-related data and information, including, at a minimum, consideration of existing and readily available data and information about the following categories of waters: (1) waters identified as partially meeting or not meeting designated uses, or as threatened, in the State's most recent §305(b) report; (2) waters for which dilution calculations or predictive modeling indicate nonattainment of applicable standards; (3) waters for which water quality problems have been reported by governmental agencies, members of the public, or academic institutions; and (4) waters identified as impaired or threatened in any §319 nonpoint assessment submitted to EPA. See 40 CFR 130.7(b)(5). In addition to these minimum categories, States are required to consider any other data and information that is existing and readily available. EPA's 1991 Guidance for Water Quality-Based Decisions describes categories of water quality-related data and information that may be existing and readily available. See Guidance for Water Quality-Based Decisions: The TMDL Process, EPA Office of Water, 1991, Appendix C ("EPA's 1991 Guidance"). While States are required to evaluate all existing and readily available water quality-related data and information, States may decide to rely or not rely on particular data or information in determining whether to list particular waters.

In addition to requiring States to assemble and evaluate all existing and readily available water quality-related data and information, EPA regulations at 40 CFR 130.7(b)(6) requires States to include as part of their submission to EPA documentation to support decisions to rely or not rely on particular data and information and decisions to list or not list waters. Such documentation needs to include, at a minimum, the following information: (1) a description of the methodology used to develop the list; (2) a description of the data and information used to identify waters; and (3) any other reasonable information requested by EPA Region 6.

Priority Ranking

EPA regulations also codify and interpret the requirement in §303(d)(1)(A) of the Act that States establish a priority ranking for listed waters. The regulations at 40 CFR 130.7(b)(4) require the States to prioritize waters on their §303(d) lists for TMDL development, and also to identify those water quality limited segments (WQLSs) targeted for TMDL development in the next two years. In prioritizing and targeting waters, States must, at a minimum, take into account the severity of the pollution and the uses to be made of such waters. See §303(d)(1)(A). As long as these

factors are taken into account, the Act provides that States establish priorities. The States may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs, vulnerability of particular waters as aquatic habitats, recreational, economic, and aesthetic importance of particular waters, degree of public interest and support, and State or national policies and priorities. See 57 FR 33040, 33045 (July 24, 1992), and EPA's 1991 Guidance.

A Description of the State of Arkansas' Final Submission

EPA Region 6 received the 2008 Arkansas Clean Water Act §303(d) List on April 1, 2008. The Arkansas Department of Environmental Quality (ADEQ) submitted the final list along with supporting documentation that included the following:

- Arkansas "Water Quality Limited Waterbodies – §303(d) List – 2008", which includes the methodology used for selecting impaired waterbodies, the assessment criteria, and a listing of impaired rivers/streams and lakes/reservoirs.
- A partial water body specific justification for the non-listing of waters that, in some cases, did not provide the information required for EPA to support ADEQ's actions.

A responsiveness summary to the comments received from the public during the comment period concerning the impaired waters list was submitted on May 15, 2008.

Analysis of the State of Arkansas' Submission

Consideration of Existing and Readily Available Water Quality-Related Data and Information.

EPA has reviewed the State's submission and has concluded that the State developed its §303(d) list in partial compliance with §303(d) of the Act and 40 CFR 130.7. Because the EPA has determined that Arkansas's submission does not include all waters that meet §303(d) listing requirements, EPA is partially approving and partially disapproving Arkansas' list submission and proposing to add the additional waters and pollutants that meet the listing requirements to the final 2008 list. EPA's review is based on its analysis of whether the State reasonably considered existing and readily available water quality-related data and information and reasonably identified waters required to be listed. Based on EPA's review, seventy-three (73) water body pollutant pairs are proposed for addition to the Arkansas 2008 §303(d) list.

As suggested by recent EPA guidance, Arkansas chose to combine the 2008 §305(b) report and §303(d) list into a single report following EPA's listing guidance titled "Guidance for the 2002 Integrated Assessment and Reporting on the Quality of States' Waters" ("Integrated Report"). A single assessment methodology for the Integrated Report was used for both the 305(b) reporting and the 303(d) listing activities. The Integrated Report included five categories as established in EPA guidance. Category 5, which is the 2008 §303(d) list, was also included in the report. Category 5 is the portion of the Integrated Report on which EPA is taking action today.

EPA's review of Arkansas' waters consisted of applying the Arkansas Department of Environmental Quality's (ADEQ) 2008 assessment methodology to data (USGS or Arkansas's

ambient monitoring data) for the period of record from July 1, 2002 through June 30, 2007, in addition to reviewing other readily available data. The list was developed based primarily on the data available in the ADEQ ambient monitoring database. ADEQ provided an electronic copy of this data to EPA. ADEQ also posted the draft list on the ADEQ website.

Although EPA reviewed Arkansas' 2008 Assessment Methodology as part of our review of the listing submission, the EPA's partial approval of the State's listing decisions should not be construed as concurrence with or approval of the 2008 Assessment Methodology. EPA is not required to take action on the assessment methodology itself under 40 CFR 130.7. EPA's decision to partially approve and partially disapprove Arkansas' listing decisions is based on EPA's review of the data and information submitted concerning individual waters and the State's evaluations of those waters. While EPA considered the State's 2008 Assessment Methodology as part of its review, EPA's evaluation was intended to determine whether the State had identified all waters that meet federal listing requirements specified in §303(d) and 40 CFR 130.7.

The Arkansas 2008 Assessment Methodology describes a set of decision criteria that were flexibly applied. In general, waters were listed in cases where at least 12 samples were available and more than a certain percentage of samples exceeded the applicable water quality standards during the past five years. The applicable percent exceedances were provided in the ecoregion and stream specific assessment criteria tables of ADEQ's 2008 Assessment Methodology varied according to the parameter (i.e. turbidity, pathogens, etc.). EPA technical staff determined that the percent exceedance used in the assessment methodology is a reasonable approach that is described in the EPA 1997 Guidance document and is consistent with Arkansas's water quality standards.

EPA reviewed ADEQ's description of the data and information it considered and its methodology for identifying waters. For those waters being approved on the 2008 list, EPA concludes that the State properly assembled and evaluated all existing and readily available data and information, including data and information relating to the categories of waters specified in 40 CFR 130.7(b)(5).

Consistent with 130.7(b)(5) Arkansas partially utilized the 2006 §303(d) list in making the 2008 assessment. Based on its review of the 2008 Section 303(d) list in light of the 2006 §303(d) list, EPA is disapproving Arkansas' failure to list certain waters. This is discussed in detail under the subtitle "Basis for Decision to Add Waters to Arkansas' 2008 §303(d) list".

EPA has determined that Arkansas took reasonable steps to solicit all existing and readily available water quality-related data and information from members of the public and government agencies. Letters were sent to the governmental agencies followed by a minimum of one follow-up letter to any of the governmental agencies that failed to respond to the initial request. Letters were sent to the U. S. Geological Survey, U. S. Army Corps of Engineers, U. S. Forest Service, Arkansas Natural Resource Commission, and the Arkansas Water Resource Center. No response was received from those letters.

EPA has reviewed Arkansas' description of the data and information it considered, its methodology for identifying waters, and the State's responsiveness summary. EPA concludes that the State properly assembled all existing and readily available data and information, including data

and information relating to the categories of waters specified in 40 CFR 130.7(b)(5). EPA concludes that the State's decisions to list the waters identified in its listing submittal are consistent with federal listing requirements. However, EPA concludes that the State's decision not to list seventy-three (73) water body pollutant pairs is inconsistent with federal listing requirements. As discussed in detail below, the available data and information are sufficient to support a conclusion that these waters are water quality limited and need to be listed pursuant to §303(d). Therefore, EPA is proposing to add seventy-three (73) water body pollutant pairs to Arkansas' list, and will be seeking public comment on these proposed additions.

Except as noted below, the State was diligent in compiling data and completed a good synthesis of individual monitoring data for each water body. ADEQ reviewed the data to determine if it met requirements established in the State's statute and rules related to the identification of impaired waters. Arkansas compiled its 2008 §303(d) list based almost entirely on evaluation of water chemistry data only. The State did not carefully evaluate other types of monitoring data and information – bioassessments, physical integrity, and fish kills for §303(d) listing purposes based on the rationale that its rules precluded their application absent approved water quality standards implementation procedures for narrative standards. As explained below, EPA has determined that these other types of data and information support a conclusion that several waters and pollutants not listed by the State violate State water quality standards and therefore meet federal listing requirements.

1. Waters included by ADEQ on the 2008 §303(d) List, but there was sufficient data or information to refute the listing.

During its review of the 2008 §303(d) List, EPA determined that the twenty (20) water body pollutant pairs listed in Appendix I were listed on the 2008 §303(d) List even though the available data or information did not support such a listing. Of the twenty (20) water body pollutant pairs, six (6) are not impaired based on the new assessment methodology for chronic metal toxicity. Total Maximum Daily Loads (TMDLs) were established by EPA prior to the 2008 listing cycle (April 1, 2008) for nine (9) of the water body pollutant pairs and therefore, these should have been shown in category 4a for the 2008 listing cycle. Five (5) water body pollutant pairs were assessed incorrectly and are meeting the water quality criterion for the specified pollutant. EPA is taking neither an approval nor disapproval action on those identified in Appendix I. See Appendix I for a detailed explanation of EPA's decision not to approve these on the 2008 303(d) List.

2. Waters on the Arkansas 2006 §303(d) List that were delisted on the Arkansas 2008 §303(d) List

EPA compared the listings in the 2006 §303(d) List with those in the 2008 §303(d) List and found that fifty-seven (57) water body pollutant pairs that were on the 2006 §303(d) List were delisted during the 2008 listing cycle. Of the fifty-seven (57) water body pollutant pairs, twenty-six (26) were moved to Category 4a because a TMDL had been established by EPA. The remaining thirty-one (31) water body pollutant pairs were delisted because new data indicates the water body is meeting criteria for the pollutant listed or the change in the assessment for chronic metal toxicity resulted in attainment of the chronic metal criterion. EPA

concur with these delistings. See Appendix II for an itemized listing with specific justifications for delisting.

3. Waters included on the Arkansas 2006 §303(d) list in Category 4b which should have been carried forward to Category 4b of the Arkansas 2008 §303(d) list

Bayou Meto was erroneously included in Category 5 for the 2008 list cycle as impaired for priority organics (PO). EPA believes it was ADEQ's intent to continue the 4b listing from the 2006 list cycle. Lake DuPree was omitted from the 2008 list; however, EPA believes it should be listed in Category 4b as was done on the 2006 §303(d) list. No justification was provided by ADEQ to show water quality standards are now being met. The following information provides the rationale for the continued listing of Bayou Meto and Lake DuPree in Category 4b.

The State demonstrated for the 2 water body pollutant pairs (see table below) in the 2004 listing cycle that there are other pollution control mechanisms required by State, local, or federal authority that will result in attainment of water quality standards within a reasonable time. EPA believes the omission of Lake DuPree to Category 4b on the 2008 303(d) list is in error. Due to the nature of the pollutant, it is reasonable to believe that the mechanisms described on pages 9 and 10 of EPA's 2004 ROD are still being employed. Therefore, as a result of the remedial actions described on pages 9 and 10 of EPA's 2004 ROD, the pollutant sources have been identified and eliminated from the area. Without a source of 2,3,7,8-TCDD, the levels of dioxin in the environment should continue to attenuate. The full attenuation of dioxins in the environment will take place over a long period of time, perhaps a decade or more. Observed decreases in edible fish tissue concentration over the past 5 years indicate that the remedy is effective. Because controls stringent enough per CFR 130.7(b)(1) are already in place, standards support (reduction of fish tissue concentrations to safe levels) is expected to take place without any further actions. Since control mechanisms other than a TMDL are in place and are expected to lead to standards attainment, the waters should be placed in category 4b instead of 5.

STREAM NAME	HUC	REACH	P-SEG	MILES	POLLUTANT	STATUS
Bayou Meto	08020402	007	3B	65.7	Priority organics	4b
Lake DuPree	08020402	Lake	3B	10 acres	Priority organics	4b

4. Waters listed as impaired for Beryllium

There are 26 streams and 9 lakes listed for beryllium on the final 2008 list (See Appendix III). These are primarily the same streams and lakes as were listed on the 2006 303(d) list. Based on the newly adopted 4 MCL criterion, only one water body, Chamberlain Creek, is impaired for beryllium and should be included on the 2008 §303(d) list in Category 5a. The remaining water bodies were apparently listed in error as they are meeting the new criterion and are not impaired. EPA is taking neither an approval or disapproval action on all the water bodies and lakes listed for beryllium except for Chamberlain Creek (HUC 8040102, reach 971). See EPA's 2006 ROD, pages 9 and 10, for a detailed discussion.

Basis for Decision to Add Waters to Arkansas' 2008 Section 303(d) List

This section describes the basis for EPA's decisions to (1) disapprove the State's decision to not list seventy-three (73) water body pollutant pairs, and (2) to identify these water bodies for inclusion on the final 2008 §303(d) list with associated priority rankings.

5. List of water body pollutant pairs which ADEQ omitted from the 2008 §303(d) list and EPA's rationale for adding these to the list.

The purpose of this section is to provide a detailed rationale for EPA's decision to add seventy-three (73) water body pollutant pairs to the Arkansas 2008 §303(d) list. The streams listed in Appendix IV appear to be in violation of the numeric criteria for the listed parameter when assessed in accordance with the 2008 Assessment Methodology. The exception is the total phosphorus listings in the Illinois River watershed. These listings were based on a weight of evidence as described in EPA's 2004 Record of Decision.

a. Fourteen (14) Water body pollutant pairs ADEQ included on the Arkansas 2006 §303(d) list but did not carry forward to the Arkansas 2008 §303(d) list

EPA reviewed these water body pollutant pairs and found that either 1) there was no new data collected since the 2006 listing cycle or 2) new data supported the continuation of the listing. Therefore, there is no basis to delist these water body pollutant pairs from the 2008 §303(d) List. A detailed water body specific justification is provided in Appendix IV, Group a.

b. Twenty-six (26) water body pollutant pairs proposed by EPA for addition to the State's 2006 §303(d) which were not carried forward to the Arkansas 2008 §303(d) list (includes the four (4) Illinois River watershed listings)

Of the seventy-three (73) water body pollutant pairs EPA proposed for addition to the 2006 §303(d) List, twenty-six (26) are still impaired and should remain on the list until new data and information are available to show they are no longer impaired for the pollutant listed. A detailed water body specific justification is provided in Appendix IV, Group b. Included in the twenty-six (26) water body pollutant pairs are the four total phosphorus listings for two reaches of the Osage Creek, Spring Creek and Muddy Fork located in the Illinois River watershed. These waters should remain on the list until new data and information are available to show they are no longer impaired. See EPA's 2004 Record of Decision (ROD) (pages 11-14) for a discussion of the rationale for these four listings.

c. Nine (9) water body pollutant pairs which were included on the Arkansas 2006 §303(d) list either by ADEQ or proposed by EPA but a TMDL is pending EPA review

These nine (9) water body pollutant pairs represented in Appendix IV, Group c have had a TMDL developed which is currently under review at EPA. Assessment of the data for the period of record July 1, 2002 through June 30, 2007 supports the continued

listing of these water body pollutant pairs. Once EPA has approved the TMDLs they can be delisted to Category 4a.

- d. Thirteen (13) water body pollutant pairs omitted from the Arkansas 2008 §303(d) list for impairments other than pathogens

Assessment of the data for the period of record July 1, 2002 through June 30, 2007 supports the listing of these thirteen (13) water body pollutant pairs. These are new listings to the 2008 §303(d) list. A detailed water body specific justification is provided in Appendix IV, Group d.

- e. Eleven (11) water body pollutant pairs omitted from the Arkansas 2008 §303(d) list impaired for pathogens (fecal coliform or E. coli)

EPA compiled the pathogen data submitted by ADEQ into a single data base for assessment purposes. Assessment of the data for the period of record from July 1, 2002 through June 30, 2007 was based on the 2008 Assessment Methodology. EPA found that eleven (11) waters bodies were impaired for either fecal coliform or E. coli bacteria which were (See Group e, Appendix IV) omitted from the Arkansas 2008 §303(d) List. A detailed water body specific justification is provided in Appendix IV, Group e. In addition, a detailed rationale for the proposed pathogen listing for the eight (8) water bodies in the Illinois River watershed along with data is provided in Appendix V.

Priority Ranking and Targeting

EPA also reviewed the State's priority ranking of listed waters for TMDL development, and concludes that the State properly took into account the severity of pollution and the uses to be made of such waters. The State's priority ranking falls into three categories. Those waters with the highest risk of affecting public health or welfare, substantial impact on aquatic life uses, and existing data available for TMDL are given a high priority rank (H). A medium priority rank (M) is assigned to waters with a moderate risk to public health or welfare or to aquatic life uses. A low priority rank (L) is assigned to those waters with the lowest risk to public health or welfare and secondary impact on aquatic life uses.

In addition, EPA reviewed the State's identification of WQLSs targeted for TMDL development in the next two years, and concludes that the targeted waters (high priority) are appropriate for TMDL development in this time frame. EPA concludes, based on these considerations, that the State's priority ranking and targeting commitments are consistent with federal requirements.

Administrative Record Supporting This Action

In support of this decision to approve Arkansas' listing decisions, EPA carefully reviewed the materials submitted by Arkansas with its §303(d) listing decision. The administrative record supporting EPA's decision is comprised of the materials submitted by the State, copies of §303(d), associated federal regulations, and EPA guidance concerning preparation of §303(d) Lists, and this

decision letter and supporting report. EPA determined that the materials provided by the State with its submittal and additional materials and information requested by EPA provided sufficient documentation to support our analysis and findings that the State listing decisions meet the requirements of the Clean Water Act and associated federal regulations. The State may have compiled and considered additional materials as part of its list development process that were not included in the materials submitted to EPA. EPA did not consider these additional materials as part of its review of the listing submission. It was unnecessary for EPA to consider all of the materials considered by the State in order to determine that the State complied with the applicable federal listing requirements. Moreover, federal regulations do not require the State to submit all data and information considered as part of the listing submission.

Appendix I - Listing of twenty (20) water body pollutant pairs identified by EPA which appear to have been listed in error. There is sufficient data and/or information to refute the listing. EPA is taking neither an approval or disapproval action on these water body pollutant pairs.

Stream Name	HUC	RCH	P-Seg	Miles	Station ID	Assess	Pollutant
Deep Bayou	8040205	005	2B	28.9	OUA0151	M	FC
Bayou Bartholomew	8040205	013	2B	33.9	BYB03	M	FC
Bearhouse Creek	8040205	901	2B	24.4	OUA0155	M	FC
Harding Creek	8040205	902	2B	4.6	OUA0145	M	FC
Melton's Creek	8040205	903	2B	8.7	OUA0148	M	FC
Cross Bayou	8040205	905	2B	2.4	OUA0152	M	FC
Chemin-A-Haut Cr	8040205	907	2B	30.5	OUA0012	M	FC
M. Fk. Little Red	11010014	027	4E	8.8	WHI0043	M	FC
M. Fk. Little Red	11010014	028	4E	12.0		E	FC
TMDLs were established by EPA for the above 9 waters on September 21, 2007. These should have been reported in Category 4a.							
Strawberry R.	11010012	006	4G	19.0	WHI0024	M	DO
New data indicates the Strawberry River is no longer impaired for DO. Therefore, this water should not have been included on the 2008 list. It appears this water may have been listed in error.							
Richland Creek	11010005	024	4J	28.7	BUFT09	M	Temp
Temperature criterion is not exceeded for data assessed in both 2006 and 2008. It appears this water may have been listed in error							
Melton's Creek	8040205	903	2B	8.7	OUA0148	M	DO
ADEQ listed in 2006 but also provided justification not to list. EPA accepted ADEQ's justification not to list. ADEQ again listed in 2008 but there is no new data. It appears this water may have been listed in error.							
Big Creek	8040203	904	2C	10.0	OUA0018	M	TP
Big Creek	8040203	904	2C	10.0	OUA0018	M	NO3
Communication with ADEQ confirms Big Creek was listed in error on the 2008 list for TP and NO3. The data do not support such a listing.							
Days Creek	11010005	003	1B	11.0	RED0004A	M	Pb
Not impaired for Lead based on the new assessment methodology which is more stringent. There was only 1 exceedance in the chronic lead criterion during the most recent three years of data. It appears this water may have been listed in error.							
Smackover Creek	8040201	006	2D	14.8	OUA0027	M	Pb
Smackover Creek	8040201	007	2D	29.1		E	Pb
Not impaired for Lead based on the new assessment methodology which is more stringent. There were no copper or lead exceedances during the most recent three years of data. It appears this water may have been listed in error.							
St. Francis River	8020203	014	5A	22.8	FRA0008	M	Cu
St. Francis River	8020203	014	5A	22.8	FRA0008	M	Pb
Not impaired for Copper based on the new assessment methodology which is more stringent. There were no copper or lead exceedances during the most recent three years of data. It appears this water may have been listed in error.							
L' Anguille River	8020205	004	5B	16.0	LGR01	M	Pb
Not impaired for Lead based on the new assessment methodology which is more stringent. There was only 1 exceedance in the chronic lead criterion during the most recent three years of data. It appears this water may have been listed in error.							

Appendix II – List of fifty-seven (57) water body pollutant pairs delisted during the 2008 §303(d) List cycle. In the table below, the shaded rows contain the stream name, HUC, reach, planning segment, Station ID, whether the assessment was based on monitoring data or evaluated based on upstream/downstream data, and pollutant. The non-shaded rows contain a detailed justification for each delisting or group of delistings.

Stream Name	HUC	RCH	P-Seg	Miles	Station ID	Assess	Pollutant
Big Creek	8040203	904	2C	10.0	OUA0018	M	DO
Big Creek	8040203	904	2C	10.0	OUA0018	M	OE
Lake Frierson	8030202	Lake	4B			M	SI
Overflow Creek	11010014	004	4E	21.7		E	FC
Overflow Creek	11010014	006	4E	21.7	OFC01	M	FC
Little Red River	11010014	007	4E	21.4	WHI0059	M	FC
Little Red River	11010014	008	4E	9.0		E	FC
Ten Mile Creek	11010014	009	4E	18.6	TMC01	M	FC
Little Red River	11010014	010	4E	2.9		E	FC
Little Red River	11010014	012	4E	8.0		E	FC
S. F. Little Red R.	11010014	038	4E	14.7	SRR01&02	M	FC
Data Creek	11010009	902	4G	21.8	WHI065	M	FC
Cooper Creek	11010012	003	4G	11.8	WHI0143S	M	FC
Strawberry River	11010012	008	4G	8.4		E	FC
L. Strawberry River	11010012	010	4G	16.0	WHI0143H+	M	FC
L. Strawberry River	11010012	010	4G	16.0	WHI0143H+	FC	EC
Strawberry River	11010012	011	4G	20.4	SBR01	M	FC
Strawberry River	11010012	011	4G	20.4	WHI0143A		FC
Reed's Creek	11010012	014	4G	15.0	RDC01	M	FC
Caney Creek	11010012	015	4G	11.6	WHI0143Q&R	M	FC
Mill Creek	11010012	015	4G	9.9	WHI0143N	M	FC
Mill Creek	11010012	015	4G	9.9	WHI0143N	FC	EC
Horseshoe Lake	8020203	Lake	5A				NU
Bear Creek Lake	8020205	Lake	5A				NU
Old Town Lake	8020303	Lake	5A				NU
Mallard Lake	8020204	Lake	5C				NU
Delisting Justification: TMDLs were established by EPA during 2007 for the 26 waters listed above. These should be placed into Category 4a.							
Bayou Bartholomew	8040205	001	2B	60.1	OUA0013	M	Pb
Saline River	8040204	001	2C	2.8	OUA0010A	E	Zn
Saline River	8040204	002	2C	53.0	OUA0010A	M	Zn
Saline River	8040204	004	2C	16.4		E	Zn
Bayou De L'outre	8040202	006	2D	32.4	OUA0005	M	Pb
Bayou De L'outre	8040202	007	2D	6.9	OUA0005	E	Pb
Bayou De L'outre	8040202	008	2D	10.6	OUA0005	E	Pb
Fourche Creek	11110207	022	3C	9.2	ARK131+	M	Pb
Prairie Cypress	8020304	014	4A	26.1	WHI0073	M	Pb
Bayou DeView	8020302	009	4B	20.3	WHI0026	M	Pb
Bayou DeView	8020302	009	4B	20.3	WHI0026	M	Cu
Bayou DeView	8020302	009	4B	20.3	WHI0026	M	Zn

Lost Creek Ditch	8020302	909	4B	7.9	WHI0172	M	Cu
Lost Creek Ditch	8020302	909	4B	7.9	WHI0172	M	Pb
Lost Creek Ditch	8020302	909	4B	7.9	WHI0172	M	Zn
Delisting Justification: ADEQ changed the way it assessed metals for chronic toxicity beginning with the 2008 listing cycle. The new methodology allows for a single exceedance during the most recent three years of data. This assessment method is more stringent. Reassessing the data using the new methodology results in a delisting for the above 15 waters.							
Saline River	8040204	006	2C	17.5	OUA0118	M	SO4
Arkansas River	11110203	026	3F	2.6	ARK0031	M	TDS
Arkansas River	11110203	027	3F	9.9	ARK0031	E	TDS
Arkansas River	11110203	028	3F	1.2	ARK0031	E	TDS
Arkansas River	11110203	030	3F	5.1	ARK0031	E	TDS
Bayou DeView	8020302	009	4B	20.3	WHI0026	M	AL
Days Creek	11140302	003	1B	11.0	RED0004A	M	SI
Cove Creek	8040102	970	2F	9.6	OUA0159	M	Cu
Cove Creek	8040102	970	2F	9.6	OUA0159	M	pH
L. Missouri River	8040103	008	2G	19.6	OUA0035	M	SI
Bayou Meto	8020402	007	3B	12.3	ARK0050	M	Zn
Chickalah Creek	11110204	002	3G	19.3	ARK0058	M	DO
M. Fk. Little Red	11010014	027	4E	8.8	WHI0043	M	DO
M. Fk. Little Red	11010014	028	4E	12.0		E	DO
White River	11010004	014	4F	4.7	WHI0046	M	Temp
Saline River	8040203	010	2C		OUA26&41	M	SO4
Delisting Justification: New data and information collected for the 16 waters listed above documents the water body is no longer impaired for the pollutant listed.							

Appendix III - Listing of thirty-five (35) water bodies shown as impaired for Beryllium on the 2008 §303(d) List. Chamberlain Creek (HUC 8040102, reach 971) is the only segment proposed by EPA for inclusion on the 2008 §303(d) List. EPA is taking neither an approval or disapproval action on all other Beryllium listings.

Stream Name	HUC	RCH	P-Seg	Miles	Station ID	Assess	Pollutant
Columbia Lake	11140203	Lake	1A			M	Be
Earling	11140205	Lake	1A			M	Be
DeQueen	1114109	Lake	1C			M	Be
Millwood	11140109	Lake	1C			M	Be
Ables Creek	8040205	911	2B	14.6	OUA0158	M	Be
Saline River	8040203	007	2C	3.8	OUA0042	M	Be
Big Creek	8040203	904	2C	10.0	OUA0018	M	Be
Saline River	8040204	002	2C	53.00	OUA0010A+	M	Be
Big Creek	8040204	005	2C	28.9	OUA0043	M	Be
Saline River	8040204	006	2C	17.5	OUA0118	M	Be
Big Cornie Creek	8040206	015	2E	15.0	OUA0002	M	Be
Ouachita Lake	8040101	Lake	2F			M	Be
Ouachita River	8040102	007	2F	14.5	OUA0006	M	Be
Caddo River	8040102	016	2F	13.5	OUA0023	M	Be
D.C. Creek	8040102	923	2F	5.0	OUA0044T	M	Be
Cove Creek	8040102	970	2F	9.6	OUA0159	M	Be
Chamberlain Creek	8040102	971	2F	2.5	OUA0104	M	Be
Lucinda Creek	8040102	975	2F	2.2	OUA0171B	M	Be
DeGray Lake	8040102	Lake	2F			M	Be
Arkansas River	11110207	01	3C	6.7	ARK0048	M	Be
Fourche Creek	11110207	024	3C	11.2	ARK0130+	M	Be
Beaverfork Lake	11110205	Lake	3D			M	Be
Atkins Lake	11110203	Lake	3F			M	Be
Overcup Lake	11110203	Lake	3F			M	Be
Petit Jean River	11110204	011	3G	21.6	ARK0034	M	Be
Lost Creek Ditch	8020302	909	4B	7.9	WHI0172	M	Be
Bear Creek	11010003	045	4I	25.9	WHI0174	M	Be
Crooked Creek	11010003	049	4I	36.2	WHI0067	M	Be
White River	11010001	027	4K	23.8	WHI0106	M	Be
War Eagle Creek	11010001	034	4K	22.2	WHI0116	M	Be
Kings River	11010001	042	4K	39.5	WHI0123	M	Be
Dry Fork Creek	11010001	043	4K	16.5	WHI0127	M	Be
Osage Creek	11010001	047	4K	13.4	WHI0130	M	Be
Yocum Creek	11010001	052	4K	16.2	WHI0137	M	Be
St. Francis River	8020203	014	5A	22.8	FRA0008	M	Be

Appendix IV - List of seventy-three (73) water body pollutant pairs EPA is proposing to add to the 2008 §303(d) List. In the table below, the proposed additions are grouped into five categories a through e. The shaded rows contain the stream name, HUC, reach, planning segment, Station ID, whether the assessment was based on monitoring data or evaluated based on upstream/downstream data, pollutant and priority ranking. The non-shaded rows contain EPA's detailed justification for including the water body pollutant pair on the 2008 §303(d) List. Below table below is a brief description for each of the groups followed by a second table with individually specific justifications provided to support a listing action.

Group	Brief Description	Number
a	State listed in 2006 but not carried forward to 2008; data supports continued listing	14
b	EPA added to 2006 list; data supports continued listing in 2008	26
c	TMDLs are under EPA review; data supports continued listing in 2008	9
d	New 2008 EPA proposed listings: various pollutants	13
e	New 2008 EPA proposed listings: pathogens	11
	Total	73

Group	Stream Name	HUC	RCH	P-Seg	Station ID	Assess	Pollutant	Priority
a	Big Creek	11140203	923	1A	BIG01	M	Pb	L
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to 2008 list.							
a	Dorcheat Bayou	11140203	026L	1A	UWBBDT02		DO	L
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
a	Able's Creek	8040205	911	2B	OUA0158	M	SI	M
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
a	Bayou Bartholomew	8040205	006	2B	OUA0033	M	Pb	M
	EPA Justification: There are 4 exceedances in the chronic lead criterion during the most recent 3 years of data; only one exceedance allowed based on 2008 Assessment Methodology.							
a	Bayou Bartholomew	8040205	013	2B	BYB03	M	DO	M
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
a	Overflow Creek	8040205	908	2B	OUA0012A	M	Cl	M
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
a	Wolf Creek	8040205	701	2B	OUA0156	M	DO	L
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
a	Big Creek	8040204	005	2C	OUA0043	M	pH	L
	EPA Justification: 5/41 (>10%) samples exceed the pH criterion for the period of record.							
a	Smackover Creek	8040201	006	2D	OUA0027	M	SI	L
a	Smackover Creek	8040201	007	2D		E	SI	L

	EPA Justification: ADEQ listed in 2006; new data in 2008 supports continued listing.							
a	Ten Mile Bayou	8020203	006t	5A	FRA0029	M	DO	L
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
a	Prairie Creek	8020205	901	5B	FRA0035	M	Cl	L
a	Prairie Creek	8020205	901	5B	FRA0035	M	SO4	L
a	Prairie Creek	8020205	901	5B	FRA0035	M	TDS	L
	EPA Justification: ADEQ listed in 2006; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Dorcheat Bayou	11140203	024	1A		E	Pb	L
	EPA Justification: New data for 2008 list cycle. There are 7 exceedances in the chronic lead criterion during the most recent 3 years of data. Only 1 exceedance is allowable.							
b	Blue Bayou	8020301	009	1C	BLB0001	M	FC	L
	EPA Justification: EPA added to the 2006 list; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Little Cossatot R.	11140109	?	1C	LCO01	M	TDS	L
	EPA Justification: EPA added to the 2006 list; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Bearhouse Creek	8040205	901	2B	OUA0155	M	Cu	L
	EPA Justification: EPA added to the 2006 list; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Melton's Creek	8040205	903	2B	OUA0148	M	SI	L
	EPA Justification: EPA added to the 2006 list; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Salt Creek	8040201	806	2D	OUA137D	M	pH	L
	EPA Justification: EPA added to the 2006 list; no new data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Big Piney Creek	11110202	018	3H	ARK105	M	FC	L
	EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Hurricane Creek	11110202	022	3H	ARK119	M	FC	L
	EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Little Piney Creek	11110202	024	3H	ARK104	M	FC	L
	EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Little Piney Creek	11110202	025	3H	ARK126	M	FC	L
	EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Mill Creek	11110202	901	3H	ARK110	M	FC	L
	EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.							
b	Walnut Creek:	11110202	902	3H	ARK125	M	FC	L

EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	Muddy Fork	11110103	027	3J		M	TP	H
b	Osage Creek	11110103	030	3J	ARK0041	M	TP	H
b	Osage Creek	11110103	930	3J	ARK041 (eval)	M	TP	H
b	Spring Creek	11110103	931	3J	SPG03+	M	TP	H
The 4 waters listed above were originally added by EPA to the AR 303(d) list. The rationale for EPA's decision is found in EPA's 2004 and 2006 Records of Decision. There has been no new data to support a delisting; therefore, the listing must be carried forward.								
b	Town Branch	11110103	901	3J	ARK0056	M	TP	H
EPA Justification: ADEQ listed in 2004 but did not carry the listing forward to 2006. EPA added to the 2006 list. ADEQ did not provide a justification for delisting in 2008.								
b	Cache River	8020302	028	4B	CHR04	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	Glaise Creek	11010013	021	4C	GSC01	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	Village Creek	11010013	012	4C	VGC02	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	Bull Creek	8020301	009	4D	UWBLB01	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	M. Fk. Little Red	11010014	030	4E	UWMFK01	M	SI	H
EPA Justification: EPA added to the 2006 list; no new data for assessment for the 2008 list; must carry over to the 2008 list.								
b	Big Creek	11010014	018	4F	WHI0164	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	Greenbrier Creek	11010014	017	4F	WHI0167	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	South Big Creek	11010012	013	4G	WHI0143J	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
b	Strawberry R.	11010012	009	4G	SBR02	M	FC	L
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list.								
c	Holly Creek	11140109	013	1C	RED34A&B	M	FC	M
EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list. A TMDL is currently under review. Retain on list until TMDL is approved.								
c	Mine Creek	11140109	033	1C	RED0048B+	M	FC	M

	EPA Justification: EPA added to the 2006 list; no new fecal coliform data for assessment for the 2008 list; must carry over to the 2008 list. A TMDL is currently under review. Retain on list until TMDL is approved.							
c	Mine Creek	11140109	033	1C	RED0048A & 18B	M	EC	M
	EPA Justification: EPA added to the 2006 list; no new E. coli data for assessment for the 2008 list; must carry over to the 2008 list. A TMDL is currently under review. Retain on list until TMDL is approved.							
c	Bayou Bartholomew	8040205	001	2B	OUA13 & OUA12A	M	Cl	M
	EPA Justification: EPA added to the 2006 list; no new data for assessment for the 2008 list; TMDL under EPA review. Retain on list until TMDL approved.							
c	Smackover Creek	8040201	006	2D	OUA0027	M	Zn	L
c	Smackover Creek	8040201	007	2D		E	Zn	L
	EPA Justification: New data for 2008 list cycle. 4 exceedances in the chronic zinc criterion during the most recent 3 years of data. Only 1 exceedance is allowable under the 2008 Assessment Methodology. TMDL under EPA review. Retain on list until TMDL is approved.							
c	Cypress Bayou	8020301	010	4D	CPB01	M	FC	M
c	Cypress Bayou	8020301	011	4D		E	FC	M
c	Cypress Bayou	8020301	012	4D		E	FC	M
	EPA Justification: EPA added to 2006 list; no new data for assessment for the 2008 list; TMDL is under EPA review. Retain on list until TMDL approved.							
d	Saline River	11140109	014	1C	RED0032	M	DO	M
	EPA Justification: 4/11 samples (>10%) exceed the critical DO criterion of 6 mg/L.							
d	Saline River	8040204	002	2C	OUA0117	M	Pb	L
	EPA Justification: There are 3 exceedances in the chronic lead criterion during the most recent 3 years of data. Only 1 exceedance is allowable under the 2008 Assessment Methodology							
d	Marzan Creek	8040101	045	2F	MZC0001	M	pH	L
	EPA Justification: 3/10 samples (>10%) exceed the pH criterion.							
d	Prairie Creek	8040101	048	2F	OUA0040	M	DO	L
	EPA Justification: 3/13 samples (>10%) exceed the critical DO criterion of 6 mg/l.							
d	Ouachita River	8040102	007	2F	OUA0006A	M	Zn	L
	EPA Justification: There are 2 exceedances in the chronic zinc criterion during the most recent 3 years of data. Only 1 exceedance is allowable under the 2008 Assessment Methodology.							
d	Fourche Creek	11110207	024	3C	ARK0147H	M	Cu	L
	EPA Justification: There are 2 exceedances in the chronic copper criterion during the most recent 3 years of data. Only 1 exceedance is allowable under the 2008 Assessment Methodology.							
d	Cadron Cr., E. Fk	11110205	002	3D	ARK0158	M	SI	L
	EPA Justification: 5/10 samples (>20%) exceed the turbidity criterion (40NTU) for all flows. Based on a sample size of 12, 4 exceedances are allowable.							
d	Cedar Cr.	11110206	011	3E	CED0001	M	pH	L
	EPA Justification: 5/10 samples (>10%) exceed the pH criterion. Based on a sample size of 12, 2 exceedances are allowable.							
d	Fourche La Fave R.	11110206	001	3E	ARK0036	M	DO	L
	EPA Justification: 3/7 samples (>10%) exceed the critical season DO criterion of 5 mg/l. Based on a sample size of 12, 2 exceedances are allowable.							
d	Gafford Creek	11110206	012	3E	GAF0001	M	pH	L

	EPA Justification: 5/9 samples (>10%) exceed the pH criterion. Based on a sample size of 12, 2 exceedances are allowed.							
d	Chickalah Creek	11110204	002	3G	ARK0058	M	SI	L
	EPA Justification: 5/16 samples (>25%) exceed the base flow turbidity criterion (31 NTU).							
d	Big Creek	11010005	027	4J	BUFT18	M	DO	L
	EPA Justification: 3/5 samples (>10%) exceed the critical season DO criterion of 6 mg/l. Based on a sample size of 12, 2 exceedances are allowed.							
d	Leatherwood Creek	11010001	?	4K	WHI0012B	M	DO	L
	EPA Justification: 3/7 samples (>10%) exceed the critical season DO criterion of 5 mg/l. Based on a sample size of 12, 2 exceedances are allowed.							
e	S. Fork Ouachita R.	8040101	043	2F	UWSFO01		EC	L
	EPA Justification: 3/7 samples (>25%) exceed the primary contact season criterion of 410 col/100 ml.							
e	Fourche Creek	11110207	022	3C	ARK0147E		FC	L
	EPA Justification: 3/8 samples (>25%) exceed the Primary Contact Season criterion of 400 col/100 ml.							
e	Fourche Creek	11110207	024	3C	ARK0147D+		FC	L
	EPA Justification: 3/8 samples (>25%) exceed the Primary Contact Season criterion of 400 col/100 ml. 6/21 samples (>25%) exceed the secondary contact season criterion of 2000 col/100 ml.							
e	Baron Fork	11110103	013	3J	ARK0007A		EC	H
	EPA Justification: Geometric mean of 5 primary contact season samples collected over a 30-day period is 155 col/100 ml. This exceeds the 30-day geometric mean criterion of 126 col/100 ml.							
e	Illinois River	11110103	023	3J	ILL04		EC	H
	EPA Justification: Geometric mean of 5 primary contact season samples collected over a 30-day period is 303 col/100 ml. This exceeds the 30-day geometric mean of 126 col/100 ml.							
e	Illinois River	11110103	024	3J	ARK0040		EC	H
	EPA Justification: Geometric mean of 5 primary contact season samples collected over a 30 day period is 323 col/100 ml. This exceeds the 30-day geometric mean of 126 col/100 ml.							
e	Illinois River	11110103	028	3J	ILL01		EC	H
	EPA Justification: Geometric mean of 5 primary contact season samples collected over a 30-day period is 519 col/100 ml. This exceeds the 30-day geometric mean of 126 col/100 ml.							
e	Little Osage Creek	11110103	930	3J	ARK0155		EC	H
	EPA Justification: Geometric mean of 5 primary contact season samples collected over a 30-day period is 278 col/100 ml. This exceeds the 30-day geometric mean of 126 col/100 ml.							
e	Muddy Fork	11110103	025	3J	MFI0004		EC	H
	EPA Justification: 30-day geometric mean of 5 primary contact season samples is 434 col/100 ml. This exceeds the 30-day geometric mean of 126 col/100 ml.							
e	Osage Creek	11110103	030	3J	ARK0041		EC	H
	EPA Justification: 30-day geometric mean of 5 primary contact season samples is 312 col/100 ml. This exceeds the 30-day geometric mean of 126 col/100 ml. 6/9 primary contact season samples (>25%) exceed the ESW criterion of 298 col/100 ml.							
e	Spring Creek	11110103	931	3J	SPG03		EC	H
	EPA Justification: 30-day geometric mean of 5 primary contact season samples is 295 col/100 ml. This exceeds the 30-day geometric mean of 126 col/100 ml.							

Appendix V – EPA Rationale to Support the Illinois River Basin Pathogen Listing Decisions

EPA's review of the 2008 IR, with respect to pathogen data in the Illinois River basin consisted of applying the Arkansas Department of Environmental Quality's (ADEQ) 2008 assessment methodology to Arkansas' ambient monitoring data for the period of record from July 1, 2002 through June 2007. Waters were listed where at least 8 samples were available during the primary contact or secondary contact recreational seasons and 25% of samples exceeded the applicable single sample maximum criterion and/or the 30-day never to be exceeded geometric mean criterion.

EPA reviewed available E. coli data collected during the period of record from 13 stations in the Arkansas portion of the Illinois River basin (Attachment C). Data were available from October 2005 through June 2007. All of the data (summer and winter) was used to assess the secondary contact recreational use. Only summer data collected from May through September was used to assess the primary contact recreation use.

Primary Contact Use Assessment

EPA followed the assessment procedure described in the ADEQ 2008 Assessment Methodology (Attachment A). Two criteria for E. coli were applicable, 1) a single sample maximum value of 298 col/100 ml for ERW, ESW, NSW and lakes and reservoirs and 400 col/100 for all other waters and 2) a "never to be exceeded" geometric mean of 126 col/100 ml. The geometric mean is 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, the water body will be listed as impaired.

According to Arkansas' 2008 Assessment Methodology, "the number of data points exceeding the criteria which are necessary for a "non-support" decision will be calculated and rounded up to the nearest whole number", e.g. if there are 9 data points, under the State's methodology, 3 exceedances would equal 25%, since $9 \times 0.25 = 2.25$, which is rounded up to 3. Therefore, in this example, 3 exceedances of the criteria results in a decision that the water body is not required to be listed, since 4 exceedances would be needed to list as impaired. For the primary contact recreational use, one water was assessed as impaired (Attachment B, Table 1).

EPA assessed against the 30-day geometric mean as described in the 2008 Arkansas Assessment Methodology, i.e. taking the geometric mean of the 5 data points collected weekly from August 28, 2006 through September 26, 2006. A water body was assessed as impaired if the 30-day geometric mean was greater than the criterion of 126 col/100 ml. For the primary contact recreational use, eleven waters were assessed as impaired (Attachment B, Table 1).

Secondary Contact Recreation Use Assessment

EPA followed the assessment procedure described in the ADEQ 2008 Assessment Methodology (see Attachment A). Two criteria for E. coli were applicable, 1) a single sample

maximum value of 1490 col/100 ml for ERW, ESW, NSW and lakes and reservoirs and 2050 col/100 for all other waters and 2) a “never to be exceeded” geometric mean of 630 col/100 ml. The geometric mean is 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 water body will be listed as impaired.

There were no exceedances of the secondary contact recreation criteria either for the single sample maximum or the 30-day geometric mean (Attachment B, Table 2).

Attachment A: Excerpt from the 2008 Assessment Methodology Describing Pathogen Assessments

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 water body 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

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

ERW – Extraordinary Resource Waters
ESW – Ecologically Sensitive Waterbody

NSW – Natural and Scenic Waterways

Attachment B: Summary of E. coli Assessments

Table 1: Primary contact recreational use assessment results using the May through June 2006 data plus a single sample datum from either May or June 2007. Exceedances for the applicable criteria are bolded. The last column is to summarize the results of the single sample max assessment or the 30-day geometric mean assessment for each row. If a value is bolded there will be a corresponding "Y" for impaired in the last column.

Stream Name	Designation	Station ID	Location	Reach	Single Sample Max Assessment			30-day Geometric Mean*, n=5	Impaired Y/N
					Total Samples	Allowable Exceedances	Exceedances		
Illinois River	ESW	ARK0006	at Hwy 59	-020	9	3	1	84	N
Baron Fork		ARK0007A	Hwy 59 Bridge	-013	8	2	1	164	Y
Cincinnati Creek		ARK0141	at Hwy 244 bridge	-021	4	2	0		N
Clear Creek		ARK0010C	at Hwy 112 bridge	-029	9	3	2	255	Y
Clear Creek		CLR05	County Rd nr Savoy	-029	9	3	3	407	Y
Illinois River	ESW	ARK0040	Hwy 16 nr Savoy	-024	9	3	3	323	Y
Osage Creek	ESW	ARK0041	Nr Elm Springs	-030	9	3	2	312	Y
Osage Creek		OSC08			10	3	3	463	Y
Little Osage Creek		ARK0155	at Hwy 264	-930	9	3	2	278	Y
Spring Creek		SPG03	S. of Cave Springs	-091	10	3	3	295	Y
Muddy Fork	ESW	MF104	County Rd S. of Savoy	-025	9	3	6	434	Y
Illinois River		ILL01	W. of Farmington	-028	9	3	3	519	Y
Illinois River		ILL04	S. of Logan	-023	10	3	3	303	Y

* Samples collected weekly between August 28, 2006 and September 26, 2006

Table 2: Secondary contact recreational use assessment results. There were no exceedances in the criteria for this assessment.

Stream Name	Designation	Station ID	Location	Reach	Single Sample Max Assessment			30-day Geometric Mean*, n=5	Impaired Y/N
					Total Samples	Allowable Exceedances	Exceedances		
Illinois River	ESW	ARK0006	at Hwy 59	-020	10	3	0	84	N
Baron Fork		ARK0007A	Hwy 59 Bridge	-013	9	3	0	164	N
Cincinnati Creek		ARK0141	at Hwy 244 bridge	-021	4	2	0		N
Clear Creek		ARK0010C	at Hwy 112 bridge	-029	9	3	0	255	N
Clear Creek		CLR05	County Rd nr Savoy	-029	16	4	0	407	N
Illinois River	ESW	ARK0040	Hwy 16 nr Savoy	-024	10	3	0	323	N
Osage Creek	ESW	ARK0041	Nr Elm Springs	-030	9	3	0	312	N
Osage Creek		OSC08			17	5	0	463	N
Little Osage Creek		ARK0155	at Hwy 264	-930	16	4	0	278	N
Spring Creek		SPG03	S. of Cave Springs	-091	17	5	0	295	N
Muddy Fork	ESW	MF104	County Rd S. of Savoy	-025	16	4	0	434	N
Illinois River		ILL01	W. of Farmington	-028	17	5	0	519	N
Illinois River		ILL04	S. of Logan	-023	17	5	0	303	N

* Samples collected weekly between August 28, 2006 and September 26, 2006

Attachment C: E. coli Data for Stations in the Illinois River basin.

The primary contact recreation use (summer season) assessment utilized the data from May through September. All data was utilized for the secondary contact recreation use (summer and winter season combined) assessment. Shaded rows represent the data used for the 30-day geometric mean calculations for the primary contact season. Bolded values represent an exceedance in the appropriate single sample maximum criteria for the primary contact season. None of the counts exceeded the appropriate single sample maximum criterion or the 30-day geometric mean criterion for the secondary contact season assessment.

Illinois River south of Siloam Springs, AR at Hwy 59 Bridge, Reach 20, ESW

Station ID	Date	Season	Water Body	Parameter	Result
ARK0006	11-Oct-05	Winter	Illinois River	EC	14
ARK0006	23-May-06	Summer	Illinois River	EC	17
ARK0006	19-Jun-06	Summer	Illinois River	EC	24
ARK0006	17-Jul-06	Summer	Illinois River	EC	7
ARK0006	28-Aug-06	Summer	Illinois River	EC	232
ARK0006	06-Sep-06	Summer	Illinois River	EC	14
ARK0006	07-Sep-06	Summer	Illinois River	EC	14
ARK0006	11-Sep-06	Summer	Illinois River	EC	128
ARK0006	19-Sep-06	Summer	Illinois River	EC	700
ARK0006	26-Sep-06	Summer	Illinois River	EC	175

Baron Fork on County Road 21 near Dutch Mills, Reach 13

Station ID	Date	Season	Water Body	Parameter	Result
ARK0007A	11-Oct-05	Winter	Baron Fork	EC	296
ARK0007A	23-May-06	Summer	Baron Fork	EC	116
ARK0007A	19-Jun-06	Summer	Baron Fork	EC	42
ARK0007A	17-Jul-06	Summer	Baron Fork	EC	4
ARK0007A	28-Aug-06	Summer	Baron Fork	EC	850
ARK0007A	06-Sep-06	Summer	Baron Fork	EC	92
ARK0007A	11-Sep-06	Summer	Baron Fork	EC	100
ARK0007A	19-Sep-06	Summer	Baron Fork	EC	92
ARK0007A	26-Sep-06	Summer	Baron Fork	EC	125

Cincinnati Creek near Cincinnati, Arkansas

Station ID	Date	Season	Water Body	Parameter	Result
ARK0141	23-May-06	Summer	Cincinnati Creek	EC	7
ARK0141	19-Jun-06	Summer	Cincinnati Creek	EC	3
ARK0141	17-Jul-06	Summer	Cincinnati Creek	EC	4
ARK0141	28-Aug-06	Summer	Cincinnati Creek	EC	3

Clear Creek at Hwy. 112 Bridge, Reach 29, TMDL completed

Station ID	Date	Season	Water Body	Parameter	Result
ARK0010C	23-May-06	Summer	Clear Creek	EC	80
ARK0010C	19-Jun-06	Summer	Clear Creek	EC	72
ARK0010C	17-Jul-06	Summer	Clear Creek	EC	56

ARK0010C	28-Aug-06	Summer	Clear Creek	EC	700
ARK0010C	06-Sep-06	Summer	Clear Creek	EC	69
ARK0010C	11-Sep-06	Summer	Clear Creek	EC	750
ARK0010C	19-Sep-06	Summer	Clear Creek	EC	200
ARK0010C	26-Sep-06	Summer	Clear Creek	EC	150
ARK0010C	27-Sep-06	Summer	Clear Creek	EC	50

Illinois River near Savoy, Arkansas, Reach 24, ESW

Station ID	Date	Season	Water Body	Parameter	Result
ARK0040	11-Oct-05	Winter	Illinois River	EC	14
ARK0040	23-May-06	Summer	Illinois River	EC	55
ARK0040	19-Jun-06	Summer	Illinois River	EC	100
ARK0040	17-Jul-06	Summer	Illinois River	EC	36
ARK0040	28-Aug-06	Summer	Illinois River	EC	575
ARK0040	06-Sep-06	Summer	Illinois River	EC	108
ARK0040	11-Sep-06	Summer	Illinois River	EC	625
ARK0040	19-Sep-06	Summer	Illinois River	EC	525
ARK0040	26-Sep-06	Summer	Illinois River	EC	172
ARK0040	21-May-07	Summer	Illinois River	EC	150

Little Osage Creek at Hwy 264, Reach 930

Station ID	Date	Season	Water Body	Parameter	Result
ARK0155	23-Jan-06	Winter	Osage Creek	EC	20
ARK0155	11-Apr-06	Winter	Osage Creek	EC	21
ARK0155	23-May-06	Summer	Osage Creek	EC	62
ARK0155	19-Jun-06	Summer	Osage Creek	EC	116
ARK0155	17-Jul-06	Summer	Osage Creek	EC	100
ARK0155	28-Aug-06	Summer	Osage Creek	EC	875
ARK0155	06-Sep-06	Summer	Osage Creek	EC	128
ARK0155	11-Sep-06	Summer	Osage Creek	EC	900
ARK0155	19-Sep-06	Summer	Osage Creek	EC	164
ARK0155	26-Sep-06	Summer	Osage Creek	EC	100
ARK0155	27-Nov-06	Winter	Osage Creek	EC	55
ARK0155	18-Dec-06	Winter	Osage Creek	EC	72
ARK0155	26-Feb-07	Winter	Osage Creek	EC	17
ARK0155	26-Mar-07	Winter	Osage Creek	EC	116
ARK0155	23-Apr-07	Winter	Osage Creek	EC	124
ARK0155	18-Jun-07	Summer	Osage Creek	EC	144

Clear Creek S of Savoy, TMDL completed

Station ID	Date	Season	Water Body	Parameter	Result
CLR05	23-Jan-06	Winter	Clear Creek	EC	7
CLR05	11-Apr-06	Winter	Clear Creek	EC	4
CLR05	23-May-06	Summer	Clear Creek	EC	92
CLR05	19-Jun-06	Summer	Clear Creek	EC	35
CLR05	17-Jul-06	Summer	Clear Creek	EC	68
CLR05	28-Aug-06	Summer	Clear Creek	EC	675

CLR05	06-Sep-06	Summer	Clear Creek	EC	80
CLR05	11-Sep-06	Summer	Clear Creek	EC	1250
CLR05	19-Sep-06	Summer	Clear Creek	EC	475
CLR05	26-Sep-06	Summer	Clear Creek	EC	350
CLR05	27-Nov-06	Winter	Clear Creek	EC	168
CLR05	18-Dec-06	Winter	Clear Creek	EC	100
CLR05	26-Feb-07	Winter	Clear Creek	EC	35
CLR05	26-Mar-07	Winter	Clear Creek	EC	41
CLR05	23-Apr-07	Winter	Clear Creek	EC	48
CLR05	21-May-07	Summer	Clear Creek	EC	200

Illinois River W. of Farmington, Reach 28

Station ID	Date	Season	Water Body	Parameter	Result
ILL0001	11-Oct-05	Winter	Illinois River	EC	32
ILL0001	23-Jan-06	Winter	Illinois River	EC	33
ILL0001	11-Apr-06	Winter	Illinois River	EC	4
ILL0001	23-May-06	Summer	Illinois River	EC	164
ILL0001	19-Jun-06	Summer	Illinois River	EC	184
ILL0001	17-Jul-06	Summer	Illinois River	EC	120
ILL0001	28-Aug-06	Summer	Illinois River	EC	850
ILL0001	06-Sep-06	Summer	Illinois River	EC	244
ILL0001	11-Sep-06	Summer	Illinois River	EC	1500
ILL0001	19-Sep-06	Summer	Illinois River	EC	775
ILL0001	26-Sep-06	Summer	Illinois River	EC	156
ILL0001	27-Nov-06	Winter	Illinois River	EC	800
ILL0001	18-Dec-06	Winter	Illinois River	EC	208
ILL0001	26-Feb-07	Winter	Illinois River	EC	160
ILL0001	26-Mar-07	Winter	Illinois River	EC	220
ILL0001	23-Apr-07	Winter	Illinois River	EC	550
ILL0001	21-May-07	Summer	Illinois River	EC	275

Illinois River S. of Logan – Reach 023

Station ID	Date	Season	Water Body	Parameter	Result
ILL0004	23-Jan-06	Winter	Illinois River	EC	7
ILL0004	11-Apr-06	Winter	Illinois River	EC	4
ILL0004	23-May-06	Summer	Illinois River	EC	120
ILL0004	19-Jun-06	Summer	Illinois River	EC	27
ILL0004	17-Jul-06	Summer	Illinois River	EC	44
ILL0004	28-Aug-06	Summer	Illinois River	EC	550
ILL0004	06-Sep-06	Summer	Illinois River	EC	108
ILL0004	11-Sep-06	Summer	Illinois River	EC	1020
ILL0004	19-Sep-06	Summer	Illinois River	EC	425
ILL0004	26-Sep-06	Summer	Illinois River	EC	100
ILL0004	27-Sep-06	Summer	Illinois River	EC	125
ILL0004	27-Nov-06	Winter	Illinois River	EC	104
ILL0004	18-Dec-06	Winter	Illinois River	EC	97
ILL0004	26-Feb-07	Winter	Illinois River	EC	96

ILL0004	26-Mar-07	Winter	Illinois River	EC	124
ILL0004	23-Apr-07	Winter	Illinois River	EC	62
ILL0004	21-May-07	Summer	Illinois River	EC	160

Muddy Fork ILL R. S. of Savoy, Reach 25, ESW

Station ID	Date	Season	Water Body	Parameter	Result
MFI04	23-Jan-06	Winter	Muddy Fork ILL R.	EC	87
MFI04	11-Apr-06	Winter	Muddy Fork ILL R.	EC	17
MFI04	23-May-06	Summer	Muddy Fork ILL R.	EC	800
MFI04	19-Jun-06	Summer	Muddy Fork ILL R.	EC	400
MFI04	17-Jul-06	Summer	Muddy Fork ILL R.	EC	228
MFI04	28-Aug-06	Summer	Muddy Fork ILL R.	EC	600
MFI04	06-Sep-06	Summer	Muddy Fork ILL R.	EC	108
MFI04	11-Sep-06	Summer	Muddy Fork ILL R.	EC	1050
MFI04	19-Sep-06	Summer	Muddy Fork ILL R.	EC	825
MFI04	26-Sep-06	Summer	Muddy Fork ILL R.	EC	275
MFI04	27-Nov-06	Winter	Muddy Fork ILL R.	EC	550
MFI04	18-Dec-06	Winter	Muddy Fork ILL R.	EC	400
MFI04	26-Feb-07	Winter	Muddy Fork ILL R.	EC	525
MFI04	26-Mar-07	Winter	Muddy Fork ILL R.	EC	325
MFI04	23-Apr-07	Winter	Muddy Fork ILL R.	EC	500
MFI04	21-May-07	Summer	Muddy Fork ILL R.	EC	325

Osage Creek

Station ID	Date	Season	Water Body	Parameter	Result
OSC08	23-Jan-06	Winter	Little Osage Creek	EC	33
OSC08	11-Apr-06	Winter	Little Osage Creek	EC	24
OSC08	23-May-06	Summer	Little Osage Creek	EC	188
OSC08	19-Jun-06	Summer	Little Osage Creek	EC	168
OSC08	17-Jul-06	Summer	Little Osage Creek	EC	160
OSC08	28-Aug-06	Summer	Little Osage Creek	EC	1000
OSC08	06-Sep-06	Summer	Little Osage Creek	EC	140
OSC08	11-Sep-06	Summer	Little Osage Creek	EC	1500
OSC08	19-Sep-06	Summer	Little Osage Creek	EC	850
OSC08	26-Sep-06	Summer	Little Osage Creek	EC	119
OSC08	27-Sep-06	Summer	Little Osage Creek	EC	200
OSC08	27-Nov-06	Winter	Little Osage Creek	EC	550
OSC08	18-Dec-06	Winter	Little Osage Creek	EC	108
OSC08	26-Feb-07	Winter	Little Osage Creek	EC	84
OSC08	26-Mar-07	Winter	Little Osage Creek	EC	212
OSC08	23-Apr-07	Winter	Little Osage Creek	EC	180
OSC08	18-Jun-07	Summer	Little Osage Creek	EC	140

Spring Creek S of Cave Springs, Reach 931

Station ID	Date	Season	Water Body	Parameter	Result
SPG03	23-Jan-06	Winter	Spring Creek	EC	40
SPG03	11-Apr-06	Winter	Spring Creek	EC	3

SPG03	23-May-06	Summer	Spring Creek	EC	132
SPG03	19-Jun-06	Summer	Spring Creek	EC	88
SPG03	17-Jul-06	Summer	Spring Creek	EC	252
SPG03	28-Aug-06	Summer	Spring Creek	EC	1650
SPG03	06-Sep-06	Summer	Spring Creek	EC	104
SPG03	11-Sep-06	Summer	Spring Creek	EC	425
SPG03	19-Sep-06	Summer	Spring Creek	EC	450
SPG03	26-Sep-06	Summer	Spring Creek	EC	68
SPG03	27-Sep-06	Summer	Spring Creek	EC	50
SPG03	27-Nov-06	Winter	Spring Creek	EC	120
SPG03	18-Dec-06	Winter	Spring Creek	EC	38
SPG03	26-Feb-07	Winter	Spring Creek	EC	21
SPG03	26-Mar-07	Winter	Spring Creek	EC	92
SPG03	23-Apr-07	Winter	Spring Creek	EC	84
SPG03	18-Jun-07	Summer	Spring Creek	EC	125

Appendix VI: Listing of administrative records used in the review of the Arkansas 2006 §303(d) List.

1. Arkansas Water Quality Standards, Arkansas Pollution Control and Ecology Commission, Regulation 2, September 28, 2007.
2. EPA, 2008, EPA Record of Decision on the 2006 303(d) list.
http://www.epa.gov/region06/6wq/npdes/tmdl/303d/ar/2006-list-rod_final.pdf
3. EPA, 2007, EPA Record of Decision on the 2004 303(d) list.
http://www.epa.gov/region06/6wq/npdes/tmdl/303d/ar/2004-list-rod_final.pdf
4. EPA, October 12, 2006 memorandum from Diane Regas, Director, Assessment and Watershed Protection Division, Office of Water, EPA headquarters to Regions 1–10 Water Division Directors; Robert Maxwell, Director, Office of Environmental Measurement and Evaluation Region 1, Barbara Finazzo, Director, Division of Environmental Science and Assessment Region 2, Gale Hutton, Director, Environmental Services Division, Region 7 and Bill Riley, Director, Office of Environmental Assessment, Region 10 regarding “Information Concerning 2008 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions”, http://www.epa.gov/owow/tmdl/2008_ir_memorandum.html
5. EPA, 2005, *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act*, EPA Office of Water, July 29, 2005.
6. EPA, 2003, *Guidance for 2004 Assessment, listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act* EPA: TMDL-01-03 U.S. Environmental Protection Agency, Office of Water, Washington, DC.
7. EPA 2002, *Consolidated Assessment and Listing Methodology*, EPA Office of Water, July 2002.
8. EPA 2000, April 28, 2000 memorandum from Robert H. Wayland, III, Director, Office of Wetlands, Oceans, and Watershed, office of Water, EPA Headquarters regarding “EPA Review of 200 Section 303(d) Lists.”
9. EPA 2001b, November 19, 2001 memorandum from EPA Office of Water regarding *2002 Integrated Water Quality monitoring and Assessment Report Guidance*.
10. EPA 1997a, May 23, 1997 memorandum from Geoffrey H. Grubbs, Director, Assessment and Watershed Protection Division, Office of Water, EPA headquarters to FACA Workgroup Section 303(d) Listing Criteria re: Nonpoint Sources and Section 303(d) Listing Requirements.
11. EPA 1997a, August 27, 1997 memorandum from Robert H. Wayland III, Director, Office Wetlands, oceans, and Watershed, Office of Water, EPA Headquarters, to Water Division Directors, Regions I-X, and Directors, Great Water Body program, and Water Quality Branch

- chiefs, Regions I-X, regarding “National Clarifying Guidance for 1998 State and Territory Section 303(d) Listing Decisions.”
12. EPA 1997b, September, 1997 Guidance from Office of Water, Headquarters, UA EPA regarding *Guidelines for preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Supplement*, EPA-841-B-97-002B.
 13. EPA 1996, August 9, 1996 memorandum from Robert Perciasepe, Assistant Administrator regarding EPA Action on 1996 lists, “Priority Rankings and TMDL Targeting Plans Submitted by States Under Section 303(d) of the CWA.”
 14. EPA 1993, November 26, 1993 memorandum from Geoffrey Grubbs, Director, Assessment and Watershed Protection Division, Office of Water, EPA headquarters, to Water Quality Branch Chiefs, Regions I-X, and TMDL coordinators, Regions I-X, regarding “Guidance for 1994 Section 303(d) Lists.”
 15. EPA 1992a, July 24, 1992 Federal Register Notice, *40 CFR Parts 122, 123, 130*, revision of regulation, 57 Fed. Reg. 33040.
 16. EPA 1992b, August 13, 1992 memorandum from Geoffrey Grubbs, Director, Assessment and Watershed Protection Division, office of Water, EPA Headquarters, to EPA Water Quality Branch Chief’s, Regions I-X and TMDL Coordinators, Regions I-X, regarding “Supplemental Guidance on Section 303(d) Implementation.”
 17. EOA 1992c, October 30, 1992 memorandum from Geoffrey Grubbs, Director, Assessment and Watershed Protection Division, Office of Water, EPA Headquarters, to Water Quality Branch Chiefs, Regions I-X, regarding “Approval of 303(d) Lists, Promulgation Schedules/Procedures, Public Participation.”
 18. EPA 1991, April 1991. *Guidance for Water Quality Based Decisions: The TMDL Process*, App. C. EPA 440/4-91-001 U.S. Environmental protection Agency, Office of Water, Washington, DC.
 19. EPA 1985, January 11, 1985 Federal Register Notice, *40 CFR Parts 35 and 130*, Water Quality Planning and Management: Final Rule, 50 Fed. Reg. 1774
 20. EPA 1978, December 28, 1978 Federal Register Notice, Total Maximum Daily Loads Under Clean Water Act, finalizing EPA's identification of pollutants suitable for TMDL calculations, 43 Fed. Reg. 60662.