



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 6

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APR 14 2009

Ms. Teresa Marks  
Director  
Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

Dear Ms. Marks:

I would like to provide you with the Environmental Protection Agency's (EPA) findings concerning the review of additional supporting information related to several site-specific water quality standards revisions to Regulation No. 2, *Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas* originally submitted by your letters, dated September 17, 2007. These site-specific revisions were for three separate submissions: El Dorado Chemical Company, Great Lakes Chemical Corporation, and Lion Oil Company.

Your original September 17, 2007, letters included a request for EPA's approval of the removal of the domestic water supply designated uses, along with revised site-specific aquatic life criteria for chloride, sulfate, and total dissolved solids (TDS). EPA previously approved the removal of the domestic water supply uses from the waters associated with the El Dorado Chemical Company (EDCC) and four of five requested waterbodies for Great Lakes Chemical Corporation (GLCC), but was not able to approve the use removals associated with the fifth GLCC waterbody segment or the three waterbody segments associated with Lion Oil. In today's action, EPA approves the removal of the domestic water supply use for these four waters, given that they are not currently used as a source of supply for a public water system, nor are they being considered for such use and are intermittent in nature.

As you know, EPA was not able to approve the site-specific criteria revisions for the three separate submissions from EDCC, GLCC and Lion Oil as detailed in our January 3, 2008, letters to you. EPA was not able to take action on these submissions because they lacked specific supporting information necessary for EPA approval. EPA requested specific additional information for these provisions in the January 3, 2008 letter. Your August 14, 2008, response included some, but not all of the requested information. EPA staff requested the remaining supporting information via e-mail on November 11, 2008. Additional data were forwarded to EPA via email on November 19, 2008.


EPA again reviewed the submissions from EDCC, GLCC and Lion Oil taking into consideration the additional supporting information that was made available. Based on that subsequent review, EPA has determined that supporting documentation remains insufficient to demonstrate that the site-specific minerals criteria for the waterbodies

associated with EDCC, GLCC, and Lion Oil are appropriately protective of aquatic life. Therefore, EPA disapproves the site-specific chloride, sulfate, and TDS criteria for the EDCC, GLCC, and Lion Oil submissions. A detailed basis for EPA's determination and a description of the specific issues regarding the adequacy of these studies and supporting documentation are identified in the enclosed Record of Decision. As described in 40 CFR §131.21(c), new and revised standards do not go into effect for CWA purposes until approved by EPA. Therefore, the previously approved numeric criteria under Regulation No. 2 (April 23, 2004) remain in effect for CWA purposes for all waters identified in the EDCC, GLCC and Lion Oil submissions.

I would like to acknowledge the efforts of the Pollution Control and Ecology Commission, and particularly Arkansas Department of Environmental Quality (ADEQ). We encourage the Commission and ADEQ to work with the third parties, EDCC, GLCC, and Lion Oil, in responding to the issues identified here and detailed in the enclosed Record of Decision.

We look forward to the continuation of our work with you on these water quality standards revisions and encourage early coordination on any future proposed water quality standards revisions to facilitate EPA's review of State-adopted water quality standards submitted for approval. If you have any questions or concerns, please contact me at (214) 665-7101, or have your staff contact Russell Nelson at (214) 665-6646 or Matt Hubner at (214) 665-9736.

Sincerely yours,



Miguel I. Flores  
Director  
Water Quality Protection Division

Enclosure

cc: Steve Drown, Chief, Water Division, ADEQ  
Sarah Clem, Technical Assistance Manager, ADEQ

**RECORD OF DECISION:  
EPA APPROVAL AND DISAPPROVAL OF SITE-SPECIFIC REVISIONS  
TO THE  
ARKANSAS WATER QUALITY STANDARDS**

**Site Specific Domestic Water Supply Use Removal and Minerals Criteria Revisions for  
Great Lakes Chemical Company (GLCC), El Dorado Chemical Company (EDCC),  
and Lion Oil  
Union County, Arkansas**

**U.S. Environmental Protection Agency – Region 6**

**March 2009**

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**I. INTRODUCTION**

*Purpose*

As described in §303(c) of the Clean Water Act (CWA) and in the standards regulation (40 CFR §131.20), States and authorized Tribes have primary responsibility to develop and adopt water quality standards to protect their waters. Authority to approve or disapprove new and/or revised standards submitted to EPA for review has been delegated to the Water Quality Protection Division Director, in Region 6. Tribal or State water quality standards are not considered effective under the CWA until approved by EPA.<sup>1</sup>

The purpose of this record of decision is to provide the basis for the Environmental Protection Agency's (EPA) approval of domestic drinking water use removals and disapproval of site-specific water quality criteria revisions to Regulation No. 2: *Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas* adopted by the Arkansas Pollution Control and Ecology Commission (APC&EC) in Minute Order 07-18. The drinking water use removals and site-specific revisions for chloride, sulfate, and total dissolved solids (TDS) are associated with three separate submissions: El Dorado Chemical Company (EDCC), Great Lakes Chemical Corporation (GLCC) and Lion Oil Company.

*Chronology of Events*

August 31, 2006

Three individual third parties, EDCC, GLCC, and Lion Oil, filed a petition with the APC&EC to amend Regulation No. 2.

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<sup>1</sup> "Alaska rule" [*Federal Register*: April 27, 2000 (Volume 65, Number 82)]

- September 22, 2006 The APC&EC's Regulations Committee met to review the petition and recommended that the Commission institute a rule-making proceeding to consider adopting the proposed revisions to Regulation No. 2.
- September 22, 2006 The APC&EC accepted the Regulations Committee recommendation and initiated the rulemaking proceeding via Minute Order 06-37.
- September 27-28, 2006 Public notice of the proposed rule-making was published.
- November 13, 2006 Public hearing on the proposed rule-making was held in El Dorado, Arkansas.
- November 29, 2006 Public comment period ended on the proposed changes to Regulation No. 2.
- January 19, 2007 Responsiveness summary was filed with the APC&EC.
- June 22, 2007 Teresa Marks, Director, Arkansas Department of Environmental Quality (ADEQ), signed Minute Order 07-18 adopting changes to Regulation No. 2.
- September 17, 2007 Miguel I. Flores, Director, Water Quality Protection Division, EPA Region 6, received letter from Teresa Marks, Director, ADEQ, requesting EPA approval of the adopted revisions and transmitting the water quality standards submission package.
- November 9, 2007 EPA approves removal of domestic drinking water uses for EDCC and the majority for GLCC. No action is taken on all segments for Lion Oil and 1 for GLCC.
- January 3, 2008 EPA issues no action letter to Teresa Marks (ADEQ) concerning site specific criteria and drinking water use removals.
- August 14, 2008 Miguel I. Flores receives letter from Teresa Marks responding to the issues raised by EPA in the January 3, 2008 no action letter.
- November 11, 2008 EPA requests additional material not included in previous letter from Teresa Marks.
- November 19, 2008 ADEQ forwards additional materials to EPA staff.

***Background***

In separate letters dated August 17, 2007, from Teresa Marks, ADEQ, to Miguel Flores, EPA Region 6, ADEQ requested EPA approval of several site-specific water quality

standards revisions to Regulation No. 2 for twelve streams and multiple segments in the Gulf Coastal ecoregion of Arkansas. These streams are the receiving waterbodies for discharges from EDCC, GLCC and Lion Oil, in Union County, Arkansas.

The letter included a request for EPA approval of the removal of the domestic water supply designated uses for eleven of the twelve waterbodies associated with the facilities identified above, along with site-specific criteria for chloride, sulfate, and total dissolved solids (TDS) for all twelve waterbodies and segments. EPA took no action in relation to the site-specific minerals criteria for all waterbodies and for four waterbodies concerning drinking water use removal. This record of decision applies to the site-specific criteria revisions and remaining domestic water supply designated use removals for the waterbodies for which such action was requested. The general details of each request are addressed individually in the following text.

**Summary of Revised Provisions**

**A. El Dorado Chemical Company**

Table 1 below provides a detailed description of the four streams to which the site-specific minerals revisions apply for EDCC. EPA previously approved the removal of the domestic water supply use from UTB, UTA, Flat Creek, and Haynes Creek. Table 2 depicts the proposed site-specific criteria for chloride, sulfate, and TDS, for the four waterbodies.

**Table 1.** Description of stream segments for which the proposed site-specific criteria revisions apply.

Stream Segment Descriptions
Unnamed tributary to the unnamed tributary to Flat Creek (UTB) from the El Dorado Chemical Company outfall 001 discharge to the confluence with unnamed tributary of Flat Creek (UTA)
Unnamed tributary to Flat Creek (UTA) from the confluence of UTB to the confluence with Flat Creek
Flat Creek from the mouth of UTA tributary to the mouth of Haynes Creek
Haynes Creek from the confluence of Flat and Salt Creeks downstream to the confluence with Smackover Creek

**Table 2.** Proposed site-specific water quality criteria revisions for chloride, sulfate, and TDS, for four waterbodies submitted by ADEQ to EPA for review and approval.

Stream Segment Name	Chloride (mg/L)		Sulfate (mg/L)		TDS (mg/L)	
	Previous	Revised	Previous	Revised	Previous	Revised
UTB	14	23	31	125	123	475
UTA	14	16	31	80	123	315

Stream Segment Name	Chloride (mg/L)		Sulfate (mg/L)		TDS (mg/L)	
	Previous	Revised	Previous	Revised	Previous	Revised
Flat Creek	14	165	31	67	123	560
Haynes Creek	14	360	31	55	123	855

### B. Great Lakes Chemical Corporation

Table 3 below provides a detailed description of the six streams for which the proposed site-specific minerals revisions and drinking water use removal apply for GLCC. EPA previously approved the removal of domestic water supply use from UT002, UT004, UT003, and UTLCB-2. Bayou de Loutre was not approved for drinking water use removal and is addressed later in the document. Table 4 depicts the proposed site-specific criteria for chloride, sulfate, and TDS, for the six waterbodies.

**Table 3.** Description of stream segments for which the proposed site-specific criteria revisions and one drinking water use removal apply.

Stream Segment Descriptions
Unnamed tributary into which Great Lakes Chemical Corporation outfall 002 discharges (UT002) to the confluence with Bayou de Loutre
Unnamed tributary into which Great Lakes Chemical Corporation outfall 004 discharges (UT004) to the confluence with Bayou de Loutre
Bayou de Loutre from the mouth of Outfall 004 tributary downstream to the mouth of Gum Creek <sup>2</sup>
Unnamed tributary to an unnamed tributary of Little Cornie Bayou (UT003)
Unnamed tributary of Little Cornie Bayou (UTLCB-2) to Little Cornie Bayou
Little Cornie Bayou from the confluence of UTLCB-2 to the Arkansas/Louisiana State line <sup>3</sup>

**Table 4.** Proposed site-specific water quality criteria revisions for chloride, sulfate, and TDS, for six waterbodies submitted by ADEQ to EPA for review and approval.

Stream Segment Name	Chloride (mg/L)		Sulfate (mg/L)		TDS (mg/L)	
	Previous	Revised	Previous	Revised	Previous	Revised
UT002	14	65	31	35	123	141
UT004	14	239	--	--	123	324
Bayou de Loutre	250	278	--	--	--	--
UT003	14	538	31	35	123	519

<sup>2</sup> Bayou de Loutre – No action taken by EPA (January 3, 2008) on removal of domestic water use

<sup>3</sup> Little Cornie Bayou – Not identified for drinking water use removal



Stream Segment Name	Chloride (mg/L)		Sulfate (mg/L)		TDS (mg/L)	
	Previous	Revised	Previous	Revised	Previous	Revised
UTLCB-2	14	305	--	--	123	325
Little Cornie Bayou	200	215	20	25	--	--

**C. Lion Oil**

Table 5 below provides a detailed description of the three streams for which the proposed drinking water use removal apply for Lion Oil. EPA previously took no action in the removal of the domestic water supply use for Loutre Creek and two of the nine segments of Bayou de Loutre upstream of Gum Creek. Table 4 depicts the proposed site-specific criteria for chloride, sulfate, and TDS, for the six waterbodies.

**Table 5.** Description of stream segments for which the proposed domestic water supply designated use removals apply.

Stream Segment Descriptions
Loutre Creek from Highway 15 South to the confluence of Bayou de Loutre
Bayou de Loutre from Loutre Creek to the discharge for the City of El Dorado South facility*
Bayou de Loutre from the discharge for the City of El Dorado South downstream to the mouth of Gum Creek**

**Table 6.** Proposed site-specific water quality criteria revisions for chloride, sulfate, and TDS, for Loutre Creek and nine segments of Bayou de Loutre submitted by ADEQ to EPA for review and approval.

Stream Segment Name	Chloride (mg/L)		Sulfate (mg/L)		TDS (mg/L)	
	Previous	Revised	Previous	Revised	Previous	Revised
Loutre Creek	14	256	31	997	123	1756
Bayou de Loutre*	250	264	90	635	500	1236
Bayou de Loutre**	--	--	90	431	500	966
Bayou de Loutre <sup>4</sup>	--	--	90	345	750	780
Bayou de Loutre <sup>5</sup>	--	--	90	296	--	--
Bayou de Loutre <sup>6</sup>	--	--	90	263	--	--

<sup>4</sup> Bayou de Loutre – from the mouth of Gum Creek downstream to the mouth of Boggy Creek

<sup>5</sup> Bayou de Loutre – from the mouth of Boggy Creek downstream to the mouth of Hibank Creek

<sup>6</sup> Bayou de Loutre – from the mouth of Hibank Creek downstream to the mouth of Mill Creek

Stream Segment Name	Chloride (mg/L)		Sulfate (mg/L)		TDS (mg/L)	
	Previous	Revised	Previous	Revised	Previous	Revised
Bayou de Loutre <sup>7</sup>	--	--	90	237	--	--
Bayou de Loutre <sup>8</sup>	--	--	90	216	--	--
Bayou de Loutre <sup>9</sup>	--	--	90	198	--	--
Bayou de Loutre <sup>10</sup>	--	--	90	171	--	--

## II. REVISED PROVISIONS EPA IS DISAPPROVING

### *Site-Specific Criteria for Chloride, Sulfate, and TDS*

Supporting documentation remains insufficient to demonstrate that the site-specific minerals criteria for the waterbodies associated with EDCC, GLCC, and Lion Oil are appropriately protective of aquatic life. Although Section 3.6.2 – “Whole Effluent Toxicity (WET) Testing” of the August 17, 2007 submissions provided the results of outfall biomonitoring for the water flea and fathead minnow, it remains unclear what minerals concentrations (chloride, sulfate, and TDS) were associated with each of these tests and whether or not the minerals concentrations during WET testing were representative of the adopted site-specific minerals criteria under review for effluent receiving streams.

The evidence included in the reports and subsequent materials requested by EPA do not include a general evaluation or review of the site-specific criteria for associated waterbodies in light of the available scientific literature concerning the toxicity effects of chloride, sulfate, and TDS to aquatic organisms. Supporting documentation from the literature or other appropriate documentation is important for providing a clear demonstration that the proposed site-specific criteria are appropriately protective of the aquatic life uses (Gulf Coastal seasonal or perennial fishery) in these waterbodies. Such information may also be useful to supplement the biomonitoring information, especially if the minerals concentrations present during the biomonitoring testing referenced above are not available or were not representative of the adopted site-specific minerals criteria under review for receiving waterbodies (UTB - EDCC; UT002, UT003, UT004 - GLCC; and Loutre Creek - Lion Oil)

Literature (Mount and Gulley)<sup>11</sup> cited in ADEQ’s August 14, 2008 response, proposes that the development of the salinity/toxicity relationship (STR) model supports higher

<sup>7</sup> Bayou de Loutre – from the mouth of Mill Creek downstream to the mouth of Buckaloo Branch

<sup>8</sup> Bayou de Loutre – from the mouth of Buckaloo Branch downstream to the mouth of Bear Creek

<sup>9</sup> Bayou de Loutre – from the mouth of Bear Creek to the final segment of Bayou de Loutre

<sup>10</sup> Bayou de Loutre (Final Segment) to the Arkansas/Louisiana state line

<sup>11</sup> Mount, D.R. and D.D. Gulley. 1992. Development of a salinity/toxicity relationship to predict acute toxicity of saline waters to freshwater organisms. GRI-92/0301. Gas research Institute, Chicago, IL, USA

acute lethality concentrations than those proposed in the criteria. EPA's review of this study indicates lower concentrations of ions in combination can adversely affect sensitive aquatic species, yet other combinations may ameliorate such effects. Thus, the necessity for documentation and identification of specific mineral concentrations is critical to supporting that protection of aquatic life uses will be met by the proposed criteria.

EPA disapproves all proposed site-specific criteria revisions for chloride, sulfate, and TDS in all submissions on the grounds that current documentation provided by ADEQ does not clearly demonstrate adequate protection of aquatic life uses for the receiving and associated waterbodies. Under 40 CFR §131.21(c), new and revised standards do not go into effect for CWA purposes without EPA approval. EPA does not intend to propose or promulgate criteria for the previously identified waters. Therefore, previous approved numeric criteria under Regulation No. 2 (April 23, 2004) remain in effect.

If the State decides to pursue site-specific revisions for minerals in these waterbodies, adequate supporting scientific documentation must be provided to show that the Gulf Coastal seasonal or perennial fishery aquatic life uses will be protected. The previously requested mineral concentration data associated with outfall WET testing are necessary to support that effluent being tested reflect proposed criteria values. If these values are not available, use of STR modeling as well as background literature searches on ecoregion species' salinity tolerances would provide a minimal level of support to the revision.

### **III. REVISED PROVISIONS EPA IS APPROVING**

#### ***Domestic Water Supply Use Removals***

EPA previously took no action concerning the removal of domestic drinking water uses for the waterbodies listed above for GLCC and Lion Oil. Documentation, in the form of a letter from Arkansas Department of Health (ADH), showing that there were no current or proposed public drinking water considerations for these waterbodies was missing or inadequate and therefore did not support the revision.

Two letters, dated July 24, 2006 and May 12, 2008, from ADH were submitted by ADEQ on EPA's request subsequent to the study report. The letters respectively state that Bayou de Loutre upstream of Gum Creek and Loutre Creek are not currently used as a source of supply for a public water system, nor are they being considered for such use.

In addition, the UAA study cites two reasons (see 40 CFR §131.10(g)(2) and (5)) for why the domestic water supply use is not an attainable use in Loutre Creek and the three segments of Bayou de Loutre. Specifically, the report cites the intermittent nature of these streams and lack of consistent base flow, along with the presence of shallow pools and run areas that would not support the intake and storage areas necessary for the development of a domestic water supply system.

EPA agrees with the conclusions of the study and approves the removal of the domestic water supply use from Bayou de Loutre from the confluence of UT004 downstream to the confluence of Loutre Creek for the GLCC submission. For Lion Oil, EPA approves the removal of the domestic water supply use from Loutre Creek and two segments of Bayou de Loutre between the confluence with Loutre Creek and confluence with Gum Creek.



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