UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

AUG 3 1 2011

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

RE: Site-specific Water Quality Standards Revisions for Unnamed Tributary to Flat Creek, Union County, Arkansas

Dear Ms. Marks:

This is in response to your letter dated February 16, 2011, requesting review and approval of several site-specific water quality standards revisions to Regulation No. 2, *Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas* for two stream segments in the Gulf Coastal ecoregion of Arkansas, the unnamed tributary to Flat Creek (UTA and UTB). These streams are also the receiving waterbodies for the discharge from the El Dorado Chemical Company (EDCC), in Union County, Arkansas.

Your letter requested for U.S. Environmental Protection Agency (EPA) approval of revised site-specific criteria for chloride, sulfate and total dissolved solids (TDS) for the two reaches. EPA was not able to take action on this submission because it lacked specific supporting information necessary for EPA approval. A letter dated April 29, 2011 from EPA to ADEQ outlined additional information that was necessary for EPA to take action on the submission. In June of 2011, your office provided a response from EDCC to our letter providing additional information.

EPA again reviewed the submissions taking into consideration the additional information that was provided. 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 are appropriately protective of aquatic life. Therefore, EPA disapproves the site-specific chloride, sulfate, and TDS criteria for the EDCC submission. 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 Technical Support Document. 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 UTA and UTB.

I would like to acknowledge the efforts of the Pollution Control and Ecology Commission, and particularly ADEQ, in the development of these revised standards. We look forward to continue working with you on this water quality standards revision and encourage

early and up-front coordination on any future revisions to facilitate EPA's review of State-adopted water quality standards revisions submitted for approval. If you have any questions or concerns, please contact me at (214) 665-7101, or have your staff contact Matt Hubner at (214) 665-9736.

Sincerely,

Miguel I. Flores
Director
Water Quality Protection Division

Enclosure

cc: Steve Drown, Chief, Water Division, Arkansas Department of Environmental Quality
Sarah Clem, Manager, Water Division, Arkansas Department of Environmental Quality

Enclosure

TECHNICAL SUPPORT DOCUMENT
EPA DISAPPROVAL OF SITE-SPECIFIC REVISIONS TO THE ARKANSAS WATER QUALITY STANDARDS, REGULATION NO. 2

SITE SPECIFIC MINERALS CRITERIA REVISIONS FOR EL DORADO CHEMICAL COMPANY (EDCC) UNION COUNTY, ARKANSAS

U.S. ENVIRONMENTAL PROTECTION AGENCY – REGION 6

AUGUST 2011

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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.[1]

The purpose of this technical support document is to provide the basis for the Environmental Protection Agency's (EPA) 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 10-42. The site-specific revisions for chloride, sulfate, and total dissolved solids (TDS) were proposed via a third party rulemaking initiated by El Dorado Chemical Company (EDCC or ELCC). The proposed criteria pertain to two segments of an unnamed tributary (labeled UTA & UTB) to Flat Creek.

Chronology of Events

April, 14 2009	EPA disapproved site-specific minerals criteria revisions for four segments in UTA, UTB, Flat Creek, & Haynes Creek citing insufficient supporting evidence.
April 29, 2009	EDCC, their contractors, the Arkansas Department of Environmental Quality (ADEQ), and EPA discuss by teleconference options for the facility to provide additional supporting information in a future attempt at rulemaking.
June 9, 2009	EDCC contractors submit a study plan to ADEQ and EPA for review.
July 31, 2009	EPA provides comments to ADEQ on EDCC study plan.
September 29, 2009	EDCC contractors submit final study to ADEQ and EPA for review.
March 3, 2010	EDCC contractors submit responses to EPA comments from July 31, 2009 correspondence.

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

July 7, 2010	EDCC submits a petition to the APC&EC to re-open third-party rulemaking to amend regulation No. 2, rescinding revised criteria for Flat & Haynes Creeks
July 23, 2010	Under minute order 10-27, the APC&EC accepted the Regulations Committee recommendation and initiated rulemaking.
July 28 & 29, 2010	ADEQ publishes notice of proposed third-party rulemaking and public hearing; opening public comment period.
September 13, 2010	A public hearing was held in El Dorado, Arkansas; no oral comments received.
September 27, 2010	Public comment period closes with no written comments received.
December 3, 2010	Teresa Marks, Director, Arkansas Department of Environmental Quality (ADEQ), signed Minute Order 10-42 adopting changes to Regulation No. 2.
February 16, 2011	Miguel I. Flores, Director, Water Quality Protection Division, EPA Region 6, received letter from Teresa Marks requesting EPA approval of the adopted revisions and transmitting the water quality standards submission package.
April 29, 2011	EPA issues no action letter to Teresa Marks (ADEQ) requesting additional information from the facility regarding sublethal toxicity and other issues.
June 2, 2011	ADEQ forwards letter from EDCC responding to EPA concerns in previous no action letter; declining to discuss sublethal effects in Flat and Haynes Creeks.
August 2011	EPA disapproves site-specific criteria

Background

In a letter dated February 16, 2011, from Teresa Marks, ADEQ, to Miguel Flores, EPA Region 6, ADEQ requested EPA approval of site-specific water quality standards revisions to Regulation No. 2 for two stream segments, UTA and UTB, in the Gulf Coastal ecoregion (GCER) of Arkansas. Additionally, the revisions of site-specific minerals criteria for the downstream Flat and Haynes Creeks from the previous rulemaking were rescinded. UTA and UTB are the receiving waterbodies for discharges from EDCC, in Union County, Arkansas.

The letter included a request for EPA approval of the revision of site-specific criteria for chloride, sulfate, and total dissolved solids (TDS) in both streams. This record of decision applies to the site-specific criteria revisions for the waterbodies for which such action was requested. In April 2011, EPA took no action on the site-specific minerals criteria revision for UTA and UTB due to inadequate supporting documentation to make a final determination. The specific details of the current action are addressed in the following text.

Summary of Revised Provisions

El Dorado Chemical Company

Table 1 below provides a detailed description of the four streams to which the site-specific minerals revisions originally applied for EDCC. In the petition to re-open rulemaking, the site-specific revisions to Flat and Haynes Creeks were rescinded. 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.[2]

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.[3]

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
Flat Creek	14	165	31	67	123	560
Haynes Creek	14	360	31	55	123	855

[2] Site-specific criteria for Flat and Haynes Creeks rescinded in minute order 10-42.
[3] Site-specific criteria for Flat and Haynes Creeks rescinded in minute order 10-42.

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 adopted by Arkansas for UTA and UTB are appropriately protective of downstream aquatic life in Flat and Haynes Creeks. The following section outlines EPA's general concerns with the supplemental study and its reasons for disapproval.

Following the April 2009 disapproval of site specific minerals criteria for EDCC, the facility, their contractors, ADEQ, and EPA discussed, in a teleconference, additional work and information that the facility could conduct and provide to support the proposed minerals concentrations. It was determined that: 1. evaluation of existing literature to support the conclusions of the study, 2. completion of modeling using the Gas Research Institute (GRI) salinity-toxicity ratio (STR) modeling program, and, most importantly, 3. conducting spiked toxicity tests to simulate proposed minerals concentrations and evaluate their protectiveness, would serve as a weight of evidence to ensure that the aquatic life criteria are appropriately protective.

In February of 2011, EPA received the final submission of the EDCC supplemental report following Arkansas's adoption of the criteria[4]. The report contained the additional information identified in the April 2009 conference call. Most notably, the supplemental toxicity tests and data provided in the study indicated that there were sub-lethal reproductive effects to the water flea, *Ceriodaphnia dubia*, at maximum proposed concentrations for Flat and Haynes Creeks. No acute or sub-lethal effects were observed for UTA and UTB.

In the 2010 re-opening of the rulemaking, the proposed criteria for Flat and Haynes Creeks were rescinded; however, because the upstream criteria (for UTA and UTB) were not modified from the previous proposal, EPA was mandated by 40 CFR §131.10(b) to evaluate the protectiveness of proposed criteria on the most sensitive downstream use; the GCER aquatic life use. This included the evaluation of the sub-lethal effects in Flat and Haynes Creeks based on the data and information submitted in the final supplemental report.

EPA strongly believes that a weight of evidence approach is necessary to show that the most sensitive uses are being protected by proposed criteria, especially for minerals criteria where protective concentrations can differ greatly from one geographic location to another and with varying in-stream ionic compositions. Following this approach, EPA found that supporting information in the habitat assessment and biological sampling presented in the original study indicated that there are impairments to UTA and UTB, as well as Flat Creek when compared to least-impacted ecoregion reference streams. EDCC's 2006 study also concluded that in comparison to least disturbed ecoregion reference streams the majority of the study reaches were found to be impaired for aquatic

[4] GBMc. 2009. El Dorado Chemical Company Aquatic Life Supplemental Report Dissolved Minerals Rulemaking.

life[5]. In response, EDCC chose to examine impacted reference reaches that they labeled as "developed" in order to show that equivalent aquatic life uses are being maintained in other streams outside of the EDCC influence. EPA does not agree that using impacted reference reaches supports the conclusion that current minerals loadings are maintaining a fully functional GCER aquatic life use.

Additional information not presented in the study; such as the 2002 ELCC tributary total maximum daily load (TMDL)[6], indentify the EDCC discharge as the primary cause of impairment for UTA and UTB (ELCC tributary). The TMDL indentifies two other point sources (City of Norphlet and Wildwood Trailer Park) to ELCC tributary that contribute minerals but were not factored in to the mass balance calculations nor discussed in either report.

EDCC's supplemental report maintains that the sub-lethal effects, which were observed in Flat and Haynes Creeks, are the result of legacy oil and gas activities. The 2003 Flat Creek TMDL[7], cited in the study, does identify non-point sources as the primary cause for impairment in upper Flat Creek; however, the ELCC tributary TMDL indicates that the combined overall reduction of minerals in ELCC tributary and Upper Flat Creek are intended to address to the impairments downstream of the confluence. Data submitted by EDCC in the 2006 study has shown that they have reduced the concentration of minerals in their effluent in past years; however, neither of the reports were able to adequately show that the cumulative effects of minerals concentrations in UTA and UTB in combination with those in upper Flat Creek are not contributing to the sub-lethal concentrations exhibited in the laboratory toxicity tests.

Finally, it was noted in the ELCC tributary TMDL that in the early 90's EDCC attempted to revise their minerals criteria unsuccessfully[8]. If a study was completed at the time, it may have provided additional important data. As with the ELCC TMDL, this information is a relevant part of the background and history that should have been identified in either of the previous reports.

EPA disapproves the proposed site-specific criteria revisions for chloride, sulfate, and TDS in UTA and UTB on the grounds information supporting the revised criteria does not clearly demonstrate adequate protection of aquatic life uses for the receiving and associated waterbodies. EPA cites the following specific issues to support its finding:

- The revised criteria are not shown to be conclusively protective of either the in-stream or downstream designated uses (40 CFR 131.11(a)).
    - EDCC provided no adequate supporting documentation to demonstrate that the revised criteria are protective of the GCER aquatic life use.

[5] GBMc. 2006. El Dorado Chemical Company Section 2.306 Site Specific Water Quality Study for Chloride, Sulfate, and TDS.
[6] FTN. 2002. TMDLs For Chloride, Sulfate, TDS, and Ammonia in the ELCC Tributary, Arkansas.
[7] FTN. 2002. TMDLs for Chloride, Sulfate, and TDS in Flat Creek and Salt Creek, Arkansas.
[8] FTN. 1991. Surface Water Quality Study for El Dorado Chemical Company. Prepared by FTN for El Dorado Chemical Company.

  - Also, toxicity tests demonstrated sub-lethal effects to reproduction in the downstream waterbodies.
- Revised criteria may not provide for the attainment of the downstream minerals water quality standards (40 CFR 131.10(b)).
  - EDCC did not consider the downstream minerals water quality standards when calculating the revised criteria. Therefore, the revised criteria may not provide for the attainment of the downstream standards.
- The method used to derive the revised criteria is not scientifically defensible (40 CFR 131.11(a)).
  - EDCC used a simple mass-balance equation to derive the revised criteria, which alone is not a scientifically defensible method for deriving aquatic life criteria. EDCC should have taken the following into account when deriving the criteria:
    - Stream low flow conditions
    - Results from properly conducted toxicity tests
    - The downstream water quality standards
    - Facility design flow capacity, and
    - Inputs from other point sources in the watershed
- The weight of supporting evidence was flawed in that:
  - The study omitted relevant sources of information including the 1991 proposed criteria revision and ELCC TMDL.
  - Results of biological sampling in comparison to GCER reference streams indicate impairment of biota.

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.

Should the facility and the State decide to pursue revisions for minerals criteria in these waterbodies, adequate supporting scientific documentation must be provided to demonstrate that the Gulf Coastal seasonal or perennial fishery aquatic life uses will be protected. However, if the evidence does not support the revision of site-specific criteria, an option would be to conduct a full use attainability analysis (UAA) to determine an appropriate level of aquatic life use for an area that has been historically impacted by industry.