BAYOU DE LOUTRE –
SECTION 2.306 SITE SPECIFIC WATER QUALITY STUDY
SUPPLEMENTAL DOCUMENTATION
DISSOLVED MINERAL CRITERIA DEVELOPMENT

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1.0 OVERVIEW

Pursuant to Arkansas Pollution Control and Ecology Commission (Commission) Regulation No. 2.306, Lion Oil Company (Lion Oil) submits this Site Specific Water Quality Study (Bayou de Loutre SSC) to define and characterize the appropriate dissolved minerals (chloride, sulfate, and total dissolved solids (TDS)) criteria for Bayou de Loutre, located in Union County near the City of El Dorado, Arkansas (Figure 1). Lion Oil discharges treated wastewater to Loutre Creek, which is a tributary to Bayou de Loutre.

In 2007, the Commission approved revisions to the dissolved minerals criteria for Loutre Creek and Bayou de Loutre. The 2007 criteria are based on the October 3, 2006 Loutre Creek-Section 2.306 Site Specific Water Quality Study (2006 Study, GBM^{c}, 2006) and are codified in Regulation No. 2. However, in 2009, the U.S. Environmental Protection Agency (EPA) issued a Record of Decision disapproving these 2007 criteria and requested additional information before it would approve them. Subsequently, Lion Oil undertook significant efforts to develop the additional information for EPA.

The Bayou de Loutre SSC summarizes this additional information and recommends that the Commission adopt revised dissolved minerals criteria for Bayou de Loutre based on the additional information and the 2006 Study. Under Regulation 2.303, Lion Oil has also prepared a Use Attainability Analysis for Loutre Creek (Loutre Creek UAA) which proposes that the fishery use designation for Loutre Creek be changed to a new subcategory designated as a Limited Gulf Coastal Fishery, and proposes new selenium and dissolved minerals criteria that are protective of that fishery. The UAA also contains information demonstrating that the proposed dissolved minerals criteria for Loutre Creek would be protective of the designated fishery use that applies downstream in Bayou de Loutre.[1]

[1] Lion Oil proposes new dissolved minerals criteria for Loutre Creek in the Loutre Creek UAA. If the Commission decides not to create a subcategory of the fishery for Loutre Creek, however, then it is recommended that the Commission amend the dissolved minerals criteria for Loutre Creek pursuant to Regulation 2.306 and based upon the information in the Loutre Creek UAA and this Bayou de Loutre SSC and the attachments thereto.

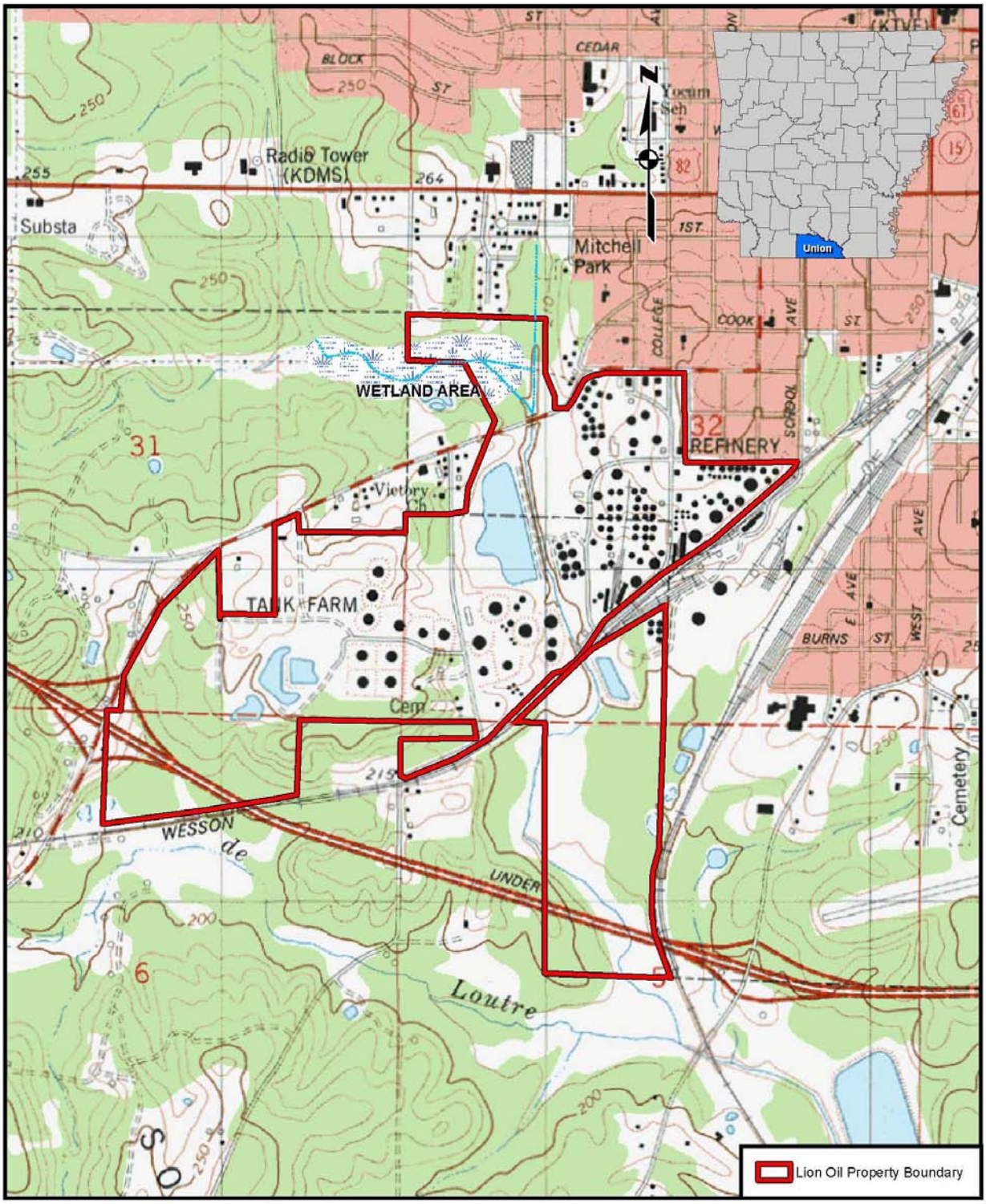

Figure 1. Location of Lion Oil, Loutre Creek and Bayou de Loutre.

Although the criteria previously approved by the Commission for both Loutre Creek and Bayou de Loutre are scientifically justified, Lion Oil is now proposing more stringent criteria because it believes it can comply with the more stringent criteria. Over the past seven years, Lion Oil has reduced the mass of TDS and sulfates in its wastewater effluent by 20% and 32%, respectively. Further, Lion Oil has developed a strategy to continue to significantly reduce TDS and sulfates in its wastewater by adding SO_2 reducing catalyst additives to its fluid catalytic cracking unit regenerator. Through this process, Lion Oil expects an additional 20% reduction in TDS and 30% reduction in sulfates in the final effluent.

The bulk of the documentation supporting the proposed revisions to the dissolved minerals criteria is included in the 2006 Study and the Loutre Creek UAA. This Bayou de Loutre SSC encloses and relies on the 2006 Study and the Loutre Creek UAA to support the findings and recommendations herein. This Bayou de Loutre SSC also includes the following information to support the findings and recommendations:

- Section 2: Background on Bayou de Loutre and Lion Oil,
- Section 3: Objectives of the Bayou de Loutre SSC,
- Section 4: Significant findings, recommendations for revised criteria, and method of deriving criteria,
- Section 5: Documentation and technical basis for revised criteria, and
- Section 6 : References

2.0 BACKGROUND ON BAYOU DE LOUTRE AND LION OIL

2.1 Bayou de Loutre

Bayou de Loutre watershed originates west of El Dorado, Arkansas and meanders to the southeast through Union County, eventually flowing into Louisiana just east of Junction City, Arkansas. The watershed is less than 5 mi^2 at the mouth of Loutre Creek draining the southwest portion of the City of El Dorado (Figure 1). Collectively Loutre Creek and Bayou de Loutre drain a combined watershed area of less than 10 square miles at the mouth of Loutre Creek. Currently, the fishery for Bayou de Loutre is designated as a Typical Gulf Coastal Fishery in Regulation No. 2. Due to its location in the oil, gas and brine producing area of south Arkansas, the Bayou de Loutre watershed is heavily industrialized with numerous NPDES dischargers. The dissolved minerals criteria for Bayou de Loutre vary depending on the location.

2.2 Background on Lion Oil

The Lion Oil refinery is located in El Dorado, Arkansas, Union County. An oil refinery has operated at the site since 1922 (Figure 1.2) and discharged treated wastewater to Loutre Creek during that 90 year period. Current refinery capacity is approximately 85,000 barrels per day.

Lion Oil discharges treated wastewater to Loutre Creek through NPDES Outfall 001 (NPDES No. AR000647). Lion Oil has also prepared and implements a Storm Water Pollution Prevention Plan (SWPPP) to reduce pollutant loadings from facility stormwater runoff to the Creek. In addition to implementing measures under the SWPPP, Lion Oil recently completed a facility wide Stormwater Segregation Project at a cost of $14,000,000 with the goal of eliminating the potential for contaminated stormwater to be discharged to the Creek. Lion Oil maintains a Spill Prevention, Control, and Countermeasure (SPCC) Plan for oil spill prevention, preparedness, and response to prevent oil spills. Lion Oil is also contributing to the restoration of the Loutre Creek watershed by remediating two lagoons on its property.

During Lion Oil's 2004 NPDES permit renewal, permit limits at Outfall 001 were established for sulfate (SO_4 at 68mg/L, monthly average and 102 mg/L daily maximum) and for total dissolved solids (TDS at 207 mg/L monthly average and 310 mg/L daily maximum). These limits were based upon the water quality standards applicable to Loutre Creek. Under the permit, these limits went into effect in 2007.

A significant portion of the dissolved minerals loadings in the current treated wastewater discharge originates from Lion Oil's air pollution control equipment. In 2003, Lion Oil entered into a Consent Decree with EPA and ADEQ, which required Lion Oil to install a wet gas scrubber at the refinery to reduce air emissions of SO_2. The scrubber was installed on the refinery's Fluid Catalytic Cracking Unit in March 2004. The scrubber converts SO_2 to sodium sulfate in a water solution. Although this water is treated along with other facility wastewater, the treatment is not designed to remove dissolved minerals such as sodium sulfate and, even in 2013, there is no treatment technology available for the removal of dissolved minerals that is practical or could be timely installed. The limits of available treatment technology are discussed more fully in Section 8 of the UAA, which is incorporated herein by reference.

To address dissolved minerals in the discharge, Lion Oil completed a third party rulemaking in 2007 in accordance with Regulation 2.306 (APCEC, 2007) and the ADEQ dissolved minerals implementation strategy as provided in ADEQ's Continuous Planning Process (ADEQ, 2000). The third party rulemaking resulted in the Commission approving revised dissolved minerals criteria. However, EPA subsequently disapproved the criteria and therefore, they cannot be used in establishing new NPDES permit limits for Lion Oil's discharge to Loutre Creek. In response to EPA's disapproval, additional data has been developed for Loutre Creek and Bayou de Loutre and is summarized in Section 5 below in support of the dissolved minerals criteria now proposed for adoption.

Since before the time dissolved minerals limits were added to Lion Oil's NPDES permit, Lion Oil has undertaken significant efforts to investigate technologies and alternatives to meet these limits. At this time, Lion Oil has joined with other NPDES permit holders in the region to construct a pipeline to discharge to the Ouachita River; this new discharge location will enable Lion Oil to meet its permit limits for the Ouachita River. However, without the proposed changes to the criteria discussed herein, Lion Oil will not be able to meet its permit limits for its discharge to Loutre Creek.

3.0 OBJECTIVES OF THE BAYOU DE LOUTRE SSC

The objectives of the Bayou de Loutre SSC are to:

- Summarize the information developed since the 2006 Study (which was used to support the approval of the dissolved minerals criteria in 2007). This information evaluates and supports the revised dissolved minerals criteria for Bayou de Loutre.
- Highlight the significant findings and recommendations to support a third party rulemaking to adopt site-specific water quality criteria for dissolved minerals that:
  - reflect the historic levels of in stream concentrations of dissolved minerals in Bayou de Loutre and the expected reductions of these concentrations by adding SO_2 reducing catalyst additives to Lion Oil's fluid catalytic cracking unit regenerator, and
  - are shown to support the biotic communities that maintain the Typical Gulf Coastal Fishery and other designated uses for Bayou de Loutre.

4.0 SIGNIFICANT FINDINGS AND RECOMMENDATIONS FOR REVISED DISSOLVED MINERALS CRITERIA

4.1 Significant Findings

The following findings are based on: (1) the Loutre Creek UAA; (2) the documentation relied on by the Commission to approve the revised dissolved minerals criteria for Loutre Creek and Bayou de Loutre in 2007; and (3) the documentation developed after that approval decision as requested by EPA, including the Aquatic Life Supplemental Report on Dissolved Minerals Rulemaking. Collectively, this documentation demonstrates that the dissolved minerals criteria approved by the Commission in 2007 and the more stringent criteria proposed in this Bayou de Loutre SSC are both supportive of a Typical Gulf Coastal Fishery in Bayou de Loutre.

General Findings

1. The Lion Oil refinery is located in El Dorado, Arkansas, Union County. An oil refinery has operated at the site since 1922. Lion Oil (and the prior owners) have discharged treated wastewater to Loutre Creek for nearly 90 years.
2. Lion Oil discharges treated waste water to Loutre Creek under NPDES permit AR0000647. Lion Oil is the only NPDES permitted discharge to Loutre Creek. The facility's process wastewater discharge point to Loutre Creek is known as Outfall 001. The facility certifies that it maintains a Storm Water Pollution Prevention Plan and a Spill Prevention Control and Countermeasure Plan that limit non-point source contributions from the Lion Oil facility.
3. The NPDES permit limitations for dissolved minerals are based on the water quality criteria for Loutre Creek, which are referred to as ecoregion reference criteria. These criteria were derived from a study of the water quality conditions in least-disturbed streams in the Gulf Coastal Ecoregion of Arkansas.
4. Process and air emission control equipment have been added to the Lion Oil facility in response to a Consent Decree jointly signed by ADEQ and EPA to control air emissions. The air emission control equipment has been responsible for the recent increase in sulfates and TDS in the treated wastewater discharged through Outfall 001 into Loutre Creek and then transported downstream into Bayou de Loutre. As a result, the

discharge from Outfall 001 has exceeded the NPDES permit limitations for total sulfate and TDS.

5. There is no reasonably available treatment known that would reduce dissolved minerals in the discharge sufficiently to comply with Lion Oil's NPDES permit limits. After construction of the joint pipeline (discussed in the UAA), Lion Oil will be able to meet the permit limits that apply to its outfall to the Ouachita River, but not the limits that apply to its outfall on Loutre Creek.
6. Although future discharges through the current Outfall 001 will be greatly reduced once the Ouachita River pipeline is completed, there remains a need to maintain a permitted outfall to Loutre Creek.
7. The Loutre Creek UAA recommended revisions to the fisheries use designation for Loutre Creek and the dissolved minerals criteria for Loutre Creek and contains information that supports revisions to the dissolved minerals criteria for Bayou de Loutre.
8. In 2007, the Commission adopted dissolved minerals criteria that would be protective of a Typical Gulf Coastal Fishery in Bayou de Loutre. This Bayou de Loutre SSC proposes more stringent dissolved minerals criteria, which are also protective of a Typical Gulf Coastal Fishery. Modification of the dissolved mineral criteria for Bayou de Loutre will not preclude the attainment of the designated uses for that waterbody, and therefore, this SSC does not request a change in the use designation for Bayou de Loutre.
9. Artificial matrix whole effluent toxicity (WET) testing completed in 2012 demonstrates that dissolved minerals concentrations consistent with the proposed criteria for Loutre Creek passed all WET testing endpoints. The concentrations of dissolved minerals did not elicit either lethal or sub-lethal effects. The criteria developed for Bayou de Loutre and discussed in this Bayou de Loutre SSC are more stringent (lower in concentration) than those developed for Loutre Creek, so the Bayou de Loutre criteria also do not have such effects. These WET tests indicate that the proposed dissolved minerals criteria will not result in lethal or sub-lethal effects in Loutre Creek or Bayou de Loutre and will maintain the designated uses of these receiving streams.

Findings from Supplemental Report and Analysis

10. The existing scientific literature supports that the effect of dissolved minerals in waters on aquatic life is widely variable depending on the chemical composition of the dissolved minerals complex. The dissolved minerals criteria approved in 2007 are protective of the instream aquatic life use of Bayou de Loutre.
11. The criteria approved in 2007 do not have toxic effects on the fishery in Bayou de Loutre as demonstrated by:
    a. the comparative analysis of the results of whole effluent toxicity (WET) testing performed on the Outfall 001 effluent between November 2009 and October 2010 and the concentration of dissolved minerals measured in Loutre Creek during the same period (this analysis was requested by ADEQ and EPA);
    b. the statistical analyses of the results of WET testing on the Outfall 001 effluent during the above period that found no statistical correlation between the levels of dissolved minerals in the effluent and the WET test results; and
    c. the lack of toxicity of the approved criteria as predicted using the GRI STR modeling, even when modeling was completed at twice the approved criteria.
12. The criteria approved in 2007 are more stringent than the criteria the Commission and EPA approved for other stream segments in Arkansas and more stringent than criteria that have been approved in other states in EPA Region 6 and across the nation.
13. The criteria now proposed for approval are more stringent than the criteria approved by the Commission in 2007. For Loutre Creek, the proposed criteria are lower (more stringent) than the 2007 criteria by approximately 6% for chloride, 33% for sulfate, and 30% for TDS.
14. The proposed criteria are protective and will maintain the designated fishery use of Bayou de Loutre (a Typical Gulf Coastal Fishery) as demonstrated in the aquatic life field study submitted as part of the Loutre Creek UAA and the 2006 Study.
15. The proposed dissolved minerals criteria will not preclude the attainment of other designated and attainable uses for Bayou de Loutre (primary contact recreation, secondary contact recreation, industrial water supply, and agricultural water supply).

4.2 Recommendations

Based on the above findings, the following action is recommended:

Adoption of dissolved minerals criteria: modify the water quality criteria for dissolved minerals for the nine individual stream segments in Bayou de Loutre as summarized in Table 1 below and as depicted in Figure 2.

The proposed changes to the criteria shown below are in relation to the criteria approved by the Commission in 2007. These proposed criteria are only for Bayou de Loutre, but are calculated based on the historical in-stream concentrations of dissolved minerals in Loutre Creek and the estimated reduction in dissolved minerals in Lion Oil's discharge following implementation of the SO_2 reducing catalyst additives to Lion Oil's Fluid Catalytic Cracking Unit. These proposed dissolved minerals criteria are lower (more stringent) for each successive downstream reach in Bayou de Loutre because the volume of water in Bayou de Loutre increases downstream. Hence, each downstream reach reflects less concentrated (more stringent) criteria as compared to the reach immediately above it.

4.3 Mass Balance Dissolved Minerals Calculation

The method of calculating the dissolved minerals criteria in Bayou de Loutre is explained in more detail in the 2006 Study and Section 5.6.2 of the Loutre Creek UAA. As discussed in the Study and the UAA, the following mass balance equation was used to calculate in-stream waste concentrations (IWC) for chloride, sulfate, and TDS:

$$IWC = [(Qb \times Cb) + (Qe \times Ce)] / (Qb + Qe)$$

Where:

- Qb = The background flow of the receiving streams entering Bayou de Loutre
- Cb = The background concentration of chloride, sulfate, or TDS in the receiving streams flowing into Bayou de Loutre (the ecoregion default concentrations) from tributaries without discharges and reported concentrations for those segments with permitted discharges (e.g. Boggy Creek and Gum Creek)
- Qe = The flow of the upstream segment
- Ce = The dissolved minerals concentration of the upstream segment.

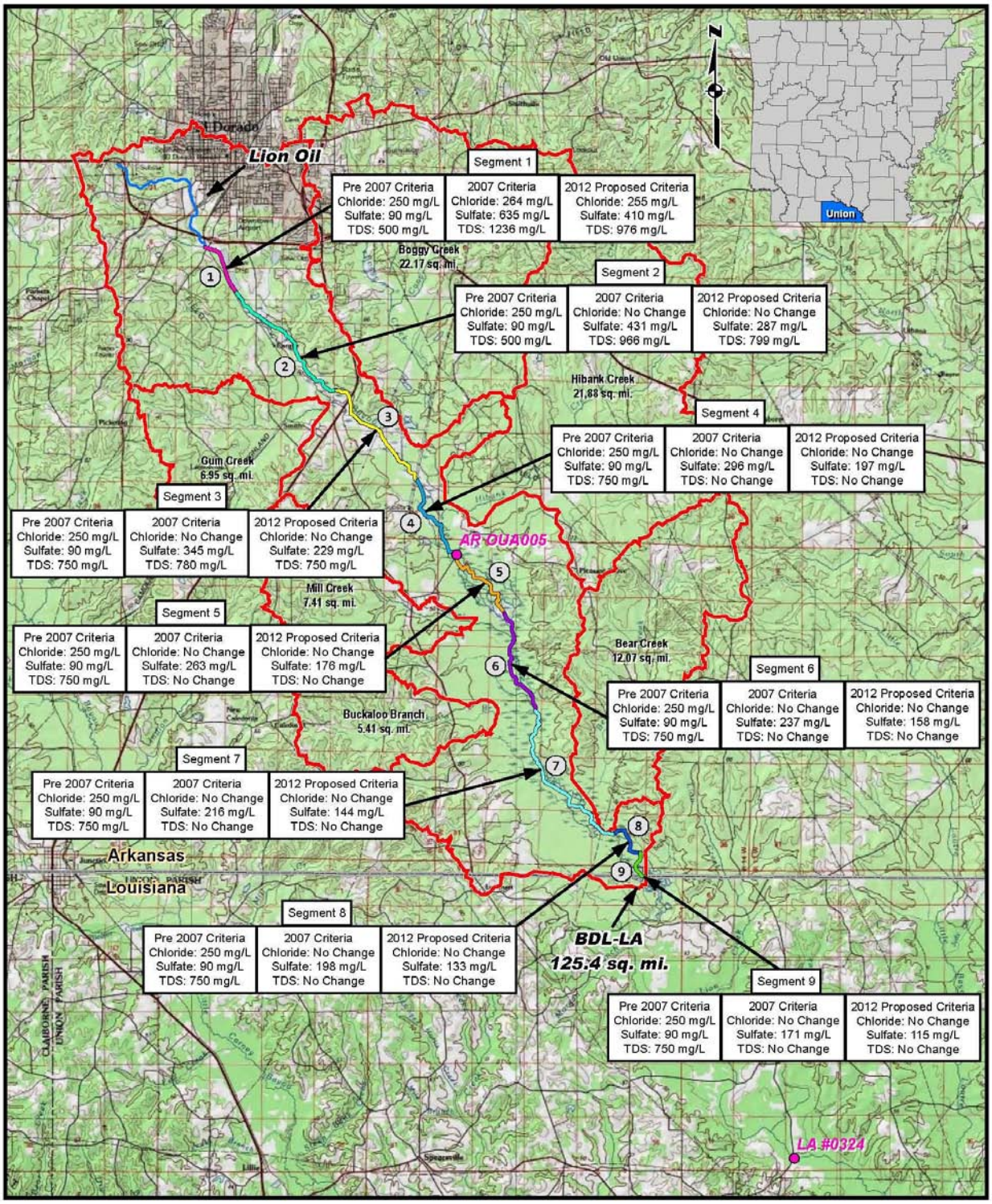

Figure 2. Existing and proposed dissolved mineral criteria for stream segments in Bayou de Loutre Watershed.

This approach to calculating dissolved minerals criteria is consistent with the procedure for evaluating in-stream concentrations and developing permit limits for dissolved minerals, which can be found in *ADEQ Discharge Permit, Toxic Control Implementation Procedure* in Arkansas' 2000 Continuing Planning Process (CPP) (ADEQ, 2000). Note that when developing the proposed criteria, the values used in the above equation for the background concentrations in the downstream tributaries to Bayou de Loutre were chloride (5 mg/L), sulfate (13 mg/L), and TDS (67 mg/L). These background values are listed in the CPP in Attachment XII, *Mineral Permitting Strategy*, for streams in the Gulf Coastal Plain with a 7Q-10 of less than 100 cfs. The critical flow used for each tributary to Bayou de Loutre was 4 cfs, as defined in Regulation No. 2.

Table 1. Proposed water quality standards modifications.

Segment 1: Bayou de Loutre – from Loutre Creek to the discharge for the City of El Dorado South facility
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride from 264 mg/L to 255 mg/L Sulfate from 635 mg/L to 410 mg/L TDS from 1236 mg/L to 976 mg/L Selenium: NO CHANGE
Segment 2: Bayou de Loutre – from the discharge from the City of El Dorado-South downstream to the mouth of Gum Creek
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride : NO CHANGE Sulfate from 431 mg/L to 287 mg/L TDS from 966 mg/L to 799 mg/L Selenium: NO CHANGE

Segment 3: Bayou de Loutre – from the mouth of Gum Creek downstream to the mouth of Boggy Creek
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride: NO CHANGE Sulfate from 345 mg/L to 229 mg/L TDS from 780 mg/L to 750mg/L Selenium: NO CHANGE
Segment 4: Bayou de Loutre – from the mouth of Boggy Creek downstream to the mouth of Hibank Creek
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride: NO CHANGE Sulfate from 296 mg/L to 197 mg/L TDS: NO CHANGE Selenium: NO CHANGE
Segment 5: Bayou de Loutre – from the mouth of Hibank Creek downstream to the mouth of Mill Creek
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride: NO CHANGE Sulfate from 263 mg/L to 176 mg/L TDS: NO CHANGE Selenium: NO CHANGE

Segment 6: Bayou de Loutre – from the mouth of Mill Creek downstream to the mouth of Buckaloo Branch
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride : NO CHANGE Sulfate from 237 mg/L to 158 mg/L TDS: NO CHANGE Selenium: NO CHANGE
Segment 7: Bayou de Loutre – from the mouth of Buckaloo Branch downstream to the mouth of Bear Creek
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride : NO CHANGE Sulfate from 216 mg/L to 144 mg/L TDS: NO CHANGE Selenium: NO CHANGE
Segment 8: Bayou de Loutre – unnamed tributaries of Bayou de Loutre from the mouth of Bear Creek to the final segment of Bayou de Loutre
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride : NO CHANGE Sulfate from 198 mg/L to 133 mg/L TDS: NO CHANGE Selenium: NO CHANGE

Segment 9: Bayou de Loutre (Final Segment) - from the mouth of Bear Creek to the Arkansas / Louisiana State Line
No use change
Instream Criteria:
Amend stream segment dissolved minerals criteria: Chloride: NO CHANGE Sulfate from 171 mg/L to 115mg/L TDS: NO CHANGE Selenium: NO CHANGE

5.0 DOCUMENTATION AND TECHNICAL BASIS IN SUPPORT OF THESE REVISED CRITERIA

Enclosed is a timeline of the information submitted and regulatory actions taken to support the revisions to the dissolved minerals criteria for Bayou de Loutre (Attachment A). The submittals and actions demonstrate Lion Oil's significant efforts to support the development of appropriate water quality criteria for this waterbody. Below is a summary of the more significant actions and associated documents that concern the dissolved minerals rulemaking:

1. October 27, 2006. Lion Oil initiates third party rulemaking for dissolved minerals for Loutre Creek and Bayou de Loutre with submittal of the Loutre Creek- Section 2.306 Site Specific Water Quality Study, dated October 3, 2006 (GBMc, 2006 Study) (Attachment B). This documentation provides technical and aquatic life information to document that the historical concentrations of dissolved minerals in Lion Oil's discharge have maintained aquatic life communities (both invertebrate and fish communities) in Loutre Creek and downstream in Bayou de Loutre. The 2006 Study also includes mass balance modeling to determine appropriate dissolved minerals criteria for the reaches in Bayou de Loutre that are downstream of Lion Oil's discharge. The bulk of the documentation supporting the proposed dissolved minerals criteria is included in the 2006 Study. This Bayou de Loutre SSC encloses and relies on the 2006 Study to support the findings and recommendations herein.

2. June, 22 2007. Commission approves third party rulemaking. The original third party rulemaking to support revised dissolved minerals criteria for Loutre Creek and Bayou de Loutre was initiated during the October 27, 2006 Commission meeting and was approved by Minute Order No. 07-10, docket number 06-011-R, signed on June 22, 2007 (Attachment C).

3. August 2007. The Commission-approved criteria sent to Region 6 EPA for review and approval.

4. January 2008. In a letter dated January 3, 2008, EPA approved the third party rulemaking in part by approving the removal of the domestic water supply use for Loutre Creek and Bayou de Loutre. EPA requested additional information related to the modification of the criteria for dissolved minerals. Attachment D provides the EPA request for additional information.

5. June 27, 2008. Lion Oil provides ADEQ with a response to EPA's additional information request (Attachment E). ADEQ forwarded the response to EPA on July 29, 2008. In the cover letter transmitting the response, ADEQ stated that Lion Oil had adequately addressed the EPA issues and that ADEQ was in agreement with the additional information.

6. April 2009. EPA provided notice that the additional information provided in Lion Oil's initial response (Attachment F) to the EPA's January 2008 letter was not adequate for their approval of the revised dissolved minerals criteria. EPAs Record of Decision disapproves the site specific criteria for Loutre Creek and Bayou de Loutre approved by the Commission in 2007.

7. June 15, 2009. To address EPA's concerns related to dissolved minerals, Lion Oil developed an Aquatic Life Justification Supplemental Information Study Plan. The Study Plan was approved by ADEQ and submitted to EPA for review and comment (Attachment G).

8. January 7, 2011. Lion Oil completes the Aquatic Life Justification Supplemental Report and submits to ADEQ and EPA for review (Attachment H). The Report demonstrates that the 2007-Commission approved modifications to the dissolved minerals criteria for Loutre Creek and Bayou de Loutre would be protective of the attainable fisheries use for these waterbodies. This information was developed in accordance with the approved Study Plan and provides additional justification for the revised dissolved minerals criteria for Loutre Creek and Bayou de Loutre. The Supplemental Report includes:

    - A literature review of past rulemakings approved by EPA for other stream segments that demonstrate that the modifications approved in Lion Oil's third party rulemaking approximate and/or are more conservative as compared to other waterbodies.
    - Modeling of projected dissolved minerals concentrations to determine the potential for toxic in-stream effects of the approved dissolved minerals criteria using a GRI model. The model predicted no toxic effects associated with the dissolved minerals concentration levels of the approved criteria.
    - Based on concurrent long term monitoring of in-stream dissolved minerals concentrations and whole effluent toxicity (WET) testing in segments below Lion Oil's discharge, the historical in-stream concentrations of dissolved minerals are supportive of the attainable fisheries use for Loutre Creek and Bayou de Loutre.

- Assessment of the potential for toxic effects of the 2007 approved dissolved minerals criteria using a laboratory developed water matrix to mimic the worst case conditions in the receiving stream indicated the potential for chronic effects in a lab setting, but no such effects have been observed in the field.
- Assessment of long term effluent dissolved minerals concentrations and WET test performance verified that the dissolved minerals discharged in the Lion Oil Outfall 001 effluent had no statistically significant relationship with the results of the WET tests.
- Two technical documents have been prepared in response to comments from the EPA on the Supplemental Report (Attachment I).

9. October 24, 2012. Lion Oil submitted to ADEQ and EPA the results of whole effluent toxicity (WET) tests that were completed to reflect the revised and more stringent dissolved minerals criteria now proposed for adoption. These recent tests show that the criteria proposed for Loutre Creek passed the 7-day chronic WET tests, both lethal and sub-lethal endpoints, evidencing the fact that the proposed criteria for Loutre Creek do not result in either lethal or sub-lethal effects. The criteria proposed for Bayou de Loutre are more stringent (lower in concentration) than those proposed for Loutre Creek so the Bayou de Loutre criteria also do not have such effects. (Attachment J Artificial Matrix WET with 4 tests).

6.0 REFERENCES

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