


# ADEQ

ARKANSAS  
Department of Environmental Quality

|                      |                   |
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| AFIN: _____          | Permit No.: _____ |
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GP Crossett

→ phosphorus

→ PPS

→ Mossy Lake Monitoring Coordinates

→ ELGs

→ WET testing

→ dioxins

Phosphorus

pipeline model study

$$Q = 52.4$$

add LA WQS - no numerical standards

Limits contained in Reg. 6.402  
basis that those limits were based on nutrient  
study for Ouachita River from H.K. Thatcher  
to state line

|          |                |           |
|----------|----------------|-----------|
| AML      |                | DML       |
| 0.7 mg/l | July - October | 1.05 mg/l |
| 1.0 mg/l | NOV. - June    | 1.5 mg/l  |

| #/d        | AML   | DML   |
|------------|-------|-------|
| July - Oct | 305.9 | 458.8 |
| NOV - June | 437.0 | 655.5 |

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→ dioxins

LA regs have daily max. of 20 pg/l  
almost all dioxins generated by bleach plant operations  
these operations have a technology based limit of  
10 pg/l and is measured at the 3 internal outfalls  
∴ won't put LA WQ limit in permit

→ phosphorus

|              | mass, #/q<br>AML | #/q<br>DML | concentration, mg/l<br>AML | mg/l<br>DML |
|--------------|------------------|------------|----------------------------|-------------|
| July - Oct.  | 305.9            | 458.8      | 0.7                        | 1.05        |
| Nov. - June. | 437.0            | 655.5      | 1.0                        | 1.5         |

based on Reg. 6.402

those limits based on nutrient study for the Ouachita River  
from M.K. Thatcher LTD to AR/LA state line  
no numerical phosphorus criteria in LA WQS regs  
some limited narrative criteria

→ PPS

what background flow to use

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## Changes

- outfall & facility coordinates
- flow rate
- Chloroform removed
- facility name
- phosphorous limit added
- 1 yr S.O.C. w/ phosphorous
- LA's nutrients narrative?
- Parts II, III, & IV
- increase WET frequency to 1/2 months from 1/3 months

ask about paper mill production numbers

mossy lake & Coffee Creek not fishable/swimmable

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paper mill

430, Subpart B

|         |            |   |      |           |
|---------|------------|---|------|-----------|
| 453 tpd | fine paper | = | 1306 | 1,000 #/d |
| 596 tpd | paperboard | = | 1192 | 1,000 #/d |
| 751 tpd | tissue     | = | 1502 | 1,000 #/d |

paperboard + tissue

|      |       |            |      |
|------|-------|------------|------|
|      | BPT   | # / 1000 # |      |
|      | DML   |            | AML  |
| BOD5 | 13.65 |            | 7.1  |
| TSS  | 24.0  |            | 12.9 |

pH 5.0 - 9.0 S.U.

fine paper

|      |       |            |      |
|------|-------|------------|------|
|      | BPT,  | # / 1000 # |      |
|      | DML   |            | AML  |
| BOD5 | 10.6  |            | 5.5  |
| TSS  | 22.15 |            | 11.9 |

paperboard + tissue

(1192 + 1502) 1,000 #/d = 2694 1,000 #/d

|      |     |                             |
|------|-----|-----------------------------|
| BOD5 | AML | (2694)(7.1) = 19127.4 #/d   |
|      | DML | (2694)(13.65) = 36773.1 #/d |
| TSS  | AML | (2694)(12.9) = 34752.6 #/d  |
|      | DML | (2694)(24.0) = 64656.0 #/d  |

fine paper

|      |     |                             |
|------|-----|-----------------------------|
| BOD5 | AML | (1306)(5.5) = 7183 #/d      |
|      | DML | (1306)(10.6) = 13843.6 #/d  |
| TSS  | AML | (1306)(11.9) = 15541.4 #/d  |
|      | DML | (1306)(22.15) = 28927.9 #/d |

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TOTAL BOD5 + TSS

BOD5

$$\text{AML} \quad 19127.4 + 7183 = 26310.4 \#/\text{d}$$

$$\text{DML} \quad 36773.1 + 13843.6 = 50616.7 \#/\text{d}$$

TSS


$$\text{AML} \quad 34752.6 + 15541.4 = 50294.0 \#/\text{d}$$

$$\text{DML} \quad 64656.0 + 28927.9 = 93583.9 \#/\text{d}$$

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The acute WQS for TRCadmium + acute + chronic WQS for TRCu are different in LA + AR. The LA WQS are as follows

hardness = 38.4

Cadmium

acute  $e^{(1.1280(\ln \text{hardness}) - 3.828)} \times 1.136672 \cdot (\ln \text{hardness})(0.041838)$

$e^{(1.1280(\ln 38.4) - 3.828)} \times 1.136672 \cdot (\ln 38.4)(0.041838)$

$1.332435958 \times 0.984044572 = 1.31176372 \text{ ug/l dissolved}$

TOTAL Recoverable

$$\frac{C_D}{C_T} = \frac{1}{1 + (K_p)(TSS)(10^{-6})}$$

$$K_p = K_{p0} \times TSS^\alpha$$

$$K_{p0} = 4 \times 10^6$$

$$\alpha = -1.13$$

$$K_p = (4 \times 10^6)(6^{-1.13}) = 528140.021$$

$$\frac{C_D}{C_T} = \frac{1}{1 + (528140.021)(6)(0.000001)} = 0.24$$

$$\text{TOTAL Recoverable} = \frac{C_r}{C_D/C_T} = \frac{1.31}{0.24} = 5.45$$

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Copper

Acute

$$e^{(0.9422 [\ln \text{hardness}] - 1.3844)} \times 0.960$$
$$e^{(0.9422 [\ln 38.4] - 1.3844)} \times 0.960 = 7.478 \text{ } \mu\text{g/l}$$

dissolved

chronic

$$e^{(0.8545 (\ln \text{hardness}) - 1.3860)} \times 0.960$$
$$e^{(0.8545 (\ln 38.4) - 1.3860)} \times 0.960 = 5.422 \text{ } \mu\text{g/l}$$

dissolved

$$K_{po} = 1.04 \times 10^6 \quad \alpha = -0.74$$

$$K_p = K_{po} \times \text{TSS}^\alpha \quad K_p = (1.04 \times 10^6) (6^{-0.74}) = 276185.84$$

$$\frac{C_D}{C_T} = \frac{1}{1 + (K_p)(\text{TSS})(10^{-6})} = \frac{1}{1 + (276185.84)(6)(0.000001)} = 0.376$$

Acute

$$\text{TOTAL RECOVERABLE} = \frac{C_r}{C_D/C_T} = \frac{7.478}{0.376} = 19.89 \text{ } \mu\text{g/l}$$

$$\text{Chronic TR} = \frac{5.422}{0.376} = 14.42 \text{ } \mu\text{g/l}$$

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AFIN: 02-00013

Permit No.: AR0001210

Date: 6/17/2009

By: \_\_\_\_\_

Project: GP CROSCOTT

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5,000 #/d solution

up to 27% N by wt

up to 15%  $P_2O_5$  by wt

MW O = 16  
P = 31

$$2(31) + 5(16) = 142 = \text{MW of } P_2O_5$$

$$\frac{(2)(31)}{142} = 0.437 \text{ fraction of P in MW of } P_2O_5$$

if 1 # soln. then 0.15 #  $P_2O_5$ ,

$$\frac{0.15 \# P_2O_5}{\# \text{ soln}} \cdot \frac{0.437 \# P}{\# P_2O_5} = \frac{0.06555 \# P}{\# \text{ soln}}$$

$$5000 \frac{\# \text{ soln}}{\text{day}} \cdot \frac{0.06555 \# P}{\# \text{ soln}} = 327.75$$

Nitrogen

$$(0.27)(5000) = 1350 \# N/d$$

in application

|      | TOTAL PHOSPHOROUS  | N + N as N         |
|------|--------------------|--------------------|
| 001  | 1.98 mg/l, 753 #/d | 0.18 mg/l 68.5 #/d |
| SMS2 | 1.71 mg/l, 645 #/d | ND                 |



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0013 Ouachita River @ Sterlington, LA  
Subsegment  
LA 090101-00, MUC03180004

*(Robbie)*

Todd Franklin (225) 219 3102