ADEQ
ARKANSAS
Department of Environmental Quality

October 3, 2003

Ms. Dorinda Suitor
Utility Manager
Arkadelphia Water Utilities
P.O. Box 495
Arkadelphia, Arkansas 71923

Re: City of Arkadelphia (NPDES #AR0020605) Evaluation of Maximum Allowable Headworks Loadings (MAHL) and Pretreatment Ordinance

Ms. Suitor:

After reviewing the latest information received please accept the following regarding referenced topic:

Documents, data and software used in this office's review included: 1) the City's eight (8) influent / effluent data; 2) the city's two (2) domestic background analytical results; 3) ADEQ Water Division's Quattro-Pro program for calculation of MAHLs and WQ based "levels not to exceed" (avg. monthly permit limits if necessary) and: 4) EPA's "Guidance Manual on the Development of Local Discharge Limitations Under the Pretreatment Program" (12/87).

Our conversations on 10/2/03 indicated biosolids' disposition at this time is "not generated" at the POTW. Therefore, protection of land application criteria under 40 CFR 503 is not being considered at this time. The remaining criteria for calculating MAHLs are protection against pass through (exceedance of water quality [WQ] standards) and protection against POTW inhibition.

Find enclosed sheets with information used to calculate your POTW MAHLs.

Spreadsheet (SS) 1 calculates estimated removal efficiencies using City-submitted data from April of '02. As footnoted, EPA default removal efficiencies were used for all parameters except Cu, Ag and Zn since the majority of the submitted analyticals for inf/eff were non-detect (ND).

SS 2 estimates domestic loading based on an avg. POTW flow of 2.5 MGD subtracting one (1) categorical industrial user's flow of 0.044 MGD. Again, most of the parameters were ND. Those values were entered at 1/2 ND for estimating lbs/day. EPA default #s were not used.

SSs 3 & 4 show information used, and calculation results showing what Arkadelphia's effluent "levels not to exceed" (permit limits - avg. monthly levels) would be using **current** Reg. #2 WQ criteria and permit writers' procedures. These values will remain static unless any regulations or permitting procedures change.

At this time, no permit limits for the parameters in this study are deemed necessary for Arkadelphia. Comparison of any future effluent results (not NPDES permit required) to these "levels not to exceed" will give a quick evaluation whether you're getting close to exceeding any of these values. Effluent data you submitted from 4/02 shows all parameters (Hg unknown because of method detection levels) have a substantial safety factor (See enclosed influent/effluent summary sheet).

SS 5 is the summary and "substance" of the documentation for Arkadelphia's currently estimated Maximum Allowable Headworks Loadings "not to exceed" for protection against interference and pass through. The MAHLs have been converted to maximum concentrations (MAHC) using an avg. POTW flow of 2.5 MGD. Future influent analysis (again, not NPDES required) for these parameters can be used to self-evaluate whether these MAHCs are in danger of being exceeded. Influent values submitted back in 4/02 would indicate substantial safety margins (see enclosed influent/effluent summary sheet).

Also shown on SS 5 are the Maximum Allowable Industrial Loadings (MAIL). These are the results of subtracting a 20% safety (growth) factor and the domestic loadings for each parameter. Your present MAILs indicate generous amounts of the various parameters remaining for future industry growth (except Hg). Please contact this office if there are any questions regarding this summary sheet and its meaning.

Summary Comments and Conclusion:

If it is desired by City officials at this time to adopt the "Model EPA Pretreatment Ordinance" (located at the following website and several "pages" down into it: http://cfpub1.epa.gov/npdes/pkeyword.cfm?keywords=pretreatment&program_id=0R), it is advised to include a narrative description in your "Local Limits" (Section 2.4 of the Model Ordinance on page 11) referencing the attached MAHLs where the basis can be found to "establish local limits as necessary by the [appropriate city official]" or words to that effect.

Some cities in Arkansas have demonstrated technically based local limits (TBLL) aren't necessary and found it adequate to include only a narrative in their ordinances. MAHLs are dynamic (even from day to day but shouldn't be substantially different from those enclosed) and may be revised from time to time depending on domestic and industry make-up. A narrative regarding "local limits" circumvents the revision and adoption process for a new ordinance each time MAHLs are re-evaluated/revised. Four (4) examples are enclosed. In Arkadelphia's present case, it's suggested to use similar language.

Also enclosed is an influent/effluent summary sheet that Pretreatment Cities throughout this State are required to submit with their annual reports. This form is being supplied to you for your own convenience and possible use. This office reiterates that influent/effluent sampling and analysis is NOT required by your NPDES permit.

If there are further questions or concerns, feel free to contact this office at 501.682.0625 or via e-mail at Gilliam@adeq.state.ar.us.

Sincerely,

Allen R. Gilliam

Allen R. Gilliam
ADEQ State Pretreatment Coordinator

Encl: Quattro Pro Spreadsheets; example ordinance narratives regarding local limits; inf/eff summary sheet

cc: Lee Bohme/EPA 6WQ-PO

Spreadsheet 1

						Arkadelphia Removal %s with limited data						(see footnote at bottom)					
Influent																	
Date	Cadmium		Copper		Lead		Mercury		Nickel		Selenium		Silver		Zinc	Chromium	Cyanide	Arsenic
04/29/02	0.00013		0.01200		0.00210		0.00020		0.01000		0.00200		0.01400		0.05200	0.00700	0.01000	0.00100
04/24/02	0.00010		0.00990		0.00100		0.00020		0.01000		0.00200		0.01100		0.03700	0.00700	0.01000	0.00100
04/22/02	0.00010		0.01500		0.00160		0.00020		0.01000		0.00200		0.01000		0.05800	0.00700	0.01000	0.00100
04/17/02	0.00014		0.01300		0.00370		0.00020		0.01000		0.00200		0.00310		0.07600	0.00700	0.01000	0.00100
04/15/02	0.00010		0.00630		0.00190		0.00020		0.01700		0.00200		0.00020		0.03300	0.00700	0.01000	0.00100
05/08/02	0.00011		0.02400		0.00140		0.00020		0.01000		0.00200		0.00085		0.08600	0.00700	0.01000	0.00100
05/06/02	0.00011		0.01200		0.00130		0.00020		0.01000		0.00200		0.00180		0.09600	0.00700	0.01000	0.00100
05/01/02	0.00017		0.02500		0.00280		0.00020		0.01000		0.00200		0.00370		0.12000	0.00700	0.01000	0.00100
Detection Level	0.0010		0.0100		0.0050		0.0002		0.0400		0.0050		0.0020		0.0200	0.0100	0.0200	0.0100
Average	0.0001		0.0147		0.0020		0.0002		0.0109		0.0020		0.0056		0.0698	0.0070	0.0100	0.0010
Maximum	0.0002		0.0250		0.0037		0.0002		0.0170		0.0020		0.0140		0.1200	0.0070	0.0100	0.0010
>Detection Level	No		Yes		No		No		No		No		Yes		Yes	No	No	No
Effluent																		
Date	Cadmium		Copper		Lead		Mercury		Nickel		Selenium		Silver		Zinc	Chromium	Cyanide	Arsenic
04/29/02	0.00010		0.00600		0.00100		0.00020		0.01000		0.00200		0.00074		0.01200	0.00700	0.01000	0.00100
04/24/02	0.00010		0.00600		0.00100		0.00020		0.01000		0.00200		0.00071		0.01100	0.00700	0.01000	0.00100
04/22/02	0.00010		0.00600		0.00100		0.00020		0.01000		0.00200		0.00065		0.00200	0.00700	0.01000	0.00100
04/17/02	0.00010		0.00600		0.00100		0.00020		0.01000		0.00200		0.00081		0.01900	0.00700	0.01000	0.00100
04/15/02	0.00010		0.00600		0.00100		0.00020		0.01000		0.00200		0.00075		0.01800	0.00700	0.01000	0.05000
05/08/02	0.00010		0.00600		0.00100		0.00020		0.01000		0.00200		0.00070		0.01500	0.00700	0.01000	0.00100
05/06/02	0.00010		0.00100		0.00100		0.00020		0.01000		0.00200		0.00066		0.01200	0.00700	0.01000	0.00100
05/01/02	0.00010		0.00810		0.00100		0.00020		0.01000		0.00200		0.00080		0.01600	0.00700	0.01000	0.00100
Detection Level	0.001		0.01		0.005		0.0002		0.040		0.005		0.002		0.02	0.01	0.02	0.01
Average	0.0001		0.0056		0.0010		0.0002		0.0100		0.0020		0.0007		0.0160	0.0070	0.0100	0.0071
Maximum	0.0001		0.0081		0.0010		0.0002		0.0100		0.0020		0.0008		0.0190	0.0070	0.0100	0.0500
>Detection Level	No		No		No		No		No		No		No		Yes	No	No	Yes
% Rem																		
	Cadmium		Copper		Lead		Mercury		Nickel		Selenium		Silver		Zinc	Chromium	Cyanide	Arsenic
Average	17		62		49		0		8		0		87		77	0	0	-613
EPA % REM	67		86		61		60		42		50		75		79	82	69	45
*Use EPA default	*				*		*		*		*					*	*	*

		Arkadelphia									
Pollutants	EPA, P3-59	Avg Reported	Loading		Domestic Loadings based on 2.46 MGD						
	mg/l	mg/l	Lbs/day								
Cadmium Total	0.0030	0.0002	0.00								
Copper Total	0.0601	0.0490	1.00								
Lead Total	0.0490	0.0035	0.07								
Mercury Total	0.0003	0.0000	0.01								
Nickel Total	0.0210	0.0050	0.10								
Selenium Total	-	0.0010	0.02								
Silver Total	0.0050	0.0002	0.00								
Zinc Total	0.1750	0.1435	2.94								
Chromium Total	0.0500	0.0035	0.07								
Cyanide Total	0.0410	0.0050	0.10								
Arsenic	0.0030	0.0028	0.06								
Molybdenum	-	?	0.00								
Date	Cadmium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc	Chromium	Cyanide	Arsenic
08/23/02	0.00019	0.06400	0.00480	0.00000	0.00500	0.00100	0.00029	0.19000	0.00350	0.00500	0.00050
08/21/02	0.00013	0.03400	0.00220	0.00000	0.00500	0.00100	0.00010	0.09700	0.00350	0.00500	0.00500
Detection Level	0.0010	0.0100	0.0050	0.0002	0.0400	0.0050	0.0020	0.0200	0.0100	0.0200	0.0100
Average	0.0002	0.0490	0.0035	0.0000	0.0050	0.0010	0.0002	0.1435	0.0035	0.0050	0.0028
Maximum	0.0002	0.0640	0.0048	0.0000	0.0050	0.0010	0.0003	0.1900	0.0035	0.0050	0.0050
Yes/No	No	Yes	No	No	No	No	No	Yes	No	No	No

			WQ info for estimating MAHLs										
Permittee		City of Arkadelphia											
Receiving Stream		Ouchita River											
Permit number		AR0020605											
Design Flow (Qd)		3.00	MGD	Average Flow (Qa)		2.5	MGD						
Design Flow (Qd)		4.64	CFS	Industries Flow (Qi)		0.044	MGD (from Torrence)						
7Q10 =		379.00	CFS	Domestic Flow(Qdo)		2.46	MGD						
Long Term Average =		4425.00	CFS	TSS for:									
Using Diffusers		no	Yes/No	Gulf Coastal 5.5 mg/l		Ouach Mount = 2 mg/l							
pH =		6.94	S.U.	Ark River Valley = 3 mg/l		Ozark Highands = 2.5 mg/l							
Total Hardness		28.00	mg/l	Boston Mount = 1.3 mg/l		Delta = 8 mg/l							
TSS		5.5	mg/l										
Chronic Aquatic Toxicity:		0.25		Total Hardness for:									
Acute Aquatic Toxicity:		0.13		Arkansas River = 125 mg/l			Red River = 211 mg/l						
				Ouachita River = 28 mg/l			St. Francis River = 103 mg/l						
For the following receiving		enter 0.06 in cell "C17		White River = 116 mg/l									
Mississippi, Arkansas, Red River.				Gulf Coastal = 31 mg/l			Ouachita Mount = 31 mg/l						
White (Below confluence with Black River)				Ozark Highlands = 148 mg/l			Ark River Valley = 25 mg/l						
Ouachita (below Confluence with Little Miss. River				Boston Mount = 25 mg/l			Delta = 81 mg/l						
Upstream Flow (Qb) =		94.75	(Chronic)	49.27	(Acute)								
Pollutant Concentration Upstream (Cb) = 0 ug/l													
Water Effect Ratio(WER)		1.00											
Cancer Risk Level:		1.00E-05	(STATE); 1.00e-6 (EPA)										
IWC = Instream concentration of pollutant after mixing with the receiving stream													
IWC = (Cd*Qd + Cb*Qb)/(Qb +Qd)													
Cd = Pollutant concentration in the effluent (ug/l) =				Reported value as Total									

SS 4

Permittee	City of Arkadelphia		Water Quality "levels not to exceed" (AML)					
Receiving Stream	Ouchita River							
Permit number	AR0020605							
Design Flow (Qd)	3.00	MGD	Average Flow (Qa)		2.5	MGD (from last ~8 months' DMRs)		
Design Flow (Qd)	4.64	CFS						
7Q10 =	379.00	CFS						
Long Term Average =	4425.00	CFS						
Using Diffusers	no	Yes/No						
pH =	6.94	S.U.						
Total Hardness	28.00	mg/l						
TSS	5.50	mg/l						
Chronic Aquatic Toxic	0.25		Qb	94.75				
Acute Aquatic Toxicity	0.13		Qb	49.27				
Cb	0.00	ug/l						
AML factor	1.55							
	WQSa	WLAa	LTAa	WQSc	WLAc	LTAc	LTAa/LTAc	AML, mg/l
Cadmium Total	3.91	45.50	25.94	1.6891	36.22	26.08	25.94	0.0402
Copper Total	13.44	156.27	89.07	10.0216	214.89	154.72	89.07	0.1381
Lead Total	77.87	905.57	516.18	3.0343	65.06	46.84	46.84	0.0726
Mercury Total	6.70	77.92	44.41	0.0120	0.26	0.19	0.19	0.0003
Nickel Total	973.88	11326.17	6455.92	108.1568	2319.13	1669.77	1669.77	2.5881
Selenium Total	20.00	232.60	132.58	5.0000	107.21	77.19	77.19	0.1196
Silver Total	1.27	14.74	8.40	1E+08	**********	**********	8.40	0.0130
Zinc Total	120.05	1396.23	795.85	109.6281	2350.68	1692.49	795.85	1.2336
Chromium Total	925.86	10767.80	6137.65	300.3410	6440.00	4636.80	4636.80	7.1870
Cyanide Total	22.36	260.05	148.23	5.2000	111.50	80.28	80.28	0.1244

				City of Arkadelphia's estimated MAHLs, etc.										
Pollutant	% Rem	**Water Quality**	Water Quality*	Sludge	Sludge+	Inhibition**	Inhibition++	MAHL	**MAHC^**	Domestic	Allocation for %SF	MAIL	Max Influent	Max Effluent
		mg/l	lbs/day	mg/kg	lbs/day	mg/l	lbs/day	lbs/day	**mg/l**	lbs/day	lbs/day^	lbs/day	vs MAHC	vs WQS(mg/l)
Cadmium Total	67	**0.0402**	2.5401	85	0	1.00	20.85	2.54	**0.12**	0.00	2.03	2.03	No	No
Copper Total	62	**0.1381**	7.4805	4300	0	1.00	20.85	7.48	**0.36**	1.00	5.98	4.98	No	No
Lead Total	61	**0.0726**	3.8818	840	0	1.00	20.85	3.88	**0.19**	0.07	3.11	3.03	No	No
Mercury Total	60	**0.00029**	0.0150	57	0	0.10	2.09	0.01	**0.00072**	0.01	0.01	0.01	No	No
Nickel Total	42	**2.5881**	93.0395	420	0	1.00	20.85	20.85	**1.00**	0.10	16.68	16.58	No	No
Selenium Total	50	**0.1196**	4.9893	100	0	0.20	4.17	4.17	**0.20**	0.02	3.34	3.32	No	No
Silver Total	87	**0.0130**	2.0883			0.25	5.21	2.09	**0.10**	0.00	1.67	1.67	No	No
Zinc Total	77	**1.2336**	112.1231	7500	0	0.30	6.25	6.25	**0.30**	2.94	5.00	2.06	No	No
Chromium Total	82	**7.1870**	832.4986	3000	0	1.00	20.85	20.85	**1.00**	0.07	16.68	16.61	No	No
Cyanide Total	69	**0.1244**	8.3692			0.10	2.09	2.09	**0.10**	0.10	1.67	1.57	No	No
Arsenic	45			75	0	0.10	2.09	2.09	**0.10**	0.06	1.67	1.61	No	No
Molybdenum	50			75	0	0.20	4.17	4.17	**0.20**	0.00	3.34	3.34		
Dry tons/day of sludge		0.00	Safety Factor	0.20										
* lbs/day = mg/l * 8.34 * average flow / (1-%Rem)					Average flow =		2.50	MGD						
** Page 3-44 of EPA														
+ lbs/day = (dry tons/day * 0.002 * criteria(mg/kg))/ % Rem														
++ lbs/day = mg/l * average Flow * 8.34														
^ lbs/day = (1 - SF) * MAHL														
MAIL = Maximum allowable industrial loading = Allocation for % SF - Domestic														
MAHL = Maximum allowable headworks level (most stringent of WQ, Sludge, and inhibition in unit of lbs/day)														
^ MAHC = MAHL converted to mg/l using avg. flow														
********** = Not Available														