ATTACHMENT 1 TO APPENDIX 16

USACE SEDIMENT QUALITY ASSURANCE SUMMARIES

TABLE 16-1
SEDIMENT PESTICIDES QA/QC SUMMARY

	Blank	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**
	mg/kg	**% R**	**mg/kg**	**% R**	**mg/kg**	**% R**	**mg/kg**	**% R**
	Big Sunflower January 1993		Big Sunflower January 1993		Big Sunflower February 1993		Big Sunflower June 1993	
	28616		28707		29097		33080	
Aldrin (45-140)[a/]	<0.0027	78	<0.0027	55	<0.0027	68	<0.0013	85
A-BHC	<0.0020		<0.0020		<0.0020		<0.00099	
B-BHC	<0.0040		0.0027J		<0.0040		<0.0020	
G-BHC (60-125) [a/]	<0.0027	82	<0.0027	54	<0.0027	67	<0.0013	56
D-BHC	<0.0060		<0.0060		<0.0060		<0.00030	
ppDDD	<0.0074		0.0013J		<0.0074		<0.0036	
ppDDE	<0.0027		0.00028J		<0.0027		<0.0013	
ppDDT (45-140) [a/]	<0.0080	84	0.0021J	96	0.0028J	88	<0.0040	100
Heptachlor (50-140) [a/]	0.0011 J	86	0.0017J	59	0.0016J	70	0.0011	78
Dieldrin (65-125) [a/]	<0.0013	84	0.0018	80	0.00044J	80	<0.00066	84
A-Endosulfan	<0.0094		<0.0094		<0.0094		<0.0046	
B-Endosulfan	<0.0027		<0.0027		0.0017J		<0.0013	
Endosulfan Sulfate	<0.044		<0.044		<0.044		<0.022	
Endrin (60-135) [a/]	<0.0040		0.0011 J		<0.0040	76	<0.0020	84
Endrin Aldehyde	<0.015		0.0031J		<0.015		<0.0076	
Heptachlor Epoxide	<0.056		<0.056		<0.056		<0.027	
Methoxychlor	<0.12		<0.12		<0.12		<0.058	
Chlordane	<0.0094		<0.0094		<0.0094		<0.0046	
Toxaphene	<0.16		<0.16		<0.16		<0.079	
SURROGATES								
2,4,5,6-Tetrachloro-m-xylene Range (60 – 150 %)	93%		79%		72%		59%	
mean		79		67		69		55
Min		59		57		63		37
max		94		79		73		79
Decachlorobiphenyl Range (60 – 150 %)	99 %		76%		87%		88%	
Mean		86		84		81		82
Min		61		75		79		64
max		99		95		87		94

J = estimated value < MDL
LCS = laboratory control sample
a/ DoD LCS % recovery range (DoD, 2006)

TABLE 16-2
SEDIMENT PESTICIDES QA/QC SUMMARY

	Blank	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**
	mg/kg	% R	mg/kg	% R	mg/kg	% R	mg/kg	% R
	Steele Bayou August 1995		Steele Bayou September 1996		Big Sunflower December 1998		Big Sunflower January 1999	
	56993		67447		82537		82605	
Aldrin (45-140)[a/]	<0.0013	85	<0.0050	80	<0.0017	70	<0.00083	150
A-BHC	<0.00099		<0.0050		<0.0017		<0.00083	
B-BHC	<0.0020		<0.0050		<0.0017		<0.00083	
G-BHC (60-125) [a/]	<0.0013	90	<0.0050	70	<0.0017	80	<0.00083	140
D-BHC	<0.00030		<0.0050		<0.0017		<0.00083	
ppDDD	<0.0036		<0.0100		<0.0033		<0.0017	
ppDDE	<0.0013		<0.010		<0.0033		<0.0017	
ppDDT (45-140) [a/]	<0.0040	80	<0.010	95	<0.0033	80	<0.0017	135
Heptachlor (50-140) [a/]	<0.00099	85	<0.0070	80	<0.0017	90	<0.00083	145
Dieldrin (65-125) [a/]	<0.00066	88	<0.0050	90	<0.0033	85	<0.0017	150
A-Endosulfan	<0.0046		<0.0050		<0.0017		<0.00083	
B-Endosulfan	<0.0013		<0.0050		<0.0033		<0.0017	
Endosulfan Sulfate	<0.022		<0.0100		<0.0033		<0.0017	
Endrin (60-135) [a/]	<0.0020	84	<0.0150	100	<0.0033	90	<0.0017	145
Endrin Aldehyde	<0.0076		<0.0100		<0.0033		<0.0017	
Heptachlor Epoxide	<0.027		<0.0050		0.0017		<0.00083	
Methoxychlor	<0.058		<0.050		<0.017		<0.0083	
Chlordane	<0.0046		<0.0050		<0.0017		<0.0083	
Toxaphene	<0.079		<0.050		<0.0083		<0.00083	
SURROGATES								
2,4,5,6-Tetrachloro-m-xylene Range (60 – 150 %)	89%		75%		96.5%		67.5%	
mean		86		81		92		62
Min		77		68		85		49
max		89		88		99		71
Decachlorobiphenyl Range (60 – 150 %)	90%		70%		87.5%		64.6%	
Mean		85		69		91		68
Min		82		60		81		59
max		90		75		118		80

J = estimated value < MDL
LCS = laboratory control sample
a/ DoD LCS % recovery range (DoD, 2006)

TABLE 16-3
SEDIMENT PESTICIDES QA/QC SUMMARY

	Blank	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**
	mg/kg	**% R**	**mg/kg**	**% R**	**mg/kg**	**% R**	**mg/kg**	**% R**
	Big Sunflower January 1999		Big Sunflower January 1999		Big Sunflower January 1999		Big Sunflower February 1999	
	82765		82861		82890		82940	
Aldrin (45-140)[a/]	<0.00083	101	<0.00083	92	<0.00083	93	<0.00083	85
A-BHC	<0.00083		<0.00083		<0.00083		<0.00083	
B-BHC	<0.00083		<0.00083		<0.00083		<0.00083	
G-BHC (60-125) [a/]	<0.00083	95	<0.00083	85	<0.00083	89	<0.00083	87
D-BHC	<0.00083		<0.00083		<0.00083		<0.00083	
ppDDD	<0.0017		<0.0017		<0.0017		<0.0017	
ppDDE	<0.0017		<0.0017		<0.0017		<0.017	
ppDDT (45-140) [a/]	<0.0017	102	<0.0017	87	<0.0017	84	<0.0017	101
Heptachlor (50-140) [a/]	<0.00083	110	<0.00083	98	<0.00083	101	<0.00083	82
Dieldrin (65-125) [a/]	<0.0017	103	<0.0017	93	<0.0017	94	<0.0017	92
A-Endosulfan	<0.00083		<0.00083		<0.00083		<0.00083	
B-Endosulfan	<0.0017		<0.0017		<0.0017		<0.0017	
Endosulfan Sulfate	<0.0017		<0.0017		<0.0017		<0.00083	
Endrin (60-135) [a/]	<0.0017	83	<0.0017	76	<0.0017	81	<0.0017	83
Endrin Aldehyde	<0.0017		<0.0017		<0.0017		<0.0017	
Heptachlor Epoxide	<0.00083		<0.00083		<0.00083		<0.00083	
Methoxychlor	<0.0083		<0.0083		<0.0083		<0.0083	
Chlordane	<0.0083		<0.0083		<0.0083		<0.0083	
Toxaphene	<0.0083		<0.0083		<0.0083		<0.0083	
SURROGATES								
2,4,5,6-Tetrachloro-m-xylene Range (60 – 150 %)	72.4%		90.8%		67.1%		97.5%	
mean		88		83		76		99
Min		72		55		48		87
max		101		113		99		115
Decachlorobiphenyl Range (60 – 150 %)	76.4%		85.2%		65.2%		94.6%	
Mean		93		83		73		103
Min		76		51		50		94
max		103		113		95		135

J = estimated value < MDL
LCS = laboratory control sample
a/ DoD LCS % recovery range (DoD, 2006)

TABLE 16-4
SEDIMENT PESTICIDES QA/QC SUMMARY

	Blank	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**
	µg/kg	**% R**	**µg/kg**	**% R**	**µg/kg**	**% R**	**µg/kg**	**% R**
	Big Sunflower March 1999		Big Sunflower April 1999		Steele Bayou July 1999		Steele Bayou July 1999	
	83442		83941		84773		84793	
Aldrin (45-140)[a/]	<0.83	81	<0.83	76	<0.83	72	<0.83	77
A-BHC	<0.83		<0.83		<0.83		<0.83	
B-BHC	<0.83		<0.83		<0.83		<0.83	
G-BHC (60-125) [a/]	<0.83	100	<0.83	88	<0.83	78	<0.83	76
D-BHC	<0.83		<0.83		<0.83		<0.83	
ppDDD	<0.83		<1.67		<1.67		<1.67	
ppDDE	<1.7		<1.67		<1.67		<1.67	
ppDDT (45-140) [a/]	<1.7	87	<1.67	86	<1.67	80	<1.67	84
Heptachlor (50-140) [a/]	<0.83	80	<0.83	84	<0.83	81	<0.83	80
Dieldrin (65-125) [a/]	<1.7	83	<1.67	76	<1.67	84	<1.67	85
A-Endosulfan	<0.83		<0.83		<0.83		<0.83	
B-Endosulfan	<1.7		<1.67		<1.67		<1.67	
Endosulfan Sulfate	<1.7		<1.67		<1.67		<1.67	
Endrin (60-135) [a/]	<1.7	82	<1.67	81	<1.67	87	<1.67	87
Endrin Aldehyde	<1.7		<1.67		<1.67		<1.67	
Heptachlor Epoxide	<0.83		<0.83		<0.83		<0.83	
Methoxychlor	<8.3		<8.3		<8.3		<8.3	
Chlordane	<8.3		<8.3		<8.3		<8.3	
Toxaphene	<8.3		<8.3		<8.3		<8.3	
SURROGATES								
2,4,5,6-Tetrachloro-m-xylene Range (60 – 150 %)	80.3%		93.0%		89.9%		61.1%	
mean		80		91		75		65
Min		69		80		65		61
max		88		129		85		68
Decachlorobiphenyl Range (60 – 150 %)	80.0%		101%		106%		91.1%	
Mean		97		103		94		90
Min		74		88		90		86
max		118		155		98		95

J = estimated value < MDL
LCS = laboratory control sample
a/ DoD LCS % recovery range (DoD, 2006)

TABLE 16-5
SEDIMENT PESTICIDES QA/QC SUMMARY

	Blank	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**	**Blank**	**LCS**
	µg/kg	**% R**	**µg/kg**	**% R**	**µg/kg**	**% R**	**µg/kg**	**% R**
	Steele Bayou July 1999		Steele Bayou August 1999		Steele Bayou August 1999		Steele Bayou September 1999	
	84856		84909		85388		86005	
Aldrin (45-140)[a/]	<0.83	65	<0.83	76	<0.83	71	<0.83	69
A-BHC	<0.83		<0.83		<0.83		<0.83	
B-BHC	<0.83		<0.83		<0.83		<0.83	
G-BHC (60-125)[a/]	<0.83	70	<0.83	81	<0.83	70	<0.83	81
D-BHC	<0.83		<0.83		<0.83		<0.83	
ppDDD	<1.67		<1.67		<1.67		<1.67	
ppDDE	<1.67		0.79J		<1.67		<1.67	
ppDDT (45-140)[a/]	<1.67	81	1.57J	97	<1.67	79	<1.67	69
Heptachlor (50-140)[a/]	<0.83	83	<0.83	99	<0.83	87	<0.83	67
Dieldrin (65-125)[a/]	<1.67	76	<1.67	88	<1.67	84	<1.67	67
A-Endosulfan	<0.83		<0.83		<0.83		<0.83	
B-Endosulfan	<1.67		<1.67		<1.67		<1.67	
Endosulfan Sulfate	<1.67		<1.67		<1.67		<1.67	
Endrin (60-135)[a/]	<1.67	71	<1.67	85	<1.67	81	<1.67	72
Endrin Aldehyde	<1.67		<1.67		<1.67		<1.67	
Heptachlor Epoxide	<0.83		<0.83		0.911		<0.83	
Methoxychlor	<8.3		<8.3		<8.3		<8.3	
Chlordane	<8.3		<8.3		<8.3		<8.3	
Toxaphene	<8.3		<8.3		<8.3		<8.3	
SURROGATES								
2,4,5,6-Tetrachloro-m-xylene Range (60 – 150 %)	73.8%		70.2%		88.3%		54.2%	
mean		70		74		88		74
Min		64		68		75		39
max		75		79		106		88
Decachlorobiphenyl Range (60 – 150 %)	94.9%		95.6%		98.4%		58.3%	
Mean		86		93		91		79
Min		82		84		81		51
max		90		115		98		92

J = estimated value < MDL
LCS = laboratory control sample
a/ DoD LCS % recovery range (DoD, 2006)

TABLE 16-6
SEDIMENT METALS QA/QC SUMMARY

	Blank	Spike	Duplicate	Blank	Spike	Duplicate	Blank	Spike	Duplicate
	mg/kg	% R	% RPD	mg/kg	% R	% RPD	mg/kg	% R	% RPD
	Big Sunflower January 1993			Big Sunflower January 1993			Big Sunflower February 1993		
	28592			28699			29087		
Arsenic	<1.00	104	14.6	<0.50	112	31.6	<0.20	110	6.6
Cadmium	0.02	85.0	14.0	0.03	86.0	42.4	<0.02	105	68
Chromium	<0.50	119	0.8	1.00	117	2.8	<0.50	112	7.7
Copper	<1.00	123	3.1	<1.00	b/	7.4	<1.00	108	2.3
Lead	<4.00	108	15	<4.00	94.2	9.5	<4.00	123	13.4
Mercury	<0.10	b/	0	<0.10	b/	0	<0.10	b/	0
Nickel	<1.00	119	4.7	<1.10	b/	3.2	1.2	105	3.4
Selenium	<0.50	94.0	18.2	0.03	100	111	<0.20	90	12.5
Zinc	450	104	0	2.90	b/	1.4	3	b/	1.3
Barium	<2.50	90.0	0.8	<2.50	104	8.0	<2.5	137	3.2
Cobalt	<4.00	104	6.2	<2.00	b/	17.5	<2.5	137	3.2
Iron	<3.00	b/	3.1	5.10	119	32.8	<3.0	b/	6.4
Manganese	<0.60	104	0.8	<0.60	b/	3.2	<0.60	b/	6.8

	Blank	Spike	Duplicate	Blank	Spike	Duplicate	Blank	Spike	Duplicate
	mg/kg	% R	% RPD	mg/kg	% R	% RPD	mg/kg	% R	% RPD
	Backwater Lakes January 1995			Steele Bayou August 1995			Big Sunflower August 1995		
	51544			56988			57032		
Arsenic	<0.20	92.5	7.2	<0.20	97.5	4.6	<0.20	102	0
Cadmium	0.038	108	3.8	<0.02	109	8.2	<0.02	101	2.2
Chromium	<1.00	100	0.4	<1.00	112	2.4	<1.00	107	19
Copper	<0.50	110	2.2	<0.50	113	0	1.80	101	20
Lead	<0.10	106	4.1	<5.0	80.6	9.6	<5.00	93.4	20
Mercury	<0.20	115	25	<0.10	103	14	<0.10	104	0
Nickel	1.4	108	1.0	0.60	97.4	0.8	0.80	104	1.3
Selenium	<0.20	79.0	12	<0.20	96.0	5.7	<0.20	91.0	1.1
Zinc	8.90	82.0	2.0	3.5	108	3.2	<0.90	97.0	5.4

% R – percent recovery (75-125)
Spike – matrix spike
Duplicate – sample duplicate
% RPD – relative percent difference
b/ - data not reported

TABLE 16-7
SEDIMENT METALS QA/QC SUMMARY

	Blank	Spike	Dup	Blank	Spike	Dup	LCS	Blank	Spike	Dup	LCS
	mg/kg	% R	% RPD	mg/kg	% R	% RPD	% R	mg/kg	% R	% RPD	% R
	Big Sunflower August 1995			Steele Bayou September 1996				Big Sunflower December 1998			
	57093			67439				82524			
Arsenic	<0.20	100	6.7	<2.0	92.0	1.0	93.0	<0.20	93.0	3.1	87.0
Cadmium	<0.02	105	2.7	<0.02	98.2	0.5	102	<0.02	92.4	0.2	92.0
Chromium	<1.00	103	2.3	0.2	94.8	0.4	100	<0.20	90.8	3.1	104
Copper	2.2	104	1.4	<0.50	95.8	0.3	81.6	0.10	94.2	7.4	75.6
Lead	<5.0	75.0	18	<1.0	92.8	0.5	94.0	0.20	93.4	3.9	96.8
Mercury	<0.10	117	0	<0.02	112	3.1	95.9	<0.02	103	2.1	100
Nickel	0.80	104	0.6	0.50	93.8	0.8	97.4	0.6	92.2	0.4	103
Selenium	<0.20	88.0	7.4	<0.20	84.5	1.5	105	<0.20	82.2	54	71.0
Zinc	<0.90	101	0.8	1.1	91.8	0.8	94.4	<1.0	95.0	2.4	77.6

	Blank	Spike	Dup	LCS	Blank	Spike	Dup	LCS	Blank	Spike	Dup	LCS
	mg/kg	% R	% RPD	% R	mg/kg	% R	% RPD	% R	mg/kg	% R	% RPD	% R
	Steele Bayou July 1999				Steele Bayou July 1999				Steele Bayou August 1999			
	84759				84844				84939			
Arsenic	<2.0	95.8	3.2	96.0	<2.0	95.8	7.6	90.5	<2.0	94.4	1.0	94.0
Cadmium	<0.02	90.2	4.0	95.5	<0.5	96.0	0	94.0	<0.02	92.2	0	83.6
Chromium	<0.20	98.8	0	99.0	<0.2	104	1.4	96.5	0.40	98.6	2.0	100
Copper	<1.00	107	0.7	112	0.30	91.2	7.9	88.0	0.10	81.8	0.8	89.9
Lead	1.00	93.0	1.0	102	<1.0	99.6	1.3	96.8	<2.0	93.8	3.3	98.4
Mercury	<0.01	85.7	2.4	99.6	<0.01	114	2.7	104	<0.10	103	0.9	99.7
Nickel	<0.70	94.0	0.9	105	<0.80	101	1.7	102	1.0	94.2	3.1	104
Selenium	<0.20	88.0	8.0	72.0	<0.20	83.0	14	91.0	<0.20	80.0	10	76.4
Zinc	<1.00	84.0	11	76.8	2.2	103	4.9	84.0	1.4	82.2	0	84.0

% R – percent recovery (75-125)
Spike – matrix spike
Dup – sample duplicate
% RPD – relative percent difference
LCS – laboratory control sample

TABLE 16-8
SEDIMENT METALS QA/QC SUMMARY

	Blank	**Spike**	**Dup**	**LCS**	**Blank**	**Spike**	**Dup**	**LCS**	**Blank**	**Spike**	**Dup**	**LCS**
	mg/kg	**% R**	**% RPD**	**% R**	**mg/kg**	**% R**	**% RPD**	**% R**	**mg/kg**	**% R**	**% RPD**	**% R**
	Steele Bayou Basin August 1999				Steele Bayou Basin September 1999				Backwater Lakes July 2000			
	85390				86017				90041			
Arsenic	<2.0	89.8	3.8	98.0	<2.0	86.2	10	93.0	<0.20	90.6	4.5	93.2
Cadmium	<0.02	92.4	2.2	110	0.02	87.8	0	118	<0.02	83.6	6.6	86.0
Chromium	<0.2	96.6	0.3	117	<2.0	87.8	8.1	98.0	<0.10	109	0.3	110
Copper	0.30	85.4	5.6	97.6	2.8	111	6.1	89.5	<0.10	94.0	0.6	100
Lead	1.0	88.2	1.0	104	<1.0	88.6	8.7	97.4	<0.10	107	0.4	113
Mercury	<0.01	107	0.2	96.9	<0.01	100	3.1	99.6	<0.010	109	1.0	98.1
Nickel	1.3	91.4	0.7	115	0.8	85.6	8.7	103	<0.10	91.8	0.6	113
Selenium	<0.20	84.0	13	87.5	<0.20	80.2	6.1	81.5	<0.20	82.6	9.7	84.0
Zinc	1.2	86.0	1.8	86.0	3.7	105	6.0	72.4	<1.00	118	0.8	101

	Blank	Spike	Dup	LCS						
	mg/kg	% R	% RPD	% R						
	Deer Creek Basin July 2004									
	121136									
Arsenic	<0.20	93.0	1.5	92.4						
Cadmium	<0.02	99.2	2.8	96.4						
Chromium	<0.10	105	3.8	103						
Copper	<0.10	98.5	1.4	104						
Lead	<0.10	116	8.2	103						
Mercury	<0.10	96.3	0	96.3						
Nickel	<0.10	99.9	0.5	102						
Selenium	<0.20	93.5	8.7	84.6						
Zinc	<1.0	95.7	2.7	92.6						

% R – percent recovery (75-125)
Spike – matrix spike
Dup – sample duplicate
% RPD – relative percent difference
LCS – laboratory control sample