APPENDIX 4

COST ESTIMATES

Tenkiller Water Supply/Treatment
Wholesale Water Treatment and
Conveyance System, Phase 3
Tenkiller Lake Area
(Concept Design Estimate Only)

Designed By: Corps of Engineers, Tulsa Dist.
Estimated By: Tom Skelton

Prepared By: REVISED ESTIMATE - 3 MARCH 2000
FOR REVISED PLAN

Preparation Date: 03/03/00
Effective Date of Pricing: 03/03/00
Est Construction Time: 1200 Days

Sales Tax: 7.50%

This estimate is for two alternative plans for water treatment and distribution system around lake Tenkiller. The pipeline costs are based on ductile iron pipe and assume some rock excavation will be necessary. The water treatment buildings and booster pump stations were assumed to be preengineered metal buildings with standard concrete foundation and slab. Water treatment plant costs were determined using historical data from Black & Veatch. The intake structures were assumed to be the floating type.

The cost escalation assumes a start no sooner than Jan 2001 and a contract duration of 3 1/2 years. This give a midpoint of construction at about Sept 2002. Using tri-service index dated 10 Jan 2000 the index rates for Mar 2000 and Sep 2002 are 2081 & 2167 repectfully. This gives an escalation of 4.1 percent.

Contingencies were set at 5% for pipelines and water towers, and 10% for the structures since there are many various possible designs that may greatly impact costs. The costs and contingencies for real estate expenses were provided by the Acquisition and Realty Services Branch.

Revisions Dated 3 March 2000:
1. Added Alternative No. 3.
1. Revised various lengths of pipelines of different sizes of pipes on ech alternative.
3. Changed the pipe pressure rating to 350 psi instead of 250 psi. Note this only effected the cost of 16" and larger pipelines, since the smaller ductile iron pipe is normaly rated for 350 psi anyway.

		QUANTITY	UOM	CONTRACT	ESCALATN	CONTINGN	TOTAL COST	UNIT
A1	Alternative # 1							
A1.A1	6" Waterlines - D.I.	80256.00	LF	1,003,536	41,145	52,234	1,096,915	13.67
A1.A2	8" Waterlines - D.I.	182160	LF	3,143,642	128,889	163,627	3,436,158	18.86
A1.A3	10" Waterlines - D.I.	55440.00	LF	1,212,995	49,733	63,136	1,325,865	23.92
A1.A4	12" Waterlines - D.I.	183216	LF	4,966,915	203,644	258,528	5,429,087	29.63
A1.A5	16" Waterlines - D.I.	60720.00	LF	2,551,570	104,614	132,809	2,788,994	45.93
A1.A6	18" Waterlines - D.I.	140448	LF	8,276,990	339,357	430,817	9,047,164	64.42
A1.B1	500 GPM Booster Pump Station			68,488	2,808	7,130	78,426	
A1.B2	500 GPM Booster Pump Station			68,488	2,808	7,130	78,426	
A1.B3	2000 GPM Booster Pump Sta.			119,528	4,901	12,443	136,871	
A1.B4	2500 GPM Booster Pump Sta.			126,712	5,195	13,191	145,098	
A1.C1	Water Tower, 1,000,000 Gal 245'H			1,709,977	70,109	89,004	1,869,090	
A1.C2	Water Tower, 500,000 Gal, 145' H			806,742	33,076	41,991	881,809	
A1.C3	Water Tower, 500,000 Gal, 150' H			806,742	33,076	41,991	881,809	
A1.D1	Water Treatment Plant 3.5 MGD			3,089,634	126,675	321,631	3,537,940	
A1.D2	2500 GPM Water Intake Structure			71,488	2,931	7,442	81,861	
A1.D3	Water Treatment Plant 7.5 MGD			6,242,835	255,956	649,879	7,148,670	
A1.D4	5,200 GPM Water Intake Structure			106,467	4,365	11,083	121,916	
	TOTAL Alternative # 1			34,372,750	1,409,283	2,304,066	38,086,098	
A2	Alternative # 2							
A2.A1	6" DI Waterlines (Initial Const)	76560.00	LF	957,312	39,250	49,828	1,046,389	13.67
A2.A2	8" DI Waterlines (Initial Const)	161040	LF	2,779,179	113,946	144,656	3,037,782	18.86
A2.A3	10" DI Waterlines(Initial Const)	55440.00	LF	1,212,995	49,733	63,136	1,325,865	23.92
A2.A4	12" DI Waterlines(Initial Const)	44880.00	LF	1,216,693	49,884	63,329	1,329,906	29.63
A2.B1	6" DI Waterlines (Second Phase)	30096.00	LF	376,251	15,426	19,584	411,261	13.66
A2.B2	8" DI Waterlines (Second Phase)	21120.00	LF	364,483	14,944	18,971	398,398	18.86
A2.B4	12" DI Waterlines (Second Phase)	164736	LF	4,465,909	183,102	232,451	4,881,462	29.63
A2.B5	16" DI Waterlines (Second Phase)	60720.00	LF	2,551,570	104,614	132,809	2,788,994	45.93
A2.B6	18" DI Waterlines (Second Phase)	140448	LF	8,276,990	339,357	430,817	9,047,164	64.42
A2.C1	Water Tower, 1,000,000G 245'(P1)			1,709,977	70,109	89,004	1,869,090	
A2.C2	Water Tower, 500,000G, 145'H(P1)			806,742	33,076	41,991	881,809	
A2.C3	Water Tower, 500,000G, 150'H(P2)			806,742	33,076	41,991	881,809	
A2.D1	Water Treatment Plant 3.5 MGD-P1			3,089,634	126,675	321,631	3,537,940	
A2.D2	2400 GPM Intake Structure (Ph 1)			80,080	3,283	8,336	91,700	
A2.E1	500 GPM Booster Pump Station(P1)			68,488	2,808	7,130	78,426	
A2.E2	2500 GPM Booster Pump Sta. (Ph2)			126,712	5,195	13,191	145,098	
A2.E3	500 GPM Booster Pump Station(P2)			68,488	2,808	7,130	78,426	
A2.E4	2000 GPM Booster Pump Sta.(Ph 2)			119,528	4,901	12,443	136,871	
A2.E5	Water Treatment Plant 3.5 MGD-P2			3,089,634	126,675	321,631	3,537,940	
A2.E6	2500 GPM Intake Structure (Ph 2)			71,488	2,931	7,442	81,861	
A2.E7	Water Plant Exp 3.5-7.5 MGD (P2)			3,534,607	144,919	367,953	4,047,478	
A2.E8	Water Intake Exp 2400-5200gpm P2			71,488	2,931	7,442	81,861	
	TOTAL Alternative # 2			35,844,990	1,469,645	2,402,895	39,717,530	

Total Phase 1 13,198,907
Total Phase 2 26,518,623

		QUANTITY	UOM	CONTRACT	ESCALATN	CONTINGN	TOTAL COST	UNIT
A3	Alternative # 3							
A3.A1	6" Waterlines - D.I.	68640.00	LF	858,294	35,190	44,674	938,158	13.67
A3.A2	8" Waterlines - D.I.	182160	LF	3,143,642	128,889	163,627	3,436,158	18.86
A3.A3	10" Waterlines - D.I.	55440.00	LF	1,212,995	49,733	63,136	1,325,865	23.92
A3.A4	12" Waterlines - D.I.	150480	LF	4,079,434	167,257	212,335	4,459,025	29.63
A3.A6	24" Waterlines - D.I.	105072	LF	7,826,042	320,868	407,345	8,554,255	81.41
A3.A7	30" Waterlines - D.I.	140448	LF	14,846,638	608,712	772,767	16,228,117	116
A3.B1	500 GPM Booster Pump Station			68,488	2,808	7,130	78,426	
A3.B2	500 GPM Booster Pump Station			68,488	2,808	7,130	78,426	
A3.B3	2000 GPM Booster Pump Sta.			119,528	4,901	12,443	136,871	
A3.B4	10,000 GPM Booster Pump Sta.			449,438	18,427	46,786	514,651	
A3.C1	Water Tower, 1,000,000 Gal 245'H			1,709,977	70,109	89,004	1,869,090	
A3.C2	Water Tower, 500,000 Gal, 145' H			806,742	33,076	41,991	881,809	
A3.C3	Water Tower, 500,000 Gal, 150' H			806,742	33,076	41,991	881,809	
A3.D1	Water Treatment Plant 3.5 MGD			3,089,634	126,675	321,631	3,537,940	
A3.D2	2500 GPM Water Intake Structure			71,488	2,931	7,442	81,861	
A3.D3	Water Treatment Plant 19.5 MGD			10,997,812	450,910	1,144,872	12,593,595	
A3.D4	13,500GPM Water Intake Structure			282,658	11,589	29,425	323,671	
TOTAL	Alternative # 3			50,438,039	2,067,960	3,413,729	55,919,728	

	QUANTITY	UOM	** CONTRACT ** TOTAL	UNIT	** PROJECT ** TOTAL	UNIT
A1 Alternative # 1						
A1.A1 6" Waterlines - D.I.	80256.00	LF	1003536	12.50	1096915	13.67
A1.A2 8" Waterlines - D.I.	182160.00	LF	3143642	17.26	3436158	18.86
A1.A3 10" Waterlines - D.I.	55440.00	LF	1212995	21.88	1325865	23.92
A1.A4 12" Waterlines - D.I.	183216.00	LF	4966915	27.11	5429087	29.63
A1.A5 16" Waterlines - D.I.	60720.00	LF	2551570	42.02	2788994	45.93
A1.A6 18" Waterlines - D.I.	140448.00	LF	8276990	58.93	9047164	64.42
A1.B1 500 GPM Booster Pump Station	1.00	LS	68,488	68488	78,426	78426
A1.B2 500 GPM Booster Pump Station	1.00	LS	68,488	68488	78,426	78426
A1.B3 2000 GPM Booster Pump Sta.	1.00	LS	119,528	119528	136,871	136871
A1.B4 2500 GPM Booster Pump Sta.	1.00	LS	126,712	126712	145,098	145098
A1.C1 Water Tower, 1,000,000 Gal 245'H	1.00	LS	1709977	1709977	1869090	1869090
A1.C2 Water Tower, 500,000 Gal, 145' H	1.00	LS	806,742	806742	881,809	881809
A1.C3 Water Tower, 500,000 Gal, 150' H	1.00	LS	806,742	806742	881,809	881809
A1.D1 Water Treatment Plant 3.5 MGD	1.00	LS	3089634	3089634	3537940	3537940
A1.D2 2500 GPM Water Intake Structure	1.00	LS	71,488	71488	81,861	81861
A1.D3 Water Treatment Plant 7.5 MGD	1.00	LS	6242835	6242835	7148670	7148670
A1.D4 5,200 GPM Water Intake Structure	1.00	LS	106,467	106467	121,916	121916
A1 Alternative # 1	1.00	LS	34372750	34372750	38086098	38086098
A2 Alternative # 2						
A2.A1 6" DI Waterlines (Initial Const)	76560.00	LF	957,312	12.50	1046389	13.67
A2.A2 8" DI Waterlines (Initial Const)	161040.00	LF	2779179	17.26	3037782	18.86
A2.A3 10" DI Waterlines(Initial Const)	55440.00	LF	1212995	21.88	1325865	23.92
A2.A4 12" DI Waterlines(Initial Const)	44880.00	LF	1216693	27.11	1329906	29.63
A2.B1 6" DI Waterlines (Second Phase)	30096.00	LF	376,251	12.50	411,261	13.66
A2.B2 8" DI Waterlines (Second Phase)	21120.00	LF	364,483	17.26	398,398	18.86
A2.B4 12" DI Waterlines (Second Phase)	164736.00	LF	4465909	27.11	4881462	29.63
A2.B5 16" DI Waterlines (Second Phase)	60720.00	LF	2551570	42.02	2788994	45.93
A2.B6 18" DI Waterlines (Second Phase)	140448.00	LF	8276990	58.93	9047164	64.42
A2.C1 Water Tower, 1,000,000G 245'(P1)	1.00	LS	1709977	1709977	1869090	1869090
A2.C2 Water Tower, 500,000G, 145'H(P1)	1.00	LS	806,742	806742	881,809	881809
A2.C3 Water Tower, 500,000G, 150'H(P2)	1.00	LS	806,742	806742	881,809	881809
A2.D1 Water Treatment Plant 3.5 MGD-P1	1.00	LS	3089634	3089634	3537940	3537940
A2.D2 2400 GPM Intake Structure (Ph 1)	1.00	LS	80,080	80080	91,700	91700
A2.E1 500 GPM Booster Pump Station(P1)	1.00	LS	68,488	68488	78,426	78426
A2.E2 2500 GPM Booster Pump Sta. (Ph2)	1.00	LS	126,712	126712	145,098	145098
A2.E3 500 GPM Booster Pump Station(P2)	1.00	LS	68,488	68488	78,426	78426
A2.E4 2000 GPM Booster Pump Sta.(Ph 2)	1.00	LS	119,528	119528	136,871	136871
A2.E5 Water Treatment Plant 3.5 MGD-P1	1.00	LS	3089634	3089634	3537940	3537940
A2.E6 2500 GPM Intake Structure (Ph 2)	1.00	LS	71,488	71488	81,861	81861
A2.E7 Water Plant Exp 3.5-7.5 MGD (P2)	1.00	LS	3534607	3534607	4047478	4047478
A2.E8 Water Intake Exp 2400-5200gpm P2	1.00	LS	71,488	71488	81,861	81861
A2 Alternative # 2	1.00	LS	35844990	35844990	39717530	39717530
A3 Alternative # 3						
A3.A1 6" Waterlines - D.I.	68640.00	LF	858,294	12.50	938,158	13.67
A3.A2 8" Waterlines - D.I.	182160.00	LF	3143642	17.26	3436158	18.86

	QUANTITY	UOM	** CONTRACT ** TOTAL	UNIT	** PROJECT ** TOTAL	UNIT
A3.A3 10" Waterlines - D.I.	55440.00	LF	1212995	21.88	1325865	23.92
A3.A4 12" Waterlines - D.I.	150480.00	LF	4079434	27.11	4459025	29.63
A3.A6 24" Waterlines - D.I.	105072.00	LF	7826042	74.48	8554255	81.41
A3.A7 30" Waterlines - D.I.	140448.00	LF	14846638	105.71	16228117	115.55
A3.B1 500 GPM Booster Pump Station	1.00	LS	68,488	68488	78,426	78426
A3.B2 500 GPM Booster Pump Station	1.00	LS	68,488	68488	78,426	78426
A3.B3 2000 GPM Booster Pump Sta.	1.00	LS	119,528	119528	136,871	136871
A3.B4 10,000 GPM Booster Pump Sta.	1.00	LS	449,438	449438	514,651	514651
A3.C1 Water Tower, 1,000,000 Gal 245'H	1.00	LS	1709977	1709977	1869090	1869090
A3.C2 Water Tower, 500,000 Gal, 145' H	1.00	LS	806,742	806742	881,809	881809
A3.C3 Water Tower, 500,000 Gal, 150' H	1.00	LS	806,742	806742	881,809	881809
A3.D1 Water Treatment Plant 3.5 MGD	1.00	LS	3089634	3089634	3537940	3537940
A3.D2 2500 GPM Water Intake Structure	1.00	LS	71,488	71488	81,861	81861
A3.D3 Water Treatment Plant 19.5 MGD	1.00	LS	10997812	10997812	12593595	12593595
A3.D4 13,500GPM Water Intake Structure	1.00	LS	282,658	282658	323,671	323671
A3 Alternative # 3	1.00	LS	50438039	50438039	55919728	55919728
Tenkiller Water Supply/Treatment	1.00	LS	120655779	********	133723356	********

SRC LABOR ID	DESCRIPTION	BASE	OVERTM	TXS/INS	FRNG	TRVL	RATE	UOM	UPDATE	**** TOTAL **** DEFAULT	HOURS
MIL B-CARPNTER	Carpenters	14.08	0.0%	38.0%	3.07	0.00	22.50	HR	03/02/00	15.82	95
MIL B-CEMTFINR	Cement Finishers	13.60	0.0%	38.0%	3.07	0.00	21.84	HR	03/02/00	16.63	182
MIL B-ELECTRN	Electricians	16.75	0.0%	39.0%	4.24	0.00	27.52	HR	03/02/00	23.41	3789
MIL B-EQOPRCRN	Eq Oper, Crane/Shovl	9.05	0.0%	41.0%	0.00	0.00	12.76	HR	03/02/00	21.34	7750
MIL B-EQOPRLT	Eq Oper, Light	7.45	0.0%	41.6%	0.00	0.00	10.55	HR	03/02/00	10.42	7750
MIL B-EQOPRMED	Eq Oper, Medium	8.40	0.0%	41.6%	0.00	0.00	11.89	HR	03/02/00	14.16	13339
MIL B-EQOPROIL	Eq Oper, Oilers	11.28	0.0%	41.6%	0.00	0.00	15.97	HR	07/01/98	14.16	7750
MIL B-LABORER	Laborer (Semi-Skilled)	6.25	0.0%	38.0%	0.00	0.00	8.63	HR	03/02/00	10.00	86246
MIL B-PLUMBER	Plumbers	13.25	0.0%	38.6%	0.74	0.00	19.10	HR	03/02/00	28.80	1278
MIL B-POWDERMN	Powderman	12.00	0.0%	57.9%	0.00	0.00	18.95	HR	03/02/00	13.42	934
MIL B-SHTMTLWK	Sheet Metal Workers	15.44	0.0%	38.0%	4.77	0.00	26.08	HR	03/02/00	28.96	200
MIL B-STM/PIPE	Steam/Pipefitters	13.25	0.0%	38.6%	0.74	0.00	19.10	HR	03/02/00	28.33	1663
MIL B-STRSTEEL	Struct Stl Workers	13.30	0.0%	66.6%	3.27	0.00	25.43	HR	03/02/00	24.98	46500
MIL B-WELDERS	Welders, Struct Stl	13.30	0.0%	44.6%	3.27	0.00	22.50	HR	03/02/00	21.74	15500
MIL X-EQOPRMED	Outside Equip. Op. Medium	8.40	0.0%	41.6%	0.00	0.00	11.89	HR	03/02/00	11.89	128786
MIL X-LABORER	Outside Laborer (Semi-Skilled)	6.25	0.0%	41.6%	0.00	0.00	8.85	HR	03/02/00	8.43	365855
MIL X-PLUMBER	Outside Plumber	7.50	0.0%	38.0%	0.00	0.00	10.35	HR	03/02/00	29.36	182948

** CONTRACTOR SETTINGS **

		AMOUNT	PCT	PCT S	RISK	DIFF	SIZE	PERIOD	INVEST	ASSIST	SUBCON
AA Prime (Mechanical)											
OVERHEAD	P		10.00								
HOME OFC	P		3.00								
PROFIT	P		10.00								
BOND	P		1.00								
SC Subcontractor											
OVERHEAD	P		15.00								
HOME OFC	P		0.00								
PROFIT	P		10.00								
BOND	P		0.00								