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APPENDICES

WATER QUALITY MANAGEMENT IN UTAH MOUNTAIN WATERSHEDS

By

Keith R. Kimball, Graduate Student

and

E. Joe Middlebrooks, Project Leader

PROJECT COMPLETION REPORT

Utah Water Research Laboratory
Utah State University
Logan, Utah 84322-8200

December 1986

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Appendix A

Climatological Data Little Cottonwood Canyon

1974-1975

Table A-1. Alta 1974 daily temperature (high - low).

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	Missing	33 21	33 20	31 16	49 27	54 34	74 53	71 48	73 44	64 39	34 27	44 19
2		25 11	33 21	32 24	52 35	61 38	72 46	74 45	70 39	65 41	37 25	47 23
3		25 7	32 8	31 12	41 29	65 40	65 33	72 46	62 40	59 40	38 23	46 24
4		30 10	21 -3	26 9	43 32	66 40	68 43	68 48	67 44	51 26	36 15	41 24
5		36 6	20 0	31 8	51 36	60 40	74 50	69 45	74 49	42 26	37 15	37 23
6		15 0	31 20	50 19	59 37	40 31	72 52	73 45	68 44	42 23	37 14	25 10
7		22 3	34 25	31 18	56 36	45 31	70 53	71 42	67 44	52 34	40 18	33 10
8		19 -2	47 28	43 17	53 39	39 22	70 48	68 43	72 46	55 37	52 28	25 11
9		32 6	50 32	52 24	60 41	44 27	68 51	64 42	73 48	59 35	41 25	35 11
10		37 16	44 26	44 15	55 35	55 39	71 50	54 37	75 49	51 32	30 16	44 14
11		42 19	36 21	28 10	41 30	60 41	68 33	62 37	74 35	49 34	27 17	32 11
12		42 16	44 24	31 13	56 39	64 45	62 36	70 44	74 25	52 34	43 24	27 15
13		39 15	45 30	21 11	55 21	75 48	74 49	69 47	52 31	51 30	48 35	32 12
14		36 11	37 26	31 14	29 22	78 50	77 52	71 46	55 35	49 31	41 25	13 5
15		38 12	46 20	41 14	44 27	82 54	80 54	64 44	55 32	50 31	44 27	22 6
16		35 18	46 26	48 16	40 22	80 50	67 48	70 49	61 38	53 37	42 21	25 6
17		42 16	44 35	42 17	46 28	73 50	62 48	73 48	66 39	60 43	45 26	30 18
18		22 5	50 25	53 25	55 36	75 48	68 50	73 50	69 40	62 40	37 26	32 6
19		26 5	34 24	52 30	46 32	76 47	67 49	76 55	64 43	66 44	29 19	25 14
20		26 9	35 4	44 23	47 18	73 50	68 47	72 32	70 42	64 42	32 13	25 14
21		15 2	33 6	38 23	32 21	66 38	70 47	56 33	72 43	63 28	49 26	33 22
22		34 4	30 4	41 28	44 28	66 46	75 50	61 40	64 43	36 21	50 35	34 4
23		21 1	30 17	56 29	55 35	72 48	75 48	70 48	67 41	44 23	38 10	7 -4
24		14 0	32 11	57 37	58 37	75 48	75 49	74 46	66 40	46 34	34 14	15 -9
25		31 2	37 20	57 33	59 40	76 51	71 48	75 48	66 43	48 36	46 22	13 -3
26		38 20	45 29	55 26	60 41	74 44	74 49	75 49	65 39	51 33	40 17	24 5
27		40 22	42 26	37 18	68 45	69 46	77 50	74 48	72 27	50 31	35 17	31 7
28		33 20	40 29	38 13	72 44	73 47	76 50	75 49	38 26	43 30	41 13	35 10
29			32 20	37 22	66 46	71 46	75 47	76 48	52 28	42 29	28 7	35 8
30			40 24	45 24	59 31	69 47	76 52	74 47	62 36	37 23	32 7	23 2
31			40 20		54 33		74 47	74 46		34 25		28 3
Ave.		30.3 9.8	37.5 19.9	40.8 19.6	51.8 33.0	65.9 42.9	71.5 47.8	69.9 45.0	65.5 39.1	51.3 32.6	38.8 20.2	29.6 10.4

Data Source: Climatological Data (1974, 1975).

Table A-2. Cottonwood weir 1974 daily temperature (high - low).

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	24 4	42 35	62 40	51 36	76 53	79 54	96 69	90 67	86 68	80 57	51 38	44 24
2	21 -2	39 27	61 28	50 30	73 53	85 57	92 60	86 65	83 55	83 59	55 35	47 25
3	23 -1	47 30	42 24	42 24	60 45	85 60	83 64	87 62	81 57	81 47	53 42	60 30
4	33 6	52 28	37 15	45 23	70 42	78	95 62	89 63		62	51 40	57 47
5	33 22	49 22	51 22	58 36	77 46	69 47	97 70	91 66	83 61	58	50 34	48 33
6	37 19	34 10	54 33	62 37	79 51	66		90 65	89 60	61 33	51 37	47 28
7	34 21	33 16	56 40	52 35	77 50	68 37	89 74	85 57	85 63	69 38	57 34	46 28
8	29 7	35 12	53 39	71 38	85 55	72 35	89 69	82 57	83 69	74 48	52 39	38 20
9	20 7	37 20	51 29	73 49	82 58	75 37	89 70	80 56	83 66	70 44	47	47
10	32 7	39 11	54 34	53 30	79 49	80 37	89 72	80 53		69 48	48 33	17
11	34 13	45 13	57 39	46 34	73 51	89 49	92 62	80 59	45	67 41	53 28	34 23
12	43 20	49 24	63 39		80 57	95 61		86 66	69 39	65 42	57 34	44 29
13	44	45 27	63 43	45	80 37	96 69	98 70	89 67	71 41	64 45	59 40	45 26
14	33	46 25	62 37	51 33		101 69	98 73	86 58	66 46	67 48	60 41	35 20
15	55 35	47 23	61 37	56 34	63 40	99 70	87 68	85 60	69 47	70 51	59 39	36 29
16	55	55 31	65 41	61 40	63 35	100 67	80 63	91 60	74 49	71 53	55 36	40 30
17	49 34	56 29	65 49	70 45	77 42	96 64	88 60	92 67	78 56	74 50	56 37	40 27
18	41 33	42 20	63 36	70 50	74 50	99 61	89 59	94 68	76 54	71 53	57 36	37 25
19		42 30	54 32	68 50	58 39	97 61	93 67	91 75	80 55	74 47	58 33	37 12
20	41 36	33 21	54 22	52 37	61 37	93 58	90 61	76 46	78 50	76 50	59 32	39 14
21	37 22	40 18	50 23	57 37	74 43	85 56	90 64	80 53	79 53	68 35	65 44	55
22	34 15	44 25		73 44	75 49	90 65	96 71	88 56	78 50	57 36	66 34	53 21
23	37 19	39 15	53 34	75 54	79 55	96 64	93 69	92 64	77 58	62 47	50 29	22 11
24	39 21	36 15	57 38	77 53		99 64	92 70	91 68	76 50	62 42	50 31	23 9
25	36 21	45 15	65 41	77 49	82 48	96 65	93 69	91 67	77 57	65 41	62 43	24 12
26	36 22	52 28	65 38	71 40	86 56	92 58	95 68	92 67		67 43	47 30	32 9
27	33 24	55 28	58 41	51 34	88 63	93 56	92 71	92 68	45	63 46	41 28	36 15
28	38 25	60 37	57 39	50 35	89	93 65	94 67	93 69	69 44	60 40	41 26	40 30
29	45 26		57 37	62 40	83 54	92 61	95 68	88 67	77 47	45 35	43 28	32 22
30	52 33		63 45	72 45	82 57	93 66	92 72	88 66	80 54	47 37	44 25	27 12
31	51 34		60 35		80 48		92 65	91 65				31 14
Ave.	37.4 19.9	44.2 22.7	57.1 35.0	60.1 39.0	76.0 48.7	88.4 57.6	91.7 67.1	87.9 62.8	77.9 53.3	66.7 44.9	53.2 34.7	39.9 22.1

Table A-3. Alta 1974 daily precipitation.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	missing	0.23									0.41	
2		0.56	0.11	1.45				0.28			0.17	
3		0.06	1.31	1.21			0.23				0.23	
4			(0.63)	0.51						0.13		0.09
5		0.93				0.31				0.31		0.84
6		1.01		0.13						0.01		0.09
7		0.51		0.43		0.23		0.25				0.81
8						0.75		0.13			0.06	0.02
9										0.21		
10				1.73								
11			0.40	1.75							0.06	
12				0.84					0.16			0.47
13		T		1.34								0.74
14												1.83
15			0.10									0.46
16			0.20				0.05					0.57
17		0.27					0.17					
18		0.81					0.13				0.01	1.13
19		0.27	0.46								0.67	0.44
20		0.19		1.33	0.36						0.02	1.41
21				0.15	0.45		0.15			0.04		1.23
22										0.35		0.13
23		1.04	0.40								0.69	0.67
24		T								0.33		
25												
26											T	
27			0.93	0.73	T							
28		T	T	0.14					0.10	0.07	0.09	T
29			0.23	0.07						0.46		
30			0.11							0.23		T
31			0.94				0.22			1.21		T
Total		5.88	5.82	11.81	0.81	1.29	0.95	0.66	0.26	3.35	2.41	10.93

Table A-4. Cottonwood weir 1974 daily precipitation.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.03	T	T							0.02	
2		0.03	0.56	0.95			0.06					
3			0.22	0.35	T	T	0.10					
4			0.03	T		0.01				0.51		T
5	–[a]	0.95				0.09				0.18		0.58
6	0.09	0.02		0.14		T				0.01		
7	0.02	0.12				0.25						0.54
8	0.19					0.22		T			T	
9	T			T						0.17	0.02	
10				1.50		0.03						
11			T	0.62					T			
12	0.05			0.79					0.03			T
13				0.25								0.48
14												T
15			0.05						0.07			0.07
16							0.06					T
17	0.20	0.43										0.02
18			0.12								0.18	
19	0.12	0.19			0.14							
20	0.11	0.32		0.75	0.46		T					0.13
21	0.70									0.70	T	0.01
22	0.02	0.15								0.15	0.69	0.10
23	0.04	0.06								0.16	T	T
24	0.03									0.53		
25	T									T		
26	0.12			T								0.01
27	0.04		(0.16)	T					–			
28	–			0.01							T	
29			T	T						0.28		0.07
30			T							0.22		
31			T							0.54		T
Total	–	2.30	1.14	5.36	0.60	0.60	0.22	T	–	3.45	0.91	2.01

[a]Indicates no record on a day when other stations recorded precipitation.

Table A-5. Alta 1975 daily temperature (high - low).

Day	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.	Nov.		Dec.	
1	29	-1	19	10	37	27	22	4	45	24	54	40	75	48	59	36	70	45	Missing	38	28	30	-3
2	30	1	30	11	53	25	20	4	49	30	62	44	76	54	58	37	66	32		43	22	35	25
3	20	-1	34	19	43	23	30	7	54		63	38	80	49	64	40	64	32		52	26	30	28
4	29	6	27	11	37	19	36	28	41	18	46	32	76	48	72	47	69	40		48	20	52	28
5	16	8	23	7	42	25	35	26	27	18	50	32	77	49	77	50	64	42		49	25	38	30
6	26	7	13	1	40	26	34	26	29	19	66	43	73	50	75	54	72	42		62	43	35	30
7	27	10	28	5	30	27	30	16	28	22	69	39	74	52	74	55	70	43		47	36	42	24
8	31	15	30	22	39	30	19	6	29	23	52	35	80	56	62	41	68	44		40	22	40	15
9	27	0	31	24	40	21	31	18	43	27	41	29	81	51	70	40	66	46		25	7	43	29
10	10	-3	29	21	34	19	30	16	52	36	45	29	77	50	73	48	69	48		30	11	37	30
11	9	0	22	11	35	14	38	19	60		47	32	74	50	74	50	62	44		32	8	45	21
12	10	-7	33	12	32	7	42	20	58	27	66	42	63	53	74	48	65	42		11	0	41	27
13	27	7	42	15	31	8	42	20	45	28	68	44	71	47	66	42	65	42		43	11	28	15
14	37	22	33	15	32	12	40	22	59	25	62	48	69	48	65	46	65	40		56	30	18	0
15	39	26	37	13	37	10	38	28	66		58	41	74	55	68	42	60	41		57	30	7	-8
16	40	22	34	6	40	14	37	23	64	42	63	41	73	59	67	45	64	43		55	34	22	
17	40	15	27	7	28	14	30	17	64	39	63	40	64	46	69	48	62	44		53	25		7
18	36	25	20	-3	36	14	32	18	55	37	57	29	69	48	70	50	58	38		35	8	30	12
19	34	19	24	0	40	25	29	19	53	38	38	27	72	46	67	52	51	27		26	10	38	18
20	43	22	31	13	47	27	43	24	50	19	43	29	76	50	63	43	51	28		27	2	40	20
21	37	10	14	0	47	17	38	21	41	22	50	38	77	53	61	40	50	30		28	10	42	25
22	38	5	13	-6	36	19	49	22	41	19	48	36	74	52	58	41	54	32		23	8	33	14
23	41	15	22	7	21	14			44	28	64	42	75	49	61	43	60	39		39	20	35	12
24	40	18	40	19	20	14			48	34	64	44	73	48	66	42	63	40		26	13	28	6
25	32	25	45	18	31	16			51	16	66	31	74	50	54	36	63	38		25	6	26	8
26	40	27	41	15	34	12			55	25	55	26	76	49	63	40	58	39		10	3	21	13
27	41	7	41	12	19	3			55	31	62	40	76	52	72	47	59	36		19	10	34	19
28	18	2	34	24	14	-7	26	15	44	32	68	40	78	50	66	43	58	36		19	16	20	0
29	16	-5			16	-6	21	12	44	32	66	50	78	53	65	39	62	36		18	-3	25	0
30	21	0			24	9	40	17	52	34	70	46	62	50	67	44	54	36		3	-7	33	17
31	26	2			32	18			52	38			66	39	70	45						30	-5
Ave.	29.4	9.6	29.2	11.0	33.8	16.0	33.3	18.0	48.3	28.0	57.5	37.6	73.6	50.1	66.8	44.3	62.1	38.8		34.6	15.8	32.6	15.2

Table A-6. Cottonwood weir 1975 daily temperature (high - low).

Day	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
1	32	9	48	27	66	32	36	22	60	40					80	56	90	66	75	54	54	30	48	31
2	28	13	50	27	62	40	42	21	63	39	84	61	95	65	85	57	89	50	77	56	61	35	54	36
3	34	11	48	37	56	33	55	34	72	49	73	52	90	68	91	64	82	53	81	56	63	42	53	36
4	45	20	39		60	38	55	41	71	32	70	49	90	61	96	70	80	53	80	59	65	37	56	32
5	35	23		23	57	43	60	40	55	29	80	55	92	63	96	71	80	52	82	55	64	36	54	38
6			37	21	50	35	59	32	45	32	87	62	92	68	95	75	86	64	81	58	68	47	52	39
7	44	30	42	20	55	37	40	28	43	34	86	58	95	70	94	71	86	58	77	35	51	41	55	35
8	43	30	49	30	68	40	41	28	59	36	66	50	95	75	87	60	83	59	53	33		35	55	35
9	37	18	50	38	52	34	45	30	69	35	65	49	95	68	92	68			68	40		25	56	34
10	33	11	44	31	46	33	48	32	74	48			89	68	92	71			73	53		27	51	32
11	24	15	46	28	42	30	54	36	78	55			82	66	91	68	78	57	73	53	35	26	53	35
12	25	4	60	36	44	28	56	33	77	43	86	60	88	64	85	62	78	55	54	35		25	52	34
13	30	11	53	39					72	43	85	61	87	60	84	63	73	61	53	38	49	26	35	23
14	35	14	43	30	46	33			81	51	82	68	92	66	85	62	79	54	50	35		29	40	13
15	41	11	44	26	49	30			80		87	60	91	69	84	59	82	60	61	36	58		33	13
16	43	23	38	26	46	29	43	32		60	85	61	90	68	88	58	83	61	65	42	55	35	43	22
17	45	25	36	11	40	24	39	31	77	52	73	54	88	63	88	63	82	53	71	49		24	37	23
18	48	31	37	17	58	33	45	30	77	55	69	40	88	65	87	62	77	46	71	51			36	19
19	46	27	45	22	65	43	53	33	75	55	61	40	93	68	87	66			68	42	36	20	34	16
20			44		63	39	52	40	57	32			96	71	78	59	68	47	70	50	33	21	34	15
21	39	20		16	50	25	67	39	50	33	65	50	95	70	70	52	71	46	73	51				15
22		16	28	5			67	42		35	76	52	91	66	82	57	77	50	74	34	37	16	35	
23	39	19	38	14	39	25	57	43			83	61	93	68	85	65	79	57	43	27	36	27	30	22
24	44	31	43	18	46	27	69	39	73		84	60	90	65	85	55	80	58	38	22	45	30	37	20
25	57	23	44	20	50	36	68	31	74	30	80	42		70	81	54	82	57	49	21	40	26	36	29
26	55	32	47	21	47	22	43	27	70	43	78	46		70	90	65	80	58	69	40	39	20	41	26
27	33	21	49	27			43	31	65	46	81	64		73	89	66	76	53	53	31	38	29	44	28
28			51	38	28	10	40	30	61	44	82	53	94	72	89	67	78	54	54	34	39	25	41	18
29					34	13	48	28	70	47	87	59	89	65	84	57	77	55			31	14	37	17
30					50	23	54	32	73	50	90	64	86	62	88	64			68		39	14	32	21
31	32	11			48	29			73	54			85	50	88	63				43			25	16
Ave.	38.7	19.2	44.3	24.9	50.6	30.9	51.1	32.8	67.6	42.9	78.7	55.0	90.8	66.6	87.0	62.9	79.8	55.3	65.7	42.5	47.1	28.2	43.0	25.8

Table A-7. Alta 1975 daily precipitation.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.21								missing		0.14
2	0.01			0.15								0.10
3			T								0.47	
4	0.09	0.37				0.61	T				0.27	
5	0.77	0.55										
6	0.27	0.32	0.67		1.27							
7	1.13	T	0.97	0.03	2.10	0.15		0.02			0.42	
8	0.31				1.19	0.33					1.34	
9	0.97	0.77	0.41	0.03			0.05				0.15	
10	0.67		0.27	0.04		0.01	0.12		0.22			
11	2.13	1.21		0.09			T		0.32		0.88	
12	0.27	0.03	0.21		0.05		0.57	0.01	0.11		0.14	0.10
13			T					0.10	0.19			2.00
14		0.47	0.84						0.02			1.36
15		0.15		0.31					0.08			
16		0.09		1.63								
17	T	0.51	T	1.53			0.23					
18		0.13		1.14		0.43			—[a]		0.23	
19				0.15		0.73						
20		0.63	T		1.31	0.31		0.12				
21	0.14	1.09	0.39	0.05	0.44	0.51		0.05			0.32	
22		0.03	2.21		0.04	0.27		0.13				
23		T	2.55			1.33						
24	0.12		0.62			T						
25	1.26		0.04		T	T					0.17	0.32
26			1.31	0.61		0.02						
27	0.29	0.06	2.74	0.19							1.17	0.66
28	0.53	0.29	0.07	0.71				T			0.90	
29				0.83			0.08				2.24	
30			T				0.26				0.70	
31	0.26		0.41									0.55
Total	9.22	6.91	13.71	7.49	6.40	4.70	1.62	0.43	–		9.40	5.23

[a]Indicates no record on a day when other stations recorded precipitation.

Table A-8. Cottonwood weir 1975 daily precipitation.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				—[a]								T
2	0.08											
3												
4	T				0.30							
5	T	0.20			0.56							
6	T		T	0.10	0.03	T					T	
7			0.13	0.04	0.65	T				0.41	0.08	
8	0.70	0.08		T	0.25	0.16				0.55	0.13	
9	0.14		0.34									
10	0.07	0.12	0.08	T					0.13			
11	0.07	0.07					T	T			T	
12							T	T	T	0.25		0.02
13		T						T	0.17			1.45
14		0.18							T	0.51		0.11
15			T	0.50				0.05		T		
16		T	T				T					
17		0.22	0.55	0.19							T	
18				0.11		1.02					0.52	
19					T			0.04				
20		0.31		0.02	1.34	T						
21		0.15	0.59		0.24	T					0.06	
22			0.64	T	T			0.13		0.22		T
23				0.04								
24	T		0.05							T		
25	0.14			0.31	0.18	0.02					T	0.10
26			1.03	0.35				T			T	
27		0.01	T							0.67	0.50	0.03
28	0.31	T	T	0.20	T						0.20	
29							0.07				0.72	
30											T	0.21
31	0.03						0.08					T
Total	1.54	1.34	3.41	–	3.55	1.20	0.15	0.22	0.30	2.61	2.21	1.92

[a]Indicates no record on a day when other stations recorded precipitation.

Table A-9. Alta 1974 snowfall - snow on ground.[a]

Day	Feb.		Mar.		Apr.		May		June		Sept.		Oct.		Nov.		Dec.	
1	2.1	84		90		75		102		5					4.6	15		9
2	7.2	90	1.2	90	14.6	89		100		1					0.2	14		7
3	1.1	90	11.0	100	14.5	103		98							0.2	13		5
4		89	5.5	103	5.9	107		96								12	1.0	6
5	10.0	98	2.0	103		106		94					2.3	2		11	7.9	13
6	11.0	108		101	1.1	106		92								10	1.1	13
7	5.9	112		100	5.1	110		90	T							8	9.4	21
8		110		94		108		88	6.3	6					0.5	8	1.5	21
9		108		88		106		85		2						7		20
10		106		84	15.7	120		81								6		19
11		104	4.0	87	13.0	130		77							0.5	6		18
12		102		82	7.9	134		73			T	T				5	5.5	23
13	T	100		77	11.8	143		70								4	6.5	29
14		98		72		140		66								4	21.2	47
15		96	1.0	73		136		62								3	4.1	48
16		94	2.0	74		131		58								3	6.3	52
17	3.1	91		73		128		53								3		51
18	7.3	96		71		124		48							0.1	T	9.4	58
19	3.1	98	4.0	74		121		43							7.0	7	3.9	61
20	2.1	97		72	11.5	130	3.1	42							0.2	6	15.3	71
21		96		70	1.3	128	4.1	44					(3.5)	T		5	10.6	79
22		95		68		125		40						4		4	1.7	77
23	10.1	103	4.0	66		120		35							7.7	11	5.3	79
24	T	100		64		116		31								11		78
25		97		62		111		27								11		77
26		96		62		106		24							T	10		76
27		93	7.0	68	7.1	111		21								10		75
28	T	90	T	68	1.2	110		18			1.1	1	0.1	T	1.1	11	T	74
29			2.0	69	0.6	110		15					4.1	4		10		73
30			1.0	70		106		12					2.1	5		10	T	72
31			7.8	76				9					10.9	14			T	71

[a]January data not reported, no snowfall recorded for July and August.

Table A-10. Alta 1975 snowfall - snow on ground.[a]

Day	Jan.		Feb.		Mar.		Apr.		May		June		July		Nov.		Dec.	
1		70	3.2	101		105		148		135		101		5		15	3.0	70
2	0.2	69		100		104	1.3	147		133		99				15	1.0	64
3		68		99	T	100		145		132		96			6.0	21		60
4	1.1	68	5.3	102		97		143		131		94			4.0	22		58
5	7.1	74	10.6	109		94		141	6.3	136		90				21		55
6	2.3	74	4.1	110	6.1	98		139	9.7	144		87				20		50
7	8.2	81	T	108	8.1	104	0.3	137	13.3	155		84			5.0	25		46
8	2.3	80	2.3	107		102		135	9.3	163		80			9.0	30		44
9	8.3	87	T	104	5.3	105	0.3	133		160		77			1.0	29		43
10	5.3	89	7.1	108	4.1	107	0.4	131		155	0.1	75				27		40
11	17.7	105	10.3	114		105	1.1	129		149		72			12.0	38		40
12	2.1	101	0.2	110	3.7	107		126	0.4	145		68			5.0	40	1.0	40
13		100		107		105		124		139		66				38	24.0	64
14		99	5.2	110	7.3	110		121		135		62				30	12.0	69
15		98	2.1	110		108	3.6	123		130		60				29		66
16	T	97	1.1	111		106	10.3	130		125		59				27		64
17		96	7.3	117	T	104	13.3	140		121		58				25		63
18		95	1.5	117		102	8.3	145		119	2.9	57			5.0	29		–
19		94		116		100	1.3	144		116	3.1	55				26		62
20		93	7.4	121	T	97		141	11.7	124	1.1	54				25		60
21	1.3	93	12.3	129	4.1	100	0.5	139	4.4	126		53			6.0	29		58
22		92	0.4	127	18.1	116		136	0.4	125		52				26		57
23		91	T	125	22.3	136		133		123		51				25		56
24	1.5	91		121	5.6	137		130		121		46				25		–
25	6.0	96		118	0.5	135		126	T	120	T	40			3.0	24	2.0	–
26		94		114	10.1	142	5.3	128		117	0.1	34				23		56
27	3.4	96	0.6	111	23.1	160	1.7	128		114		28			22.0	40	4.0	59
28	6.1	101	2.1	109	0.6	155	8.3	134		111		21			15.0	55		58
29		98				153	10.3	140		108		15			24.0	68		56
30		97			T	150		136		105		10			6.0	72		55
31	4.2	100			3.2	150				103							9.0	64

[a]October data not reported, no snowfall recorded for August and September.

Appendix B

Daily Streamflow Data for Sites 9 and 10

1974-1975

Table B-1. Little Cottonwood Creek Site 9 daily streamflow in second-feet, 1974.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.8	16.8	12.7	28.2	70.0	375.8	157.4	44.8	27.3	16.6	17.2	12.9
2	14.1	16.3	16.4	28.2	82.7	375.8	149.2	43.8	27.3	18.0	18.1	14.0
3	13.4	16.1	17.4	26.9	89.3	379.3	133.5	42.6	27.3	20.2	17.6	14.6
4	13.6	16.3	16.2	23.5	95.9	377.4	125.4	40.3	26.8	21.2	17.2	14.3
5	15.8	14.9	17.0	20.7	126.0	371.3	119.6	38.9	26.8	21.4	16.7	15.0
6	15.9	15.6	17.1	21.0	162.3	316.6	113.8	38.2	26.5	20.0	16.3	14.2
7	18.6	16.1	17.1	19.9	199.7	245.7	109.8	41.0	26.4	19.1	16.3	14.0
8	18.3	16.1	17.2	22.2	253.9	200.6	102.3	42.3	26.4	17.7	16.7	12.0
9	18.1	15.6	17.3	20.1	296.6	171.6	101.0	43.6	26.3	19.2	16.8	11.3
10	17.7	15.7	18.2	21.3	342.7	178.3	98.1	42.3	25.8	17.9	16.2	11.6
11	17.4	15.6	17.7	21.3	291.7	224.2	93.7	41.7	26.0	17.3	16.1	11.9
12	17.9	15.7	18.8	22.5	280.4	290.7	92.4	49.1	26.0	17.1	16.1	13.7
13	17.7	15.6	19.9	22.5	251.9	361.2	82.2	39.0	25.7	17.0	16.0	13.0
14	17.5	15.6	20.2	21.9	225.4	399.2	77.7	33.7	25.7	16.6	15.3	14.3
15	18.1	15.6	20.1	22.5	226.1	407.2	77.3	33.5	25.8	16.4	15.7	15.2
16	18.0	15.6	21.5	23.2	232.9	404.1	78.1	33.1	16.8	15.8	15.5	15.3
17	19.3	16.5	24.2	23.2	240.9	388.9	76.9	32.5	16.8	15.7	15.7	14.8
18	19.2	16.1	25.8	26.0	236.7	368.5	74.5	37.8	16.8	15.3	15.9	14.5
19	18.4	16.5	25.5	27.4	209.7	350.3	71.5	38.0	16.6	15.4	15.8	14.6
20	18.3	16.6	25.7	31.9	178.3	321.7	69.5	39.0	16.6	15.0	15.8	14.9
21	18.3	15.8	25.5	30.3	153.9	281.1	66.5	39.1	16.5	18.8	15.2	15.0
22	15.6	16.7	25.6	31.1	139.4	257.9	62.5	39.9	16.5	17.6	16.5	13.7
23	16.3	16.5	25.5	35.1	139.2	246.9	58.5	38.0	16.5	17.8	15.7	13.1
24	17.5	15.2	25.9	45.5	167.7	248.0	50.3	36.3	16.5	18.5	15.7	11.8
25	17.4	16.6	26.9	59.5	240.9	248.7	56.5	33.0	16.5	17.6	15.0	12.4
26	17.7	16.2	27.8	72.5	331.6	229.2	53.5	31.7	15.6	17.8	14.9	13.8
27	17.0	16.2	27.8	68.5	426.9	205.9	51.9	32.0	16.5	18.4	14.7	14.0
28	17.4	16.3	28.5	64.5	465.8	184.1	50.3	31.1	16.2	17.6	14.7	13.7
29	17.0		29.3	61.5	446.4	174.9	48.9	30.4	16.2	17.9	13.2	13.5
30	16.5		26.6	61.5	403.9	166.4	47.1	29.6	16.2	17.7	12.9	13.0
31	16.8		28.3		383.6		45.9	28.6		18.4		13.4
Ave.	17.2	16.0	22.1	33.4	238.5	291.7	83.7	37.6	21.4	17.8	15.9	13.7

Data Source: Salt Lake City Water Department.

Table B-2. Little Cottonwood Creek Site 9 daily streamflow in second-feet, 1975.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.1	13.3	11.8	13.9	20.5	258.9	501.0	136.1	49.2	25.0	22.2	18.0
2	13.0	12.0	12.0	13.6	20.5	310.7	511.5	123.7	49.0	26.9	26.5	17.8
3	12.6	12.1	12.2	13.5	26.4	336.3	535.5	115.5	48.6	27.4	23.3	17.3
4	12.7	12.0	12.1	13.6	26.5	316.7	560.4	111.2	47.7	26.0	23.9	17.1
5	12.8	12.0	12.2	13.4	23.2	338.7	588.2	104.2	47.0	25.2	24.6	17.2
6	13.0	11.8	13.0	13.6	21.3	409.7	610.8	103.2	45.3	24.1	24.3	17.1
7	13.0	11.3	13.4	14.1	21.6	492.6	600.1	112.3	44.0	20.2	24.4	16.7
8	11.8	11.7	13.0	13.7	22.8	515.9	595.7	97.6	44.6	24.4	24.3	16.7
9	12.7	11.7	13.5	13.8	22.7	395.9	564.5	92.1	43.3	25.1	23.4	16.1
10	12.9	12.2	13.1	13.6	37.1	285.7	563.8	83.8	43.2	25.2	23.0	16.4
11	12.7	11.8	13.2	13.6	42.2	252.4	474.3	81.5	44.1	24.9	22.8	16.0
12	13.2	11.8	13.1	13.6	47.5	285.8	435.4	82.5	51.3	26.2	22.1	17.3
13	12.7	12.2	13.1	13.8	47.5	407.6	397.9	76.7	52.3	26.3	23.3	16.6
14	13.0	11.6	10.8	14.4	63.5	333.4	363.8	75.8	45.0	24.6	23.3	16.1
15	12.5	11.8	11.1	14.3	88.5	324.7	383.7	72.2	40.5	19.9	22.8	14.2
16	12.4	12.2	11.0	15.5	117.3	520.6	328.4	69.5	39.2	22.3	23.2	16.9
17	12.3	11.7	12.1	15.2	136.7	469.7	240.2	65.5	38.8	25.3	23.1	15.9
18	12.2	11.3	12.9	15.2	162.2	406.7	224.3	67.7	38.4	25.3	22.2	15.2
19	12.2	11.5	13.6	15.0	197.3	324.6	213.7	61.9	38.8	25.6	21.0	16.0
20	12.2	11.6	12.5	15.8	195.6	242.9	204.4	62.2	35.9	31.4	20.3	16.6
21	12.2	11.2	12.7	16.2	151.9	198.5	204.7	61.2	34.9	23.2	17.4	16.7
22	12.1	10.6	13.7	17.7	123.8	176.0	194.5	60.4	34.8	24.8	17.8	16.0
23	12.4	11.3	12.8	18.2	104.81	239.2	181.4	58.8	30.9	23.6	18.7	15.7
24	12.4	11.4	13.4	16.5	95.6	309.2	176.1	58.0	31.8	23.7	20.3	15.9
25	13.3	11.6	16.1	19.9	92.6	331.0	169.2	56.2	31.9	23.0	18.0	15.8
26	12.5	11.4	15.4	20.0	104.9	294.2	161.0	54.8	32.3	23.6	17.4	15.7
27	12.4	11.6	13.8	20.3	117.2	330.5	151.8	53.2	27.2	24.2	18.3	15.0
28	12.4	11.5	13.0	19.9	116.7	386.1	178.5	51.4	28.3	23.3	18.0	15.1
29	11.7		13.2	20.1	119.9	446.3	185.5	49.8	27.1	22.6	17.4	14.9
30	12.5		14.5	19.8	143.8	455.6	184.8	47.9	26.5	23.0	17.0	14.9
31	14.0		14.1		194.3		168.3	47.9		22.2		14.8
Ave.	12.6	11.7	13.0	15.7	87.3	346.5	350.1	77.2	39.7	24.5	21.5	16.2

Data Source: Salt Lake City Water Department.

Table B-3. Little Cottonwood Creek Site 10 daily streamflow in second-feet, 1974.[a]

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	2.3	2.3	2.3	69.0	359	143	32.0	2.6	1.3	1.7	1.4
2	2.6	2.3	2.3	2.6	81.7	363	136	31.0	2.6	1.7	1.7	1.4
3	2.3	2.0	2.3	2.6	88.3	365	121	29.8	2.6	1.4	1.4	1.4
4	2.0	2.0	2.0	2.3	94.9	363	114.0	27.6	2.6	1.4	1.4	1.4
5	2.3	2.3	2.3	2.3	125.0	357	109.0	26.2	2.6	1.4	1.4	1.7
6	2.0	2.3	2.3	2.3	160	306	107.0	25.5	2.5	1.3	1.4	1.4
7	2.0	2.0	2.3	2.3	188	235	103.0	28.3	2.4	1.2	1.4	1.4
8	2.0	2.0	2.3	2.6	242	188	96.0	30.6	2.4	1.2	1.4	1.4
9	2.0	1.7	2.3	19.6	282	156	94.9	19.0	2.3	1.2	1.4	1.4
10	2.0	1.7	2.3	20.8	329	163	92.7	7.9	2.3	1.2	1.4	1.4
11	2.0	1.7	2.3	20.8	280	211	88.3	6.5	2.3	1.2	1.4	1.4
12	2.0	1.7	2.3	22.0	268	277	87.2	16.6	2.3	1.2	1.4	1.7
13	2.0	1.7	2.6	22.0	240	348	77.3	6.1	2.0	1.2	1.4	1.4
14	2.0	1.7	2.6	21.4	213	386	73.0	3.8	2.0	1.2	1.4	1.4
15	2.3	1.7	2.6	22.0	215	393	73.0	3.7	2.0	1.0	1.4	1.4
16	2.6	1.7	3.7	22.7	221	390	74.0	3.7	2.0	1.0	1.4	1.4
17	3.3	2.0	3.7	22.7	229	375	73.0	3.7	2.0	1.0	1.4	1.4
18	3.3	2.0	2.9	25.5	224	353	70.0	4.5	2.0	0.9	1.7	1.4
19	3.3	2.0	2.6	26.9	196	335	67.0	4.1	1.8	0.9	1.7	1.4
20	2.9	2.0	2.6	31.4	166	308	65.0	3.7	1.8	1.0	1.7	1.7
21	2.9	2.0	2.6	29.8	142	267	62.0	3.7	1.7	2.0	1.4	1.4
22	2.6	2.0	2.6	30.6	128	243	58.0	3.3	1.7	1.4	2.0	1.4
23	2.6	2.0	2.3	34.6	128	232	54.0	3.3	1.7	1.5	2.0	1.4
24	2.6	1.7	2.3	45.0	156	234	45.9	2.9	1.7	2.3	1.7	1.4
25	2.6	2.0	2.3	59.0	227	234	43.4	2.9	1.7	1.4	1.4	1.4
26	2.6	2.0	2.3	72.0	317	216	40.2	2.9	0.8	1.4	1.4	1.4
27	2.3	2.0	2.3	68.0	412	192	38.6	2.9	1.7	1.4	1.4	1.4
28	2.3	2.0	2.3	64.0	454	169	37.0	2.8	1.4	1.4	1.4	1.4
29	2.3		2.3	61.0	431	160	35.6	2.7	1.4	1.5	1.4	1.4
30	2.3		2.3	61.0	388	152	33.8	2.7	1.4	1.4	1.4	1.4
31	2.3		2.3		367		33.0	2.6		1.7		1.2
Ave.	2.4	1.9	2.5	27.4	227.8	277.7	75.7	11.2	2.0	1.3	1.5	1.4

Data Source: Salt Lake City Water Department.

[a]The main diversion to the Little Cottonwood Water Treatment Plant is located approximately at Site 9 and was closed April 9 - July 24, 1974. It was reopened fully on August 10, 1974. During this period a secondary intake located downstream from the Parshall flume was utilized to supply the treatment plant. This accounts for higher than usual discharges recorded at Site 10 during these months.

Table B-4. Little Cottonwood Creek Site 10 daily streamflow in second-feet, 1975.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	2.3	1.2	1.4	2.0	218	452	90.5	12.4	6.9	2.3	2.0
2	1.2	1.4	1.2	1.4	2.0	270	462	78.4	12.4	5.3	2.3	1.9
3	1.2	1.3	1.2	1.5	1.9	296	487	72.0	12.2	3.3	2.3	1.8
4	1.2	1.2	1.2	1.4	2.0	272	510	65.0	11.2	3.3	2.3	1.7
5	1.2	1.2	1.2	1.4	2.3	294	537	63.0	10.6	2.9	2.6	1.7
6	1.2	1.2	1.2	1.5	2.3	363	559	62.0	9.0	2.9	2.3	1.7
7	1.2	1.2	1.4	1.7	2.6	447	548	61.0	7.7	11.2	2.3	1.7
8	1.2	1.3	1.3	1.7	2.7	470	544	56.0	7.3	17.2	2.3	1.7
9	1.2	1.3	1.4	1.7	2.6	350	513	51.3	6.9	7.3	2.3	1.6
10	1.2	1.3	1.4	1.5	2.6	237	513	44.2	6.9	7.3	2.0	1.5
11	1.2	1.3	1.4	1.7	7.7	204	423	41.8	7.7	7.3	2.1	1.5
12	1.2	1.4	1.4	1.7	13.0	237	384	42.6	14.8	8.1	2.1	1.7
13	1.2	1.4	1.4	1.7	13.0	355	380	38.6	16.0	8.5	2.3	1.8
14	1.2	1.4	1.4	1.7	29.0	284	346	35.4	9.0	7.3	2.0	1.7
15	1.2	1.7	1.4	1.6	54.0	311	333	32.2	4.5	3.3	2.0	1.7
16	1.2	1.7	1.4	1.8	82.8	487	278	30.0	4.1	4.1	2.0	1.7
17	1.2	1.4	1.4	2.0	97.2	419	190	27.6	4.1	2.9	2.0	1.7
18	1.2	1.2	1.4	2.0	123	359	175	26.2	4.1	2.9	2.0	1.7
19	1.2	1.2	1.4	2.0	157	277	164	24.8	4.1	2.9	2.0	1.5
20	1.2	1.4	1.2	2.0	156	196	154	24.3	3.7	2.6	1.8	1.5
21	1.2	1.2	1.5	2.0	113.0	152	156	23.4	3.7	3.7	1.8	1.4
22	1.2	1.2	1.4	2.0	81.7	138	146	22.7	4.1	2.9	1.8	1.4
23	1.4	1.0	1.4	2.0	63.0	192	134	21.0	4.1	2.9	1.8	1.4
24	1.4	1.0	1.4	2.0	54.0	262	128	20.2	3.7	2.9	1.8	1.4
25	1.4	1.0	1.7	2.0	51.3	284	123	18.6	3.7	2.6	1.7	1.4
26	1.4	1.0	2.3	2.1	62.0	247	114	17.2	3.7	2.6	1.7	1.4
27	1.4	1.2	2.0	2.2	74.0	284	104	15.4	8.1	3.3	1.7	1.4
28	1.4	1.2	1.4	2.1	73.0	346	130	13.6	7.7	2.6	1.8	1.4
29	2.0		1.4	2.1	77.3	395	137	12.4	7.3	2.3	2.0	1.4
30	2.3		1.4	2.0	103.0	401	136	11.8	6.9	2.4	2.0	1.4
31	2.6		1.4		153		120	11.8		2.3		1.4
Ave.	1.3	1.3	1.4	1.8	53.6	301.6	302.6	37.3	7.4	4.8	2.0	1.6

Data Source: Salt Lake City Water Department.

Appendix C

Streamflow Measurements and Computations

for Sites 1B-7

1974-1975

The distribution graphs of Little Cottonwood Creek discharge which were presented in Figure 5 and the daily streamflow data in Appendix B indicate that flow rates in the creek peak during the snowmelt season and then begin a decline which continues until the minimum levels are reached in midwinter. Once most of the surface runoff from melting snow has occurred, the decline becomes steady and quite gradual so that streamflows change little from day to day. The continuing slow decline reflects reductions in groundwater contributions and soil drainage as the water table drops slowly from its spring maximum. The only other sources which could affect the flow rates are precipitation and discharges from the reservoirs of White Pine, Red Pine, and Secret Lakes.

Red Pine Lake contains 280 acre-feet of water and discharges this storage at a rate of 6 cfs. White Pine Lake has a capacity of 312 acre-feet with a release rate of 7 cfs when its gate is opened (Van Valkenburg 1976). The gates of both reservoirs are opened on the same day. The date is determined by downstream needs and usually falls in the latter part of August.

The precipitation data in Appendix A show that no measurable rain fell in the canyon between August 8 and September 12, 1974. However, streamflow at Site 9 increased on August 18. This must have been caused by the initial discharge from the reservoirs. Once September precipitation has been assigned to corresponding fluctuations in streamflow, a drop of 9 cfs in the flow rate at Site 9 on September 16 must signify the exhaustion of the reservoir storage.

An approximation of what the natural flow rates would have been during the period August 17 - September 16 without reservoir releases was constructed by interpolation of the measured flows and rates of changes in flow on those dates. The differences between the actual streamflows and the estimated natural flows indicate that the reservoirs contributed between 7 and 13 cfs during this period. At their average contribution of 9 cfs during the 29 days that they discharged, about 88 percent of the total storage capacity of the reservoirs apparently reached Site 9. The remainder was presumably distributed among evaporation, seepage, and channel storage.

Secret Lake contains 60 acre-feet of water and discharges at a rate of 3 cfs when its gate is opened near the end of September (Van Valkenburg 1976). The comparatively small flow makes the effect of Secret Lake more difficult to detect. However, the increases in the flow of Little Cottonwood Creek on October 1-2, 1974, may have been associated with the beginning of the discharge from the lake. Secret Lake apparently supplied only about 2 cfs of the total streamflow at Site 9, so it did not have much impact on trends in the flow of Little Cottonwood Creek.

Similar comparisons of precipitation and flow data for 1975 identify the first day of discharge from Red Pine and White Pine Lakes as September 1. Discharge ceased on September 27. The discharge period was later than in 1974 because the late runoff of 1975 and the prolonged high flow of the creek delayed the need to supply additional water. The flow increase resulting from the opening of Secret Lake apparently

reached Site 9 on October 2, 1975, which was too late to affect any sampling operations.

Table C-1 contains the results of flow measurements made within the canyon during 1975. The table also contains the streamflows at Site 9 which were reported by the Salt Lake City Water Department for the same days. Discharges measured by Glenne et al. (1973) during 1972-73 at several of the sites are shown in Table C-2.

The natural streamflow at Site 9 is augmented by the controlled release of water from the reservoirs, but none of the upper sites were affected by these controlled releases during the periods in which the flows at those sites were being gaged. The estimated flow of 9 cfs which was contributed by the discharges from Red Pine and White Pine Lakes was subtracted from the reported flows at Site 9 for the period September 1 - September 6, 1975. Ratios of the measured streamflows at the upper sites to the remaining natural flows at Site 9 were then calculated and are shown as percentages in Table C-3.

A similar approach was taken with the other available flow data for sites within the canyon, that of Glenne et al. (1973). Table C-4 shows that the proportion of the streamflow at Site 9 which was measured at a given upstream site did not vary greatly throughout most of the year. The only obvious seasonal variation was a decline in the relative flows at upper sites during the early stages of snowmelt, as was indicated by the results for April 29, 1973. According to Figure 5, this date fell during the early portion of spring runoff when only the lower part of the canyon would have been expected to be supplying runoff water to the creek. The results in Table C-4 suggest that an average ratio of

Table C-1. Little Cottonwood Creek streamflow in cfs.

Date	Site							
	1B	1	2	3	4	5	7	9[a]
7/31/75		29.60	74.96	74.71	63.82	76.22	137.08	168.3
8/ 2 /75		17.76			95.74		81.44	123.7
8/ 9 /75		20.48						92.1
8/11/75		14.07	45.83	34.67				81.5
8/20/75	2.37	13.24			18.62	27.15		62.2
8/21/75	2.60	16.96			27.40	26.66		61.2
8/22/75	2.14	11.56			38.08	31.18		60.4
8/23/75	1.70	10.75			27.40	25.39		58.8
8/24/75	2.83	7.37			33.49	29.83		58.0
8/25/75	2.14	6.97			20.73	23.86		56.2
8/26/75	1.31	4.91			22.11	35.09		54.8
8/27/75	1.49	6.46			18.95	21.60		53.2
8/30/75	1.78	6.60			13.56	20.91		47.9
8/31/75	2.60	6.86			23.37	17.05		47.9
9/ 1 /75	0.81	6.45			17.69	22.63		49.2
9/ 2 /75	1.01	6.60			19.48			49.0
9/ 3 /75	1.30	4.93			13.96	21.60		48.6
9/ 4 /75	0.55	4.70			17.81	16.67		47.7
9/ 5 /75	0.62	5.29			12.30	14.92		47.0
9/ 6 /75	1.30	6.45			20.73	17.74		45.3
11/ 9 /75					14.90			23.4

[a]Data Source: Salt Lake City Water Department.

Table C-2. Little Cottonwood Creek streamflow in cfs.

Date	Site							
	1B	1	2	3	4	5	7	9
10/10/72		4.31	6.25		14.0			34.6
11/14/72		1.75	2.91		10.17			21.5
12/22/72		1.70	2.77		7.55			17.8
1/16/73		1.60	2.68		7.60			15.2
2/20/73		1.60	2.70		7.62			14.3
3/28/73		1.53	2.26		11.62			14.6
4/29/73		2.06	7.61		17.6			58.6
5/17/73		29.9	55.0		106			329
6/ 1 /73		31.6	41.2		80.4			279
7/20/73		9.64	17.3		35.5			81.0

Data Source: Glenne, Hadley, Borg, and Eckhoff (1973).

Table C-3. Little Cottonwood Creek streamflow as a percentage of discharge at Site 9.

Date	Site						
	1B	1	2	3	4	5	7
7/31/75		17.6	44.5	44.4	37.9	45.3	81.5
8/ 2 /75		14.4			77.4		65.8
8/ 9 /75		22.2					
8/11/75		17.3	56.2	42.5			
8/20/75	3.81	21.3			29.9	43.7	
8/21/75	4.25	27.7			44.8	43.6	
8/22/75	3.54	19.1			63.1	51.6	
8/23/75	2.89	18.3			46.6	43.2	
8/24/75	4.88	12.7			57.7	51.4	
8/25/75	3.81	12.4			36.9	42.5	
8/26/75	2.39	9.0			40.4	64.0	
8/27/75	2.80	12.1			35.6	40.6	
8/30/75	3.72	13.8			28.3	43.7	
8/31/75	5.43	14.3			48.8	35.6	
9/ 1 /75	2.01	16.0			44.0	56.3	
9/ 2 /75	2.53	16.5			48.7		
9/ 3 /75	3.28	12.5			35.3	54.6	
9/ 4 /75	1.42	12.1			46.0	43.1	
9/ 5 /75	1.63	13.9			32.4	39.3	
9/ 6 /75	3.58	17.8			57.1	48.9	
11/ 9 /75					63.7		

streamflow at a given site to that at the canyon mouth might apply throughout almost the entire year without creating major errors.

The average discharge ratios which were obtained at the various sites during the period July - September 1975 were quite similar to those of 1972-73 except for two relatively high measurements at Site 2 in the former period. Comparison of the measured streamflows at Sites 2 through 4 suggests that the Site 2 results may have been in error during this period because the results do not show increases in downstream flow rates even though tributary inflows do enter the creek between Sites 2 and 3. Accordingly, a new ratio for Site 2 was derived by assuming that the same relative flow increase between Sites 1 and 2 which was shown by the data of Glenne et al. (1973) would also apply to our data. The ratios which are the averages of the 1975 measurements are given in Table C-5 along with the average results obtained by Glenne et al. (1973).

Temporary or localized perturbations could have affected the relationships between flow volumes at various points in the canyon. One example of these was the series of unusually high streamflow measurements which were obtained at Site 1 during August 20-23, 1975. This event was undoubtedly associated with the locally heavier precipitation which was recorded at Alta during that period. However, the use of the general relationships in Table C-5 is considered to be valid inasmuch as they were applied only to monthly average streamflows and the use of the monthly averages would tend to cancel out the effects of most transitory or local variations.

Longer term fluctuations are likely to have more noticeable effects on the relationships between streamflows at different sites. Early

Table C-4. Little Cottonwood Creek streamflow as a percentage of discharge at Site 9.

Date	Site						
	1B	1	2	3	4	5	7
10/10/72		12.5	18.1		40.5		
11/14/72		8.1	13.5		47.4		
12/22/72		9.6	15.6		42.4		
1/16/73		10.5	17.6		50.0		
2/20/73		11.2	18.9		53.3		
3/28/73		10.5	15.5		79.5		
4/29/73		3.5	13.0		30.0		
5/17/73		9.1	16.7		32.2		
6/ 1 /73		11.3	14.8		28.8		
7/20/73		11.9	21.4		43.8		

Data Source: Glenne, Hadley, Borg, and Eckhoff (1973).

Table C-5. Average ratios of streamflow at upper sites to flow at Site 9.

Period	Site						
	1B	1	2	3	4	5	7
1972-73[a]		0.098	0.165		0.448		
1974-75	0.0325	0.157	0.25	0.43	0.45	0.47	0.74
			0.016 During Jan.-Apr. 1975	0.33 During Jan.-Nov. 1974			

[a]Data Source: Glenne, Hadley, Borg, and Eckhoff (1973).

Table C-6. Little Cottonwood Creek monthly average streamflow in second-feet (1974-1975).

Month	Site								
	1B	1	2	3	4	5	7	9[a]	10[a]
Jan. 1974		2.7	4.3	5.7	7.7	8.1	12.7	17.2	2.4
Feb. 1974		2.5	4.0	5.3	7.2	7.5	11.8	16.0	1.9
Mar. 1974		3.5	5.5	7.3	9.9	10.4	16.4	22.1	2.5
Apr. 1974		5.2	8.4	11.0	15.0	15.7	24.7	33.4	27.4
May 1974		37.4	59.6	78.7	107	112	176	239	228
June 1974		45.8	72.9	96.3	131	137	216	292	278
July 1974		13.1	20.9	27.6	37.7	39.3	61.9	83.7	75.7
Aug. 1974	1.1	5.3	8.4	11.1	15.1	15.7	26.3	37.6	11.2
Sept. 1974	0.55	2.7	4.2	5.6	7.6	7.9	14.1	21.4	2.0
Oct. 1974	0.58	2.8	4.5	5.9	8.0	8.4	13.2	17.8	1.3
Nov. 1974		2.5	4.0	5.2	7.2	7.5	11.8	15.9	1.5
Dec. 1974		2.2	3.4	5.9	6.2	6.4	10.1	13.7	1.4
Jan. 1975			0.20	5.4	5.7	5.9	9.3	12.6	1.3
Feb. 1975			0.19	5.0	5.3	5.5	8.7	11.7	1.3
Mar. 1975			0.21	5.6	5.9	6.1	9.6	13.0	1.4
Apr. 1975			0.25	6.8	7.1	7.4	11.6	15.7	1.8
May 1975			21.8	37.6	39.3	41.0	84.6	87.3	53.6
June 1975		54.4	86.6	149	156	163	256	347	302
July 1975		55.0	87.5	151	158	165	259	350	303
Aug. 1975	2.5	12.1	19.3	33.2	35.0	36.3	57.1	77.2	37.3
Sept. 1975	1.0	5.0	7.9	13.6	14.2	14.9	26.3	39.7	7.4

[a]Data Source: Salt Lake City Water Department.

season snowmelt will cause increases in the discharges at the lower sites before it affects the higher altitudes. However, the available data, including temperature, snow depth, and discharge, as well as personal observations indicate that during the springs of 1974 and 1975 such differences in the timing of snowmelt did not markedly alter the relative flows at the sites in question. Except near the mouth of the canyon, the amount of runoff was insignificant before late April 1974, and after that the upper boundary of the snowmelt zone moved rapidly up the canyon and reached Site 1 by early May. Thus the average April situation was one of essentially no runoff within the canyon, and the flows at the upper sites would have maintained a constant relationship although it is possible that they could have all been somewhat less than estimated. In May, all areas of the canyon were producing runoff, and the relationships should also have been fairly stable. There was some indication from the data of Glenne et al. (1973), however, that during the runoff season the relative flow at Site 4 was about 10 percent lower than at other times. In 1975, early runoff may have affected Sites 5 and 7 during the middle of May, but runoff did not occur at any of the higher sites until the beginning of June.

Another factor which might alter the relationships among sites is the discharge of the Wasatch Drain Tunnel. The flow from the tunnel enters Little Cottonwood Creek near Site 3 at a rate of about 8 cfs in winter and 12-14 cfs in midsummer (Van Valkenburg 1976). Our measurements at Site 3 indicated that the flow which was present in the creek bed above the discharge point of the tunnel comprised 33 percent of the total streamflow at site 9. Accordingly, this ratio was used at Site 3 for the period of January through November, 1974, when the sample

site was located above the tunnel discharge. The figure of 43 percent, which was derived from the measurements made during the summer of 1975, was used for the period after Site 3 had been moved below the discharge point of the tunnel. A flow of 8 cfs from the tunnel would have supplied about half of the total creek flow at Site 9 during midwinter months. This indicates that the streamflow ratios for sites below the tunnel discharge should be higher during the midwinter periods than at other times of year. However, the limited amount of data available did not justify any changes in the ratios which were used during these months.

During the winter of 1975, the flows at Sites 1 and 2 were greatly diminished from those which had been observed during the previous winter. Site 1 could not be sampled, and the flow which was present at Site 2 appeared to consist mainly of mine drainage which enters Little Cottonwood Creek at the sample site. Accordingly, for the period of January through April 1975 the ratio of the flow at Site 2 to that at Site 9 was reduced to 1.6 percent, a figure which reflects the measured discharge from the mine.

The study by Glenne et al. (1973) was conducted during a year in which the pattern of runoff distribution closely resembled those which were observed during 1974 and 1975 (Figure 5). Their results indicated that the ratios of flow at upstream sites to the streamflow at Site 9 did not vary greatly enough throughout the year to change the basic relationships between sites. Accordingly, the average ratio for each site which was obtained during the summer of 1975 and is shown in Table C-5 was applied to the entire period of this project, with the exception of the variations at Sites 2 and 3 which have been discussed.

The use of the average ratios should have tended to reduce some of the errors which were inherent in the original stream measurements. Addison (1946) stated that an error of $\pm$ 8 - 10 percent could be expected when surface floats were used to determine stream velocity. This problem, together with our assumption that the float velocity was equal to the average stream velocity, may account for some of the differences between the ratios which were obtained in 1975 and those of Glenne et al. (1973). The existence of these discrepancies, as well as the unknown amount of difference between the measured and actual streamflows, should not reduce the usefulness of comparisons between mass flow rates which are based on the 1975 flow ratios because of the consistent manner in which the 1975 measurements were made.

Once the flow ratios had been established, they were used along with the monthly average streamflows at Site 9 to calculate monthly average discharges at each site. The actual discharges at Sites 9 and 10 were known and are shown in Table C-6. During August - September 1974 and September 1975, the reported flows at Site 9 were modified for these calculations by subtraction of a daily average flow equal to that amount of controlled discharge from Red Pine and White Pine Lakes which occurred during the month. The latter figure was based on the assumption of an average flow of 9 cfs from the reservoirs during the days on which the reservoir gates were open. White Pine Fork enters Little Cottonwood Creek above Site 7. Because of this, only one-half the reduction in streamflow at Site 9 which was used for the other sites was employed for the calculation of flows at Site 7 during these months. The resulting monthly average streamflows at each site are shown in Table C-6 and were used in the derivation of the mass loadings.

Appendix D

Analytical Methods

Table D-1. Physical and chemical analyses.

Parameter	Method	Reference
Alkalinity	Potentiometric Titration	1
Biochemical Oxygen Demand	Dissolved Oxygen: Winkler with Azide Modification	1
Calcium	EDTA Titrimetric	1
Chloride	Mercuric Nitrate	1
Hardness	EDTA Titrimetric	1
Total Iron	Bathophenanthroline	2
Ammonia Nitrogen	Indophenol	3
Nitrate Nitrogen	Cadmium Reduction	2
Nitrite Nitrogen	Diazotization	2
pH Value	Electrometric	1
Orthophosphate, (Dissolved)	Ascorbic Acid	2
Total (Dissolved) Phosphorus	Persulfate Digestion	1, 4
Potassium	Flame Photometric with Direct-intensity Measurement	1
Sodium	Flame Photometric with Direct-intensity Measurement	1
Total Solids	Gravimetric, (103°C)	1, 4
Total Dissolved Solids	Gravimetric, (180°C) 0.45 micron Membrane Filter	1, 4
Suspended Solids	Gravimetric, (103°C) Glass Fiber Filter	1
Specific Conductance	Conductometric	1
Sulfate	Turbidimetric	1
Temperature	Mercury Thermometer	1

Table D-1. Continued.

1. APHA, Standard Methods for the Examination of Water and Wastewater, 13th edition, 1971.

2. Strickland and Parsons, A Practical Handbook of Seawater Analysis, 1968.

3. Solórzano, Limnology and Oceanography 14, 1969.

4. U.S. EPA, Methods for Chemical Analysis of Water and Wastes, 1971.

Table D-2. Bacteriological analyses.

Parameter	Method	Media	Reference
Total Coliform	Membrane Filter		
	One-stage	M-Endo MF Broth	1, 2
	Two-stage	Lauryl Sulfate Tryptose Broth LES Endo Agar	1, 2
	Multiple Tube Fermentation		
	Presumptive Test	Lauryl Sulfate Tryptose Broth	1
	Confirmed Test	Brilliant Green Lactose Bile Broth	1
Fecal Coliform	Membrane Filter		
	One-stage	M-FC Broth	1, 2
	Two-stage	M-FC Agar Lactose Agar	3
	Multiple Tube Fermentation		
	Confirmed Test	EC Medium	1
Fecal Streptococcus	Membrane Filter		
	One-stage	M-Enterococcus Agar	1, 2
	Two-stage	PYC Enrichment Broth M-Enterococcus Agar	2, 4

1. APHA, Standard Methods for the Examination of Water and Wastewater, 13th edition, 1971.
2. Millipore Corp., Biological Analysis of Water and Wastewater, AM302, 1973.
3. Rose, Geldreich, and Litsky, Applied Microbiology 29, 1975.
4. Rose and Litsky, Applied Microbiology 13, 1965.

Appendix E

Traffic Data State Highway 210

Little Cottonwood Canyon

1970-1975

Data Source: Utah Department of Transportation
Planning Statistics Section

Table. E-1. 1970 automatic traffic recorder data.

Month	Average Daily Number of Vehicles									% the Month Daily Average Is of the Yr. Daily Ave.
	Day of the Week							Average Day Sun. Thru Saturday	Average Weekday Mon. Thru Friday	
	SUN	MON	TUE	WED	THU	FRI	SAT			
January	1869	777	1059	646	1211	1220	1743	1218	983	105.0
February	2357	1080	1138	1035	1171	1238	2241	1466	1132	126.4
March	1907	1084	1205	1324	1405	1776	2250	1564	1359	134.8
April	1871	767	533	831	894	1097	1933	1132	824	97.6
May	1208	270	260	249	343	655	1067	579	355	49.9
June	1749	651	629	711	646	824	1013	889	692	76.6
July	1783	751	777	769	893	1149	1477	1086	868	93.6
August	1733	801	830	862	899	993	1211	1047	877	90.3
September	1582	919	715	785	781	845	975	943	809	81.3
October	1909	709	800	729	750	770	1102	967	752	83.4
November	1818	732	894	853	1338	1519	2518	1382	1067	119.1
December	1600	1915	1608	1662	1622	959	2154	1646	1553	141.9
Daily Average For Year	1782	871	871	871	996	1087	1640	1160	939	
% Daily Ave. of Year Daily Ave.	153.6	75.1	75.1	75.1	85.9	93.7	141.4			

Table E-2. 1971 automatic traffic recorder data.

Month	Average Daily Number of Vehicles									% the Month Daily Average Is of the Yr. Daily Ave.
	Day of the Week							Average Day Sun. Thru Saturday	Average Weekday Mon. Thru Friday	
	SUN	MON	TUE	WED	THU	FRI	SAT			
January	1799	658	1214	795	895	1317	2065	1249	976	89.7
February	2684	1429	1610	1141	1215	1115	2144	1620	1302	116.3
March	2088	846	1291	869	1029	1260	1969	1336	1059	95.9
April	2142	1035	1110	1094	1267	1373	1766	1398	1176	100.4
May	1302	695	605	654	572	628	1211	810	631	58.1
June	1561	1045	1058	1059	1064	1128	1248	1166	1071	83.7
July	1665	1192	1125	1139	1110	1221	1451	1272	1157	91.3
August	1553	1085	1119	1117	1220	1356	1225	1239	1179	88.9
September	1715	1322	1089	1090	1234	1353	1772	1368	1218	98.2
October	1315	1059	1149	975	1086	1065	1231	1126	1067	80.8
November	2737	1229	1485	1506	1782	2366	3234	2048	1674	147.0
December	1806	2011	2012	2175	2202	2373	1955	2076	2155	149.0
Daily Average For Year	1864	1134	1239	1135	1223	1380	1773	1393	1222	
% Daily Ave. of Year Daily Ave.	133.8	81.4	88.9	81.5	87.8	99.1	127.3			

Table E-3. 1972 automatic traffic recorder data.

Month	Average Daily Number of Vehicles									% the Month Daily Average Is of the Yr. Daily Ave.
	Day of the Week							Average Day Sun. Thru Saturday	Average Weekday Mon. Thru Friday	
	SUN	MON	TUE	WED	THU	FRI	SAT			
January	4269	1548	2116	1423	1582	2428	4241	2515	1819	112.6
February	5032	2682	2004	1952	2193	2613	4546	3003	2289	134.5
March	4537	2354	2710	2473	2562	2981	3801	3060	2616	137.0
April	3429	1289	1158	1235	1417	2012	3294	1976	1422	88.5
May	1540	913	723	679	659	736	876	875	742	39.2
June	2119	1097	1054	1242	1149	1346	1530	1362	1178	61.0
July	2985	1793	1888	1522	1643	1783	2149	1966	1726	88.0
August	3271	1532	1724	1812	1861	2129	2536	2124	1812	95.1
September	3785	2035	1434	1558	1669	2018	2513	2145	1743	96.1
October	2743	1424	1448	1365	1334	1467	1836	1660	1408	74.3
November	3214	1608	2057	1996	2818	3152	3872	2674	2326	119.7
December	4338	2819	3233	3178	3249	2562	4667	3435	3008	153.8
Daily Average For Year	3439	1758	1796	1703	1845	2102	2988	2233	1841	
% Daily Ave. of Year Daily Ave.	154.0	78.7	80.4	76.3	82.6	94.1	133.8			

Table E-4. 1973 automatic traffic recorder data.

Month	Average Daily Number of Vehicles									% the Month Daily Average Is of the Yr. Daily Ave.
	Day of the Week							Average Day Sun. Thru Saturday	Average Weekday Mon. Thru Friday	
	SUN	MON	TUE	WED	THU	FRI	SAT			
January	5099	3575	2878	2350	3162	2587	5077	3533	2910	137.7
February	4613	3333	3174	2920	3247	3453	5144	3698	3225	144.2
March	4339	2872	2814	2439	3306	3658	5234	3523	3018	137.3
April	3816	2075	2209	2814	2659	2637	3235	2778	2479	108.3
May	2143	1300	1099	1254	1217	1395	1602	1430	1253	55.8
June	2465	1460	1608	1680	1627	1702	2028	1796	1615	70.0
July	2878	1678	2122	2174	1699	1944	2414	2130	1923	83.0
August	3354	1783	1924	2123	2013	2113	2637	2278	1991	88.8
September	3029	1971	1581	1790	1822	2092	2212	2071	1851	80.7
October	3212	1592	1552	1547	1628	1866	2408	1972	1637	76.9
November	3023	1558	2235	2385	3133	3742	3040	2731	2611	106.5
December	3128	2440	2217	3574	2497	2510	3487	2836	2648	110.6
Daily Average For Year	3425	2136	2118	2254	2334	2475	3210	2565	2263	
% Daily Ave. of Year Daily Ave.	133.5	83.3	82.6	87.9	91.0	96.5	125.1			

Table E-5. 1974 automatic traffic recorder data.

Month	Average Daily Number of Vehicles									% the Month Daily Average Is of the Yr. Daily Ave.
	Day of the Week							Average Day Sun. Thru Saturday	Average Weekday Mon. Thru Friday	
	SUN	MON	TUE	WED	THU	FRI	SAT			
January	4294	1884	2801	2783	2808	3356	3788	3102	2726	122.7
February	5440	3642	2069	2510	3395	2837	5201	3585	2891	141.8
March	3970	2572	3048	3053	3069	2914	3813	3206	2931	126.8
April	4196	2112	1586	1722	2100	1932	2118	2252	1890	89.0
May	1628	1142	964	987	973	1182	1392	1181	1050	46.7
June	2895	1441	1599	1569	1618	1901	2148	1882	1626	74.4
July	3908	1635	1799	2301	2245	2115	2823	2404	2019	95.1
August	3971	1807	1958	1987	2067	2311	2838	2420	2026	95.7
September	4133	2126	1774	1775	1797	2158	2720	2355	1926	93.1
October	3248	1488	1468	1513	1591	1802	2321	1919	1572	75.9
November	3286	1535	1871	1884	2355	2359	3350	2377	2001	94.0
December	4632	3818	3667	2958	3737	3559	3329	3671	3548	145.2
Daily Average For Year	3800	2100	2050	2087	2313	2369	2987	2529	2184	
% Daily Ave. of Year Daily Ave.	150.3	83.0	81.1	82.5	91.5	93.7	118.1			

Table E-6. 1975 automatic traffic recorder data.

Month	Average Daily Number of Vehicles									% the Month Daily Average Is of the Yr. Daily Ave.
	Day of the Week							Average Day Sun. Thru Saturday	Average Weekday Mon. Thru Friday	
	SUN	MON	TUE	WED	THU	FRI	SAT			
January	6287	2865	3080	4066	3526	3730	4755	4044	3453	142.8
February	5301	3810	3496	4258	3686	3763	5807	4303	3803	151.9
March	3190	2104	3132	3476	3609	4587	4893	3570	3382	126.1
April	4851	1507	1916	2187	2821	3072	5763	3160	2301	111.6
May	1218	926	631	677	843	1007	1340	949	817	33.5
June	3185	1407	1270	1450	1618	1805	2388	1875	1510	66.2
July	4263	1936	2067	2097	2643	2655	2934	2656	2280	93.8
August	4859	1841	1974	1805	1972	2441	3241	2590	2007	91.5
September	4052	1992	1709	1627	1726	2228	3026	2337	1856	82.5
October	3740	1370	1367	1458	1449	1762	2810	1994	1481	70.4
November	3314	1328	1653	1832	2267	2567	2906	2267	1929	80.0
December	5841	3864	3600	3920	3439	4228	4767	4237	3810	149.6
Daily Average For Year	4175	2079	2158	2404	2467	2820	3719	2832	2386	
% Daily Ave. of Year Daily Ave.	147.4	73.4	76.2	84.9	87.1	99.6	131.3			

Table E-7. Distribution of vehicle types by percentages.

Vehicle	Year					
	1970	1971	1972	1973	1974	1975
Utah Passenger Cars	64.3	55.0	61.6	58.1	59.8	63.4
Out-of-State Passenger Cars	14.8	28.0	22.2	20.3	21.3	19.2
Heavy Commercial	4.5	2.7	2.7	3.5	3.8	2.8
Other Commercial	16.4	14.3	13.5	18.1	15.1	14.6

Appendix F

Results of Regular Sample Runs

Table F-1. Sodium concentrations in mg/l.

Date	Site											
	1B	1	2	3	3A	4	5	6	7	8	9	10
11/23/74			4.10	7.13		6.26	6.26		6.05	3.13	7.45	9.72
12/ 1/74		2.16	4.10				5.83		5.72	2.27	8.10	9.07
12/27/74			5.30	5.07	6.80	5.76					7.95	16.77
12/29/74			6.04	6.62	8.71	6.85					17.18	21.48
1/18/75			5.99	4.73	7.72	5.76					8.07	18.87
1/25/75			30.49	4.75	8.09	6.15	8.63	4.21	7.88	3.56	8.20	16.82
2/ 2/75			7.88	3.99	6.80	5.83	6.48				8.85	14.72
2/ 8/75			6.12	5.80	7.98	6.78	7.11				8.31	22.38
2/15/75			7.87	3.61		5.80			6.89		7.65	19.18
2/22/75			7.65	4.37	6.67	5.90	7.33				7.76	21.31
3/ 1/75			45.70	5.12	19.13	6.71	15.94				9.56	20.19
3/ 8/75			73.35	5.37	27.51	7.73	8.38	7.30	8.16	6.55	21.39	19.36
3/15/75			99.84	5.69	24.45	7.20	19.36				19.36	20.38
3/29/75			23.18	7.15	17.91	8.64					21.07	18.96
4/ 5/75			17.91	5.30	18.96	9.10	9.45	6.91	13.70	5.07	16.86	18.96
4/12/75			96.79	11.70	22.34	17.02	20.21				18.08	18.08
4/19/75			53.18	9.57	25.53	13.83	13.83				21.27	18.08
4/26/75			90.89	9.74	36.79	20.56	17.31				19.48	14.07
5/ 3/75			33.54	15.15	31.38	19.48	18.39	16.23	5.41	19.48	15.15	15.15
5/10/75			39.30	21.72	24.82	20.68	27.92				19.65	14.48
5/17/75			18.61		36.19	25.85	19.65				13.44	14.48
5/24/75			5.34	12.82	21.37	14.96	20.30	16.02			16.02	14.96
5/31/75			5.34	11.75	26.71	11.75	17.09	4.27	13.89		11.75	11.75
6/10/75			1.04		13.55	1.04	4.17		4.17		3.13	3.13
6/14/75					11.46							
6/21/75			3.19	4.25	13.81	5.31	6.38		6.38		6.38	7.44
6/28/75		1.93	1.93	3.86		1.93	3.86		3.86		4.83	3.86
7/ 5/75			3.86	2.90		2.90	2.90				3.86	3.86
7/12/75		2.91	2.91	3.88		3.88	3.88		4.85		4.85	4.85
7/19/75		2.91	2.91	2.91		3.88	4.85		4.85		4.85	4.85
8/ 9/75		19.77	3.25	3.61	6.99	3.97	4.82		4.70		5.06	5.90
11/ 9/75	1.70	2.04	4.77		8.29	5.90	8.40		1.93	3.52	9.99	22.36

Table F-2. Potassium concentrations in mg/l.

Date	Site											
	1B	1	2	3	3A	4	5	6	7	8	9	10
11/23/74			0.45	0.56		0.89	0.78		0.89	0.33	1.34	2.45
12/ 1/74		0.89	1.34				1.90		1.45	0.67	1.56	3.35
12/27/74			1.14	1.02	1.59	1.14					1.59	2.73
12/29/74			1.03	1.26	1.61	0.92					2.07	1.26
1/18/75			0.68	0.68	1.25	0.80					1.14	2.96
1/25/75			0.84	0.74	1.37	0.95	0.95	0.42	0.95	0.21	1.47	2.42
2/ 2/75			0.74	0.84	1.37	0.84	0.95				1.58	2.21
2/ 8/75			0.76	0.98	1.53	1.09	0.98				1.74	2.73
2/15/75			1.09	1.09		1.31			1.09		1.42	2.40
2/22/75			0.87	0.87	1.31	0.98	0.87				1.09	2.29
3/ 1/75			1.06	1.06	1.48	1.27	2.75				1.90	2.75
3/ 8/75			0.66	0.66	1.20	0.88	0.98	0.88	1.31	0.44	1.64	2.63
3/15/75			1.53	0.66	1.20	0.77	0.77				1.42	2.30
3/29/75			1.25	1.25	1.50	1.50					1.99	2.74
4/ 5/75			1.76	1.35	1.76	1.62	1.49	1.49	2.97	1.08	2.16	3.24
4/12/75			8.92	3.24	1.49	2.03	1.08				1.35	2.16
4/19/75			0.81	0.68	1.22	0.95	1.08				1.49	2.16
4/26/75			1.03	0.59	0.88	0.44	0.88				1.03	1.77
5/ 3/75			1.18	0.15	0.88	0.74	0.88	0.15	0.59		0.59	0.88
5/10/75			0.98	0.70	1.12	1.26	1.12				1.26	2.10
5/17/75			0.70		1.54	1.26	0.84				1.26	0.84
5/24/75			0.16	0.47	1.56	0.62	0.62	0.47			0.78	0.62
5/31/75			0.31	0.62	1.87	0.78	0.78		0.47		0.78	0.62
6/10/75					0.85	0.14	0.57		0.57		0.57	0.57
6/14/75			0.28	0.42	1.13	0.42	0.42		0.28		0.28	0.28
6/21/75			0.99	0.87	1.62	0.87	0.75		0.87		0.99	0.87
6/28/75		0.46	0.35	0.46		0.58	0.46		0.46		0.46	0.58
7/ 5/75		0.35	0.81	0.46		0.46	0.46		0.46		0.46	0.46
7/12/75		0.33	0.43	0.54		0.54	0.43		0.43		0.76	0.54
7/19/75		0.33	0.43	0.43		0.87	0.54		0.43		0.43	0.43
8/ 9/75		0.86	1.10	1.10	1.59	1.47	0.86		0.98		0.86	0.86
11/ 9/75	0.52	0.52	1.05		1.67	0.94	1.15		1.25	0.63	1.36	2.40

Little Cottonwood Creek (parameter--Sodium in mg/l).

Date	Site											
	1B	1	2	3	3A	4	5	6	7	8	9	10
11/23/74			4.10	7.13		6.26	6.26		6.05	3.13	7.45	9.72
12/ 1/74		2.16	4.10				5.83		5.72	2.27	8.10	9.07
12/27/74			5.30	5.07	6.80	5.76					7.95	16.77
12/29/74			6.04	6.62	8.71	6.85					17.18	21.48
1/18/75			5.99	4.73	7.72	5.76					8.07	18.87
1/25/75			30.49	4.75	8.09	6.15	8.63	4.21	7.88	3.56	8.20	16.82
2/ 2/75			7.88	3.99	6.80	5.83	6.48				8.85	14.72
2/ 8/75			6.12	5.80	7.98	6.78	7.11				8.31	22.38
2/15/75			7.87	3.61		5.80			6.89		7.65	19.18
2/22/75			7.65	4.37	6.67	5.90	7.33				7.76	21.31
3/ 1/75			45.70	5.12	19.13	6.71	15.94				9.56	20.19
3/ 8/75			73.35	5.37	27.51	7.73	8.38	7.30	8.16	6.55	21.39	19.36
3/15/75			99.84	5.69	24.45	7.20	19.36				19.36	20.38
3/29/75			23.18	7.15	17.91	8.64					21.07	18.96
4/ 5/75			17.91	5.30	18.96	9.10	9.45	6.91	13.70	5.07	16.86	18.96
4/12/75			96.79	11.70	22.34	17.02	20.21				18.08	18.08
4/19/75			53.18	9.57	25.53	13.83	13.83				21.27	18.08
4/26/75			90.89	9.74	36.79	20.56	17.31				19.48	14.07
5/ 3/75			33.54	15.15	31.38	19.48	18.39	16.23	5.41	19.48	15.15	15.15
5/10/75			39.30	21.72	24.82	20.68	27.92				19.65	14.48
5/17/75			18.61		36.19	25.85	19.65				13.44	14.48
5/24/75			5.34	12.82	21.37	14.96	20.30				16.02	14.96
5/31/75			5.34	11.75	26.71	11.75	17.09	4.27	13.89		11.75	11.75
6/10/75			1.04		13.55	1.04	4.17		4.17		3.13	3.13
6/14/75					11.46							
6/21/75			3.19	4.25	13.81	5.31	6.38		6.38		6.38	7.44
6/28/75		1.93	1.93	3.86		1.93	3.86		3.86		4.83	3.86
7/ 5/75			3.86	2.90		2.90	2.90				3.86	3.86
7/12/75		2.91	2.91	3.88		3.88	3.88		4.85		4.85	4.85
7/19/75		2.91	2.91	2.91		3.88	4.85		4.85		4.85	4.85
8/ 9/75		19.77	3.25	3.61	6.99	3.97	4.82		4.70		5.06	5.90
11/ 9/75	1.70	2.04	4.77		8.29	5.90	8.40		1.93	3.52	9.99	22.36

Little Cottonwood Creek (parameter--Potassium in mg/l).

Date	Site											
	1B	1	2	3	3A	4	5	6	7	8	9	10
11/23/74			0.45	0.56		0.89	0.78		0.89	0.33	1.34	2.45
12/ 1/74		0.89	1.34				1.90		1.45	0.67	1.56	3.35
12/27/74			1.14	1.02	1.59	1.14					1.59	2.73
12/29/74			1.03	1.26	1.61	0.92					2.07	1.26
1/18/75			0.68	0.68	1.25	0.80					1.14	2.96
1/25/75			0.84	0.74	1.37	0.95	0.95	0.42	0.95	0.21	1.47	2.42
2/ 2/75			0.74	0.84	1.37	0.84	0.95				1.58	2.21
2/ 8/75			0.76	0.98	1.53	1.09	0.98				1.74	2.73
2/15/75			1.09	1.09		1.31			1.09		1.42	2.40
2/22/75			0.87	0.87	1.31	0.98	0.87				1.09	2.29
3/ 1/75			1.06	1.06	1.48	1.27	2.75				1.90	2.75
3/ 8/75			0.66	0.66	1.20	0.88	0.98	0.88	1.31	0.44	1.64	2.63
3/15/75			1.53	0.66	1.20	0.77	0.77				1.42	2.30
3/29/75			1.25	1.25	1.50	1.50					1.99	2.74
4/ 5/75			1.76	1.35	1.76	1.62	1.49	1.49	2.97	1.08	2.16	3.24
4/12/75			8.92	3.24	1.49	2.03	1.08				1.35	2.16
4/19/75			0.81	0.68	1.22	0.95	1.08				1.49	2.16
4/26/75			1.03	0.59	0.88	0.44	0.88				1.03	1.77
5/ 3/75			1.18	0.15	0.88	0.74	0.88	0.15	0.59		0.59	0.88
5/10/75			0.98	0.70	1.12	1.26	1.12				1.26	2.10
5/17/75			0.70		1.54	1.26	0.84				1.26	0.84
5/24/75			0.16	0.47	1.56	0.62	0.62				0.78	0.62
5/31/75			0.31	0.62	1.87	0.78	0.78		0.47		0.78	0.62
6/10/75					0.85	0.14	0.57		0.57		0.57	0.57
6/14/75			0.28	0.42	1.13	0.42	0.42		0.28		0.28	0.28
6/21/75			0.99	0.87	1.62	0.87	0.75		0.87		0.99	0.87
6/28/75		0.46	0.35	0.46		0.58	0.46		0.46		0.46	0.58
7/ 5/75		0.35	0.81	0.46		0.46	0.46		0.46		0.46	0.46
7/12/75		0.33	0.43	0.54		0.54	0.43		0.43		0.76	0.54
7/19/75		0.33	0.43	0.43		0.87	0.54		0.43		0.43	0.43
8/ 9/75		0.86	1.10	1.10	1.59	1.47	0.86		0.98		0.86	0.86
11/ 9/75	0.52	0.52	1.05		1.67	0.94	1.15		1.25	0.63	1.36	2.40

Table F-3. Results of regular sample runs.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l
1/22/74	1	7.10				2.55	126.6		13.0		28	2.0		24.9	0.0	4.4		93	
	2	7.17				1.27	109.2		11.1		136			14.9	0.0	1.4		193	
	3	7.41				1.63	149.4		13.0		146	27.2		6.0	0.2			162	
	4	7.20				1.27	177.2	2.5	24.8					10.0	0.0			147	
	5	7.00				0.92	173.8		8.7					1.3	0.6	1.2		108	
	6	7.12				1.20	187.3	5.6	32.8					6.0	0.0			135	
	7	7.00				0.57	103.9	2.5	11.8					3.0	0.0	0.2		67	
	8																		
	9	7.15				0.85	146.8		11.1		164	13.5		46.0	0.2	3.4		92	
	10	7.15				1.91	434.6		8.7		113	1.8		30.7	7.0	5.6		126	
1/24/74	1	7.12				1.13	100.4	2.5	21.1		106			33.0	0.0	25.0		116	
	2	7.20				1.41	96.4	2.5	14.9		261	0.3		10.4	0.0	0.0		265	
	3	7.41				1.41	150.7	2.5	11.1		238	10.8		1.4	0.2	7.4		202	
	4	7.48				1.13	185.2		13.0		124			3.1	0.0	44.0		162	
	5	7.25				1.27	207.0		9.9					0.3	0.2	23.0		156	
	6	7.20				0.64	198.7		16.1		84	0.3		6.8	0.0	0.2		108	
	7	7.41				0.57	211.7	2.5	8.0		50			3.1	0.0	28.4			
	8	7.29				0.49	112.9	2.5	10.5					4.6	0.4	43.2		79	
	9	7.31				0.92	186.9		11.1		147	0.2		8.4	0.0	3.8		99	
	10	7.20				2.05	404.7	2.5	10.5		196	2.2		18.6	5.8	7.0		136	
1/26/74	1	7.30		261		0.53	45.2		19.7	3.1	78			146.0	0.2	1.0		107	36
	2					0.42	36.2		19.0		219				0.2	0.6			
	3													30.0	0.0	0.0			
	4	7.75		386		0.47	58.5		31.3	14.7	191			85.0	0.2	33.2		155	48
	5	8.05		352		0.77	67.7		51.7	6.3	88	1.4		32.0	0.4	10.8		136	41
	6	7.95		258		0.42	50.7		41.5	3.1	130	1.4			0.0	4.4		98	35
	7	7.35		318		0.95	61.6		22.4	11.0	123	0.4		19.0	0.0	21.0		123	39
	8	7.70		150		0.42	35.6		15.6	2.6	58	3.3			0.0	7.4		56	20
	9	7.85		272		0.59	78.3		18.4	17.8	26	1.2		139.0	0.8	3.6		93	31
	10	8.00		340		1.13	154.8		12.9	22.0	121			44.0	1.6	1.2		111	37

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l
1/31/74	1					0.47	10.0		10.9		170	0.2		24.0	0.0	0.2			
	2					0.95	18.0		12.9		225			25.0	0.0	0.6			
	3					0.71	38.4		15.6			36.6		1.4	0.0				
	4					0.59	49.0		24.5		203	2.6		4.9	0.6	12.4			
	5					0.59	55.3		12.9		75	3.2		6.6	2.2	9.2			
	6					0.47	36.1		18.4		105			5.1	0.2	0.8			
	7					0.83	47.5		18.4		98			23.0	3.4	12.6			
	8					0.53	26.3		12.9		26			8.3	0.0	0.2			
	9					0.42	54.5		15.0		38	2.2		46.0		0.4			
	10					0.59	149.3		19.7		80			49.0	5.0	0.8			
2/2/74	1	8.05		230		0.89	36.1		2.7	1.3				17.6	0.0	0.2	1.8	133	30
	2	8.21		429		0.53	19.4		8.8	1.8				21.7	0.0	0.6	2.1	220	57
	3	8.11		425		0.53	29.5		10.9	4.8				2.6	0.0	0.0	2.1	202	58
	4	8.34		380		0.47	43.1		6.1	9.2				15.2	0.0	9.4	2.2	188	49
	5	8.31		350		0.83	52.8		15.0	12.0				7.4	1.2	10.0	0.1	154	40
	6	8.10		262		0.18	44.6		8.2	2.6				4.0	0.0	1.2	1.8	106	39
	7	8.19		325		0.71	60.8		11.6	11.5				18.0	1.4	9.8	1.6	125	37
	8	7.99		168		0.36	51.4		12.2	3.8				11.0	0.0	0.0	1.5	90	24
	9													76.0	2.6	13.4	1.6		
	10	8.15		330		0.77	130.2		17.7	22.2				103.0	2.0		1.2	133	38
2/5/74	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
	9													14.6	0.0	0.8	0.0		
	10													27.4	22.0	0.8	0.0		

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l
2/7/74	1	7.95		221		0.71	20.8		5.4	0.8				4.3	0.0	0.0	1.3	113	30
	2													0.0	0.0	0.2	1.5		
	3	8.05		399		0.30	41.7		14.3	5.4				1.1	0.0	0.0	1.5	227	58
	4	8.31		344		0.53	61.0		12.9	8.7				2.0	0.0	8.0	1.5	185	49
	5	8.30		319		0.59	61.6		10.2	10.7				0.6	0.0	3.2	1.5	163	38
	6	8.11		265		0.36	71.0		12.9	3.1				0.6	0.0	0.2	1.6	108	39
	7	8.20		319		0.65	50.5		7.5	3.1				2.9	0.0	2.2	1.6	133	36
	8	7.96		160		0.42	58.0		8.2	11.0				0.3	0.0	0.4	1.4	66	23
	9	8.15		241		0.53	83.1		8.8	13.5				8.0	0.0	0.8	1.9	111	32
	10	8.11		292		0.65	165.0		6.1	21.7				1.1	0.2	0.4	1.8	126	39
2/9/74	1	7.89			12.3		109.5			2.1				0.8	0.0	1.6	0.4	152	29
	2	8.05			17.0		70.7							0.0	0.0	0.0	0.8	207	55
	3	8.01			8.3		64.7			10.6				4.4	0.0	0.0	1.1	195	54
	4	8.00			6.0		76.3			12.7				0.0	0.0	5.4	1.0	166	48
	5													0.0	0.0	5.2	2.0		
	6	7.91			12.3		121.5			4.2				1.6	0.0	0.2	0.7	103	40
	7	8.10			8.3		123.0			11.6				2.8	0.0	1.0	1.0	129	39
	8	8.05			8.3		45.1			3.2				1.2	0.0	0.0	0.4	61	22
	9													1.2	0.0	1.0	0.8		
	10	7.91			2.8		173.2			21.1				2.0	0.2	0.4	0.6	124	38
2/12/74	1	8.00		248	13.9		178.5			2.1				0.4	0.0	1.4	2.7	130	31
	2	7.95		396	4.4		36.3			3.2				0.8	0.0	1.4	1.5	215	59
	3	7.95		432	8.3		89.6			8.5				0.0	0.0	0.2	3.0	198	53
	4	8.08		372	7.6		130.3			10.6				0.4	0.0	2.8	4.3	163	40
	5	8.00		339	9.9		114.8			11.6				0.4	0.0	1.4	1.5	148	41
	6	8.02		332	13.1		56.8			3.2				1.2	0.0	0.0	1.8	105	40
	7	7.99		261	6.8		98.1			11.6				0.8	0.0	0.0	1.6	132	40
	8	8.05		310	9.9		87.7			3.2				1.2	0.0	2.2	1.8	62	23
	9	7.89		155	8.3		71.0			14.8				3.6	0.0	0.4	1.6	115	31
	10	7.85		263	8.3		323.7			20.6				0.8	1.0	2.0	1.3	138	39

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l
2/14/74	1	8.00		445	6.0		89.3		32.9	1.1				22.8	0.0	0.4	2.7	112	23
	2	7.95		221	0.5		67.2		9.8	3.2				2.8	0.0	0.0	1.8	219	57
	3	7.95		430	4.4		52.7		32.9	8.5				3.2	0.0	0.2	1.8	204	53
	4	8.01		373	6.0		56.8		4.0	11.6				4.4	0.0	23.6	1.9	177	46
	5	8.12		317	12.3		110.1		32.9	11.6				5.6	0.0	1.2	2.0	102	34
	6	8.11		249	13.9		155.5		15.6	3.2				4.8	0.0	0.0	2.4	106	39
	7	8.00		314	14.6		73.8		15.6	12.7				7.2	0.0	0.0	2.6	139	25
	8	8.05		158	6.0		42.3		38.7	3.2				12.4	0.0	0.6	2.2	71	24
	9	8.05		276	12.3		143.5		4.0	16.9				46.8	0.0	0.0	2.2	105	32
	10	8.02		305	8.3		297.2		27.2	27.0				30.0	0.0	1.2	2.0	100	33
2/18/74	1	7.45		244	12.3		44.4		15.6	2.1	154			6.4	0.0	0.2	1.0	112	32
	2	7.73		439	12.3		44.8			3.1	258			6.4	2.6	0.0	1.5	194	55
	3	7.91		435	10.7		127.0		4.0	8.4	244			3.8	1.8	0.0	0.8	199	50
	4	8.05		371	13.9		96.3		4.0	10.5	219			3.4	0.4	3.8	0.6	155	41
	5	7.60		342	8.3		107.1		4.0	11.5	184			1.2	0.0	1.2	0.6	134	38
	6	7.90		265	10.7		86.3		21.4	2.6	146			2.8	0.4	0.0	0.6	102	33
	7	7.89		321	13.1		184.6		38.7	11.0	185			4.4	0.0	2.7	0.9	124	36
	8	8.05		157	8.3		112.9		1.2	2.1	151			5.4	0.0	0.0	0.4	58	24
	9	7.92		270	13.9		206.2		4.0	16.8	163			7.6	0.0	0.0	0.9	94	30
	10													12.8	1.8	2.0	1.3		
2/19/74	1	7.30		251	15.6		32.4		15.6	3.1	157	0.2		2.0	0.0	0.0	4.2	106	29
	2																		
	3	7.55		448	18.0		56.8		24.3	9.4	259			1.8	0.0	0.0	0.8	186	51
	4	7.90		373	13.3		78.0		32.9	10.0	192	1.4		0.8	0.0	9.8	0.5	153	47
	5																		
	6																		
	7																		
	8																		
	9																		
	10	8.00		317	20.4		401.2		6.9	20.4	184	0.1				1.4	0.4	114	36

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l
2/21/74	1	7.40		355			86.7			12.6				0.0	0.0	0.0	1.4	130	41
	2	7.20	101.0	425			32.0		15.6	5.2	145	4.6		0.0	0.0	0.0	1.5	182	49
	3	7.60	115.0	440			48.5		9.8	8.4	170	1.7		0.0	0.0	0.0	0.4	181	52
	4	7.90	113.0	366			71.4		44.5	11.5	118	11.6		0.0	0.0	6.0	2.0	159	47
	5		98.0						47.4		122	9.8		0.0	0.0	4.2	1.5		
	6	8.05	33.0	258			56.4		4.0	3.1	78	3.5		0.0	0.0	1.4	1.3	104	35
	7	7.95	83.0	313			83.8		24.3	12.6	84	5.8		0.0	0.0	10.4	1.3	122	40
	8	7.50	35.0	155			44.8		4.0	2.6	25	9.4		0.0	0.0	0.0	1.6	63	22
	9	7.60	71.0	294			98.8		15.6	25.2	54	3.5		0.0	1.4	4.0	1.4	91	33
	10	7.55	88.0	321			202.1		32.9	20.4	66	4.7		0.0	0.0	0.4	1.5	114	37
2/23/74	1			213	71.3	1.41			21.3	1.4				14.0	0.0	0.2		103	27
	2			461	35.9	0.39			28.0	1.4				0.0	0.0	1.0		194	53
	3			446	32.0	0.44			21.9	10.8				0.0	0.0	0.4	2.1	192	56
	4			387	42.2	0.34			10.9	14.4				1.6	0.0	6.0		160	45
	5			348	35.9	0.39			8.5	14.9				2.8	0.0	2.4		139	43
	6			268	32.0	2.04			7.3	3.2				1.6	0.0	0.0	1.8	114	40
	7			321	24.1	1.75			4.3	13.8				7.6	0.0	0.6	2.5	135	39
	8			160	28.0	0.58			4.9					2.0	0.0	0.6	2.8		
	9			275	22.5	1.70			2.4	21.4				13.6	0.0	0.4	2.7	102	32
	10			320	42.2	0.44			0.6	23.8				16.4	3.0	6.0		120	38
2/26/74	1	7.35	90.0	259		1.76	37.1			3.8	46	1.4	131	9.6	0.0	0.8	1.6	117	30
	2	7.25	100.0	446		0.69				4.9			257	1.6	0.0	0.0	2.3	199	56
	3	7.22	112.0	464		0.16	141.2			10.8	172	0.6	350	2.0	0.0	0.2	1.5	197	59
	4	7.65	120.0	385		0.32	168.2			21.4	153	3.2	185	4.8	0.0	4.4	1.5	106	34
	5	7.65	104.0	360		0.27	197.0			14.9	158	4.1	174	2.4	0.0	2.6	1.7	112	43
	6	7.05	32.0	274		0.43	195.2			3.8	121	1.0	130	1.2	0.0	2.4	1.7	114	41
	7	6.90	77.0	333		0.48	193.7			14.9		2.2	148	12.0	0.0	0.4	1.8	134	39
	8	6.90	37.0	168		0.32	109.7			3.2	5	3.6	71	2.0	0.0	1.0	1.7	79	24
	9	7.40	73.0	285		0.32				20.8			120	22.0	0.0	0.4	1.6	103	
	10	7.35	94.0	336		0.59	441.2			22.6	92	5.9	165	16.8	3.0	3.0	2.4	120	41

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l
2/28/74	1	7.23	91.0	258	56.4	0.97	21.9	1.0	13.0	2.6	81			7.6	0.0	0.4	2.0	123	33	25.8
	2	7.30	118.0	448	46.1	0.29	98.4		3.0	4.9	193				0.0	0.2	1.2	200	56	110.0
	3	7.10	117.0	453	57.2	0.44	100.3		1.5	12.0	230			0.0	0.0	0.0	1.7	195	59	43.3
	4	7.63	117.0	389	61.1	0.49	128.4	0.8	2.0	12.6	130			2.8	0.0	7.6	1.4	161	47	61.7
	5	7.40	103.0	353	43.8	0.34	163.4		2.0	15.5	153			2.0	0.0	2.4	1.4	144	43	39.2
	6	6.90	32.0	271	61.9	0.53	123.0	1.3	1.5	2.6				1.2	0.2	0.6	1.2	103	40	5.8
	7	7.35	88.0	329	58.7	0.29	152.1	1.0	2.0	14.4				1.6	0.0	1.2	1.7	127	41	25.0
	8	6.50	37.0	164	46.1	0.24	101.8	0.3		3.8	64			0.4	0.0	0.0	1.2		24	19.2
	9	7.30	75.0	281	45.4	0.44	111.7	1.5	1.5	20.8	113			17.6	0.0	0.4	1.2	109	34	15.8
	10	7.35	93.0	332		0.34	329.9	0.8		22.6	132			52.0	2.8	1.0	1.2	121	39	12.5
3/2/74	1	7.35	90.0	240	40.7	1.35	27.2				196	16.9	133	5.2	0.0	1.0	2.1	114	33	
	2	6.60	75.0	418	86.6	0.14	71.0			6.9	312	14.2	278	0.0	0.0	0.0	3.6	196	49	
	3	7.10	111.0	432	54.8	0.57	159.2			7.5	308	3.4	277	2.8	0.0	0.8	9.4	212	49	
	4	7.70	115.0	374	32.6	0.28	162.1			10.3	264	3.7	217	7.2	0.0	2.8	2.5	180	44	
	5	7.70	99.0	339	36.9	0.43	192.2			13.8	218	2.3	199	9.6	0.0	2.4	2.2	152	40	
	6	7.20	32.0	258	10.4	1.28	166.6				188	1.6	168	4.4	0.0	0.0	2.4	120	40	
	7	7.65	85.0	290	32.6	0.36	185.6			11.5	193	2.5	183	17.2	0.0	2.8	1.3	124	42	
	8	7.15	37.0	156	24.5		114.1				114	0.7	100	2.4	0.0	0.2	2.3	68	23	
	9	7.40	68.0	266	66.6	0.28	195.7				184	5.9	147	34.8	0.0	1.2	0.9	110		
	10	7.45	86.0	304	87.2	0.57	396.8			19.0	196	5.8	182		15.8	2.4	0.9	136	36	
3/5/74	1	7.10	94.0	228	44.3	1.06	23.7	1.4	6.1	0.6	154		130	12.4	0.0	0.4	1.4	105	29	
	2	7.18	110.0	416	48.8	0.33	58.0		9.8	4.0	263		290	0.0	0.0	0.4	0.9	192	55	
	3	7.11	109.0	431	45.0	0.33	111.8		3.0	10.9	271		329	3.2	0.0	0.2	0.9	197	56	
	4	7.35	112.0	348	72.6	0.28	71.9	0.7	12.2	10.9	209		269	7.6	0.0	1.6	0.9	181	45	
	5	7.10	98.0	323	48.0	0.39	124.3	1.0	1.8	12.6	188		232	1.2	0.0	0.9	1.0	138	37	
	6	6.60	30.0	245	61.5	0.28	100.6		3.0		173		209	6.4	0.0	2.6	1.1	102	38	
	7																			
	8																			
	9	7.00	69.0	274	56.2	0.39	92.9	1.0	1.2	24.7	126		164	20.0	0.0	1.0	1.3	104		
	10	6.80	87.0	311	95.8	0.44	264.2		1.8	24.1	158		200	31.0	1.6	2.6	1.0	122	39	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l
3/7/74	1	6.95	89.0	253	86.4	4.01	37.9	2.5	2.4	1.2	68	2.0	62	10.0	0.0	0.0		105	30
	2	7.20	107.0	464	36.4	0.38	95.6	0.9	3.6	5.3	218	3.8	240	0.4	0.0	0.2	1.9	194	57
	3	7.30	112.0	485	36.4	0.32	106.4	3.5	3.6	9.9	212	2.7	247	3.2	0.0	0.0	2.3	194	55
	4	7.65	118.0	399	33.0	0.32	146.8	1.6	3.0	9.9	142	1.8	179	4.4	0.0	1.0	1.4	156	41
	5	7.60	102.0	374	39.9	0.32	156.6	1.6	3.0	11.7	139	2.7	167	2.4	0.0	0.0	1.9	140	40
	6	7.10	31.0	288	36.4	0.19	120.0	1.9	3.6	1.8	114	1.1	149	4.4	0.0	0.0	1.7	105	37
	7	7.55	87.0	354	42.6	0.32	134.2	1.9	3.6	12.3	126	2.0	150	15.6	0.0	0.4	1.2	127	37
	8	7.10	38.0	180	43.3	0.19	60.8	1.9	2.4	1.2	36	1.6	87	2.4	0.0	0.6	0.9	65	24
	9	7.45	74.0	332	35.1	0.25	91.2	1.3	3.0	28.6	154	1.9	131	29.6	0.0	0.4	1.6	99	35
	10	7.50	93.0	346	50.1	0.45	268.6	2.2	3.0	18.7	127	1.9	100	32.0	0.0	1.4	1.8	119	37
3/9/74	1	6.60	82.0	225		1.41	36.0	0.6	1.2			1.8	121	4.8	0.0	0.0	2.3	104	
	2	6.80	99.0	438		3.85	71.4	0.6	1.2	7.6	146	7.2	273	0.0	0.0	0.4	2.9	192	
	3	6.95	110.0	449		1.09	121.7	0.9	1.8	11.8	148	1.8	262	1.6	0.0	0.2	2.4	193	
	4	7.45	115.0	367		0.96	151.0	6.4	10.7	11.8	148	2.4	197	4.4	0.0	5.0		157	
	5	7.35	108.0	336		0.32	163.6	1.5	7.7	15.4	141	0.4	165	2.4	0.0	3.8	1.9	140	
	6	6.80	31.0	265		0.26	132.8	2.3	3.6	2.4	100		139	0.8	0.0	0.0	1.5	102	
	7	7.25	85.0	313		0.32	139.6	1.2	1.2	12.8	121	1.1	142	1.2	0.0	0.8		125	
	8	6.70	37.0	165		0.13	73.7	2.3	3.0	6.5		0.3	73	1.2	0.0	0.0	2.6	64	
	9	7.20	72.0	298		0.32	158.1	1.8	2.4	28.5	106	1.2	132	0.0	0.0	0.4	1.9	98	
	10	7.15	94.0	319		0.64	394.2	2.9	3.0	18.6	131	0.6	122	0.0	0.2	3.2	2.0	118	
3/12/74	1	7.00	86.0	233	34.3	0.21	66.6	1.4		1.8	146	4.5	153	23.6	0.2	8.4	1.6	104	
	2	7.05	94.0	420	82.6	0.42	84.3	0.7		6.0	176	12.1	284	0.0	0.0	0.0	1.0	188	
	3	7.15	104.0	447	44.2	0.16	198.7	1.4		13.3	268	9.5	287	22.4	0.0	0.2	1.5	186	
	4	7.55	113.0	381	39.8	0.16	188.8	2.4		13.3	219	4.3	216	15.2	0.0	5.0	1.1	167	
	5	7.60	98.0	358	70.5	0.37	201.2	2.1		16.0	209	4.0	205	3.6	0.0	3.4	1.2	144	
	6	6.95	33.0	273	47.5	0.26	172.3	2.4		1.8	174	2.9	158	6.8	0.0	1.2		106	
	7	7.50	85.0	323	44.2	0.57	179.2	1.7		13.9	189	3.4	188	23.2	0.0	1.8	1.3	124	
	8	6.95	38.0	164	43.1	0.26	99.8	2.8		1.8	133	3.3	110	15.2	0.0	0.8	1.1	64	
	9	7.35	70.0	304	53.0	0.37	182.5	2.1		28.0	184	3.4	181	18.4	0.0	1.6	1.1	100	
	10	7.40	89.0	316	42.0	0.63	426.1	3.1		19.1	174	3.7	200	22.8	0.0	0.0	1.1	123	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
3/14/74	1	6.95	86.0	243	62.6	1.02	44.3	1.8	3.0	2.8		1.1	128	12.4	0.0	0.2	2.1	101
	2	6.90	96.0	439	66.1	0.90	87.8	0.6	10.4	19.3		43.4	319	0.0	0.0	0.0	1.1	185
	3	7.05	102.0	458	54.1	0.72	173.3	1.8	2.4	18.8		1.6	336	4.0	0.0	0.6	1.2	186
	4	7.40	107.0	381	38.5	0.54	185.1	0.6	1.8	18.2		2.2	248	4.0	0.2	3.4	1.1	151
	5	7.45	98.0	357	37.1	1.68	164.4	0.3	1.8	18.2		1.3	221	1.6	0.0	0.4	1.1	139
	6	6.65	31.0	265	49.8	0.42	165.6	1.2	2.4	2.8		0.1	85	2.0	0.0		1.3	101
	7	7.35	82.0	323	37.8	0.54	158.4	0.6	14.0	17.1		0.1	126	9.2	0.0	0.2	1.0	127
	8	6.75	37.0	171		0.30	74.4	1.2	3.0	2.8		0.4	60	4.4	0.0	0.2	0.9	63
	9	7.20	67.0	298		0.54	178.7	2.1	3.0	28.1		6.7	189	26.0	0.0	0.6	0.7	98
	10	6.95	91.0	323	49.1	0.90	347.1	2.1	3.0	21.5		0.7	222	30.4	0.4	2.6	2.0	119
3/16/74	1	7.12	89.0	243		0.50		2.8	10.4	2.2	75	0.2	24	4.0	0.0	1.4	4.1	117
	2	7.20	96.0	549		1.44		1.8	10.4		281	6.6	284	0.0	0.0	1.4	1.9	
	3	7.18	102.0	535		1.44		1.5	5.5	38.8	221	0.7	206	10.0	0.0	1.8	0.6	217
	4	7.45	104.0	405		0.19		0.9	4.3	21.3	173	1.0	131	6.4	0.0	3.4	0.7	169
	5	7.45	94.0	368		0.25		1.2	3.1	21.3	49	1.0	134	7.2	0.0	0.6	1.2	152
	6	6.83	32.0	256		0.37		0.6	4.3	2.7	128	1.0	124	6.4	0.0	1.8	0.5	121
	7	7.42	79.0	331		0.37		0.9	8.0	20.2	87	0.8	125	17.2	0.0	1.2	0.7	152
	8	6.88	39.0	166		0.19		1.2	9.8	2.7	5	0.1	24	1.2	0.0	0.2	0.2	98
	9	7.28	67.0	293		0.19		1.2	3.1	27.9	114	0.8	113	6.4	0.0	1.0	1.2	108
	10	7.25	78.0	288		0.37		0.9	3.7	18.6	116	0.2	136	10.0	0.4	4.6	0.9	121
3/19/74	1	6.92	94.0	230	62.3	0.38	62.7	2.4	2.7	2.2	147	2.6	156	14.4	0.0	2.4	0.2	117
	2	6.70	77.0	529	57.6	0.89	153.2	1.0	23.0	37.7	319	12.9	348	0.4	0.0	0.4	0.8	223
	3	7.10	103.0	554	69.9	0.57	283.6	4.4	6.8	41.6	338	9.1	327	8.4	0.0	0.2	0.3	229
	4	7.45	101.0	397	51.0	0.38	283.5	1.7	7.4	23.5	234	8.8	192	18.0	0.0	4.0	0.9	183
	5	7.45	91.0	364	79.3	0.45	327.0	0.7	5.4	23.5	206	4.4	184	4.8	0.0	1.8	1.2	167
	6	6.68	31.0	247	50.0	0.38	258.6	1.7	4.1	3.8	135	2.3	118	6.0	0.0	0.8	0.8	108
	7	7.30	78.0	323	69.9	0.51	286.6	0.7	3.4	21.9	192	11.9	151	22.4	0.0	0.2	1.4	144
	8	6.80	36.0		51.0	0.25	113.0	1.0	18.2	2.7	91	0.3	104	3.3	0.0	0.4		79
	9	7.20	64.0	297	90.6	0.95	281.8	1.4	8.1	33.4	127	2.0	125	26.8	0.0	0.2	4.6	108
	10	7.30	89.0	290	57.6	0.64	536.4	6.8	10.8	19.7	153	2.4	155	22.0	0.2	1.6		133

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Iron µg/l
3/21/74	1	8.00	89.0	206	193.9	0.11	131.6		9.1	2.4	146	0.7	104	2.8	0.0	0.0	0.9	117	
	2	7.50	71.0	458	76.7	0.37	109.9	1.2	19.5	21.2	247	5.2		0.0	0.0	0.0	1.8	220	
	3	7.70	115.0	505	65.3	0.43	258.0	4.3	17.7	32.5	152	2.3	288	2.0	0.0	0.2	1.0	223	
	4	8.20	117.0	375	46.0	0.37	287.7	1.8	15.2	22.3	110	4.1	236	4.8	0.0	0.2	1.1	181	
	5	8.10	98.0	334	88.1	0.27	335.5	4.3	16.5	22.8	125	2.0	173	0.8	0.0	0.0	1.2	156	
	6	7.60	32.0	242	85.3	0.05	253.4	0.3	12.2	2.4	42	1.1	89	3.2	0.0	0.0	0.9	113	
	7	8.05	83.0	310	71.0	0.27	304.3	0.3	12.2	20.7	54	4.6	92	10.8	0.0	0.4	1.0	140	
	8	7.45	39.0	151	82.4	0.05	97.1	1.2	12.8	2.4		0.9	12	1.2	0.0	0.0	1.0	86	
	9	7.90	70.0	268	43.9	0.27	182.5	1.8	19.5	26.1	138	5.8	141	10.8	0.0	0.2	1.7	111	
	10	7.85	92.0	289	121.0	0.53	340.2	1.8	13.4	19.1	129	15.1	88	4.8	1.2	4.4	0.9	131	
3/24/74	1	7.72	83.0	215	98.4	0.19	73.6	0.6		1.7	88	1.9		18.8	0.0	0.4	1.9	116	
	2	7.15	78.0	416	83.0	0.13	77.9	1.3	50.9	10.2	308	15.2		0.0	0.0	0.0	0.9	216	
	3	7.43	104.0	479	146.8	0.19	171.5	1.6	2.5	26.7	331	3.0		12.4	0.4	3.2	1.0	220	
	4	7.80	102.0	390	65.3	0.32	188.4	1.6	3.1	22.4	246	6.1		12.4	0.0	1.8	1.1	176	
	5	7.98	90.0	351	59.2	0.38	229.4	1.6	6.9	23.5	225	4.6		4.8	0.0	0.2	1.3	152	
	6	7.30	29.0	237	117.6	0.13	180.0	3.1	3.8	2.8	42	1.2		4.4	0.0	0.8	0.8	106	
	7	7.75	76.0	314	67.6	0.25	202.6	1.3	3.1	22.4	222	2.6		16.0	0.0	0.8	1.2	140	
	8	7.25	37.0	145	59.9	0.13	87.8	1.9	15.7	2.2	101	1.9		10.8	0.0	0.4	1.0	72	
	9	7.78	65.0	279	74.5	0.50	124.3	2.2	8.8	25.1	181	2.9		12.0	0.0	0.0	3.0	108	
	10	7.70	85.0	281	89.9	0.44	189.7	0.6	4.4	18.2	79	1.6		20.8	0.2	0.4	1.2	128	
3/26/74	1	7.75	81.0	205	70.2	0.26	56.5	1.0	14.4	3.3	110	2.3	119	0.0	0.0	1.0	3.1	102	29.4
	2	7.55	94.0	459	51.3	0.73	115.8	0.7	40.7	27.9	234	8.9	289	0.0	0.0	0.0	0.2	186	264.7
	3	7.60	100.0	496	47.9	0.73	280.8	1.0	16.4	40.5	284	4.0	330	3.2	0.0	0.6	1.8	210	154.1
	4	7.95	100.0	389	80.2	0.73	284.7	1.3	15.1	31.2	170	4.9	248	2.4	0.0	11.0	0.9	168	107.1
	5	8.10	87.0	355	39.1	1.06	335.6	0.7	9.8	31.7	225	3.2	210	1.6	0.0	9.0	0.9	140	83.5
	6	7.35	30.0	241	32.4	0.26	186.3	2.0	7.9	1.1	153	1.0	159	3.6	0.2	0.0	1.0	108	4.1
	7	7.85	74.0	321	24.6	0.46	279.3	2.3	14.4	29.0	178	2.2	193	4.8	0.0	5.4	0.8	130	48.8
	8	7.35	36.0	156	44.6	0.26	98.2	3.6	6.6	3.3	77	1.5	94	1.2	0.0	0.0	0.8	94	
	9	7.90	68.0	245	44.6	0.33	242.5	2.3	7.9	29.0	101	1.8	155	8.0	0.0	1.2	1.3	108	5.3
	10	7.85	85.0	281	43.5	0.73	463.6	4.6	4.6	19.7	156	1.0	168	6.4	0.0	5.2	1.7	120	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Iron µg/l
3/28/74	1	7.92	84.0	205		0.18	58.1	4.9	23.0	3.3	238		148	1.2	0.0	0.8	1.3	109	19.8
	2	8.05	115.0	541		1.72	121.2	8.0	19.0	51.4	463		364	0.0	0.0	0.2	2.1	212	29.0
	3	7.85	105.0	542		1.19	279.2	3.7	14.9	58.0	419		372	5.2	0.0	0.6	1.4	241	178.4
	4	8.00	102.0	382		0.53	265.4	3.4	11.5	31.7	283		259	8.8	0.0	2.8	1.3	170	124.1
	5																		
	6																		
	7																		
	8																		
	9	7.80	67.0	254		0.30	261.6	4.3	7.5	29.0	202			21.6	0.2	0.2	1.6	102	
	10																		
3/30/74	1	7.85	78.0	231		0.19		5.2		2.9	168	1.0	189	3.6	0.0	1.3	1.5	112	
	2	7.45	88.0	433		0.44	60.6	0.9	18.8	16.8	331	9.7	340	0.4	0.0	0.0	1.5	210	
	3	7.68	113.0	520		0.57	312.4	2.1	4.3	38.2	358	2.6	368	3.2	0.0	0.4	1.7	233	
	4	8.00	102.0	394		0.50	262.9	3.0		25.9	269	4.2	291	2.0	0.0	2.0	1.1	180	
	5	7.90	85.0	353		0.32	327.9	1.2	1.8	30.7	233	1.4	248	4.8	0.0	1.4	0.9	157	
	6	7.20	29.0	237		0.44	217.1	3.6	4.3	3.5	188	6.4	205	3.2	0.0	0.2	1.6	112	
	7	7.80	71.0	315		0.44	293.5	1.2	1.8	27.5	212	3.1	238	10.8	0.0	0.8	0.6	133	
	8	7.38	35.0	158		0.19	57.1	0.9	1.8	2.4	145	0.8	149	1.6	0.0	0.0	1.0	78	
	9	7.72	64.0	267		0.32	263.1	1.5	3.0	26.4	190	0.6	190	12.0	0.2	0.6	1.3	120	
	10	7.90	84.0	275		0.88	510.6	1.2	3.0	18.4	196	5.1	204	18.8	2.6	6.4	0.7	129	
4/4/74	1	7.65	82.5	206	60.4	0.79	48.0	3.4		2.0	118	3.2	213	7.6	0.0	0.4	1.1	112	8.3
	2	7.35	90.5	454	79.4	0.33	77.9	1.6		23.2	281	2.9	379	0.4	0.0	0.2	1.5	209	515.2
	3	7.80	112.5	503	31.3	0.33	261.0	0.6		37.2	309	4.6	408	0.8	0.0	0.2	1.4	225	40.2
	4	7.95	106.5	378	74.4	0.20	176.7	0.3		26.0	243	1.7	309	4.0	0.0	1.4	1.1	176	31.8
	5	8.05	88.5	339	26.3	0.39	217.3	0.3		23.8	203	392.0	283	0.8	0.0	0.6	0.6	146	8.3
	6	7.45	30.5	242	26.3	0.13	146.2	0.9		3.7	158	0.1	234	7.2	0.0	0.4	0.7	105	
	7	7.85	74.0	306	50.3	0.52	193.4	0.9		26.6	185	2.5	266	13.2	0.0	0.6	1.2	136	
	8	7.45	36.5	161	61.7	0.59	65.6	1.2		2.0	101	1.4	161	2.0	0.0	0.0	0.8	75	
	9	7.80	67.0	257	50.3	0.13	173.3	0.9		25.4	175	0.2	218	17.6	3.2	0.0	0.9	107	
	10	7.95	87.0	260	31.3	0.52	368.8	0.6		17.6	167	392.0	214	10.0	0.0	7.0	1.0	110	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Iron µg/l
4/6/74	1	7.75	84.0	201	61.0	0.20	84.8	1.9	5.6		119	2.8	132	4.0	0.0	1.6	1.3		14.6
	2	7.10	92.0	417	78.5	0.07	83.6	1.9	19.2	23.2	280	5.2	287	0.4	0.0	0.0	0.9	211	409.1
	3	7.40	107.5	496	89.8	0.26	268.5	1.9	13.0	38.8	299	0.6	326	3.2	0.0	0.0	1.2	221	61.6
	4	7.95	105.0	352	62.0	0.46	201.7	2.8	6.8	25.4	248	0.4	170	2.0	0.0	1.8	0.3	170	48.2
	5	8.08	86.5	318	90.9	0.33	234.4	3.1	3.7	28.8	154	1.6	208	0.4	0.0	1.2	1.3	144	21.3
	6	7.18	36.0	219	50.7	0.07	163.7	2.2	5.0	3.1	153	0.8	162	5.2	0.0	0.0	0.7	103	
	7	7.85	67.5	287	84.7	0.33	217.4	2.5		31.6	147	0.7	178	7.2	0.0	0.6	1.5	132	7.9
	8	7.15	42.0	136	53.8	0.13	83.5	3.1		3.1	45	0.3	68	1.6	0.0	0.0	1.2	69	
	9	7.85	65.0	257	110.5	0.33	186.8	3.7		26.6	142	1.2	120	3.6	22.6	0.4	0.7	114	
	10	7.85	79.0	248	40.4	0.53	382.8	2.8	6.8	18.8	123	0.4	152	3.2	0.4	12.6	1.5	118	
4/9/74	1	7.30	81.0	213	46.2	1.06	63.6	3.4	3.1	4.2	144	1.6	155	8.0	0.0	0.0	1.2	118	
	2	7.00	75.0	467	51.3	1.19	103.4	1.5		38.8	370	8.5	352	0.8	0.0		1.1	201	
	3	7.20	103.0	510	60.6	0.92	278.0	1.2	10.4	45.5	355	2.6	346	10.8	0.0	0.0	0.7	225	
	4	7.80	103.0	364	29.7	0.92	197.7	0.6	6.1	22.7	248	2.9	249	4.4	0.0	2.6	0.8	170	
	5	7.50	84.0	340	27.6	0.59	227.3	0.6	1.2	29.4	225	1.0	191	6.0	0.0	0.4	1.7	144	
	6	7.00	30.0	226	40.0	0.07	174.2	1.2	3.1	2.0	167	0.4	156	8.4	0.0	0.0	0.8	108	
	7	7.60	72.0	304	35.9	0.79	199.9	1.2	3.7	32.1	192	1.2	176	30.4	0.0	0.4	0.6	128	
	8	7.10	36.0	154	30.7		73.2	0.9	2.4	3.7	100	0.9	94	3.6	0.2	0.0	1.7	77	
	9	7.60	66.0	262	26.6	0.07	187.0	0.6	10.4	27.7	134	2.4	146	33.2	0.8	0.2	0.8	110	
	10	7.50	65.0	258	27.6	0.13	191.5	1.8	13.5	23.8	157	8.7	176		9.0	5.6	0.6	110	
4/16/74	1		82.0	213	270.6	1.20	32.6	6.1	11.2	2.9	146	0.6	112	7.2	0.0	0.6		107	
	2		111.0	451	92.8	1.53	45.1	4.9	24.2	17.9	297	6.4	293	5.2	0.0	0.0	1.6	207	
	3		95.0	466	70.0	2.53	344.3	3.4	12.4	38.1	294	6.2	293	7.6	0.0	0.4	1.1	211	
	4		100.0	352	36.5	0.93	182.6	3.4	28.6	21.0	224	4.7	220	5.2	0.0	1.8	0.8	171	
	5		86.0	335	33.3	0.80	227.9	1.8	10.6	28.3	200	2.5	228	3.2	0.0	0.0	1.0	147	
	6		32.0	255	36.5	0.40	193.1	3.4	6.2	2.9	167	0.4	136	5.6	0.0	0.4	0.2	102	
	7		75.0	307	39.6	0.80	209.0	2.8	5.0	26.2	197	7.5	154	14.8	0.0	0.6	0.5	130	
	8		38.0	156	39.6	0.40	146.9	2.4	3.7	3.4	116	0.5		2.0	0.0	0.2	0.9	76	
	9		71.0	269	30.8	0.93	225.4	1.8	4.3	30.3	148	1.0	80	23.6	0.0	0.2	0.5	109	
	10		68.0	266	33.3	0.87	223.9	1.5		23.1	125	1.4	107	22.8	0.0	0.6	0.7	109	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Iron µg/l
4/18/74	1	7.45	74.5	206	46.8	0.69	112.7	2.2		4.4			101	0.4	0.2	1.4	1.4	66	16.7
	2	7.78	105.5	570	66.0	4.44	173.7	15.0		51.6		3.3	329	6.0	0.2	3.4	2.2	154	67.3
	3	7.55	88.0	491	195.5	1.19	353.5	2.9		45.9		5.9	283	0.4	0.0	5.0	0.8	196	130.0
	4	8.10	97.0	373	51.2	1.19	294.4	1.9		26.2		2.4	209	0.0	0.0	5.0	0.8	163	54.0
	5																		
	6																		
	7																		
	8																		
	9	7.95	64.5	293	40.7	0.94	269.6	2.9		36.6		2.0	145	1.2	0.2	0.8	0.6	107	16.0
	10																		
4/20/74	1	7.40	79.0	205	50.8	0.50		1.7	9.5	3.4	70	0.7	71	0.4	0.0	0.8	1.3		
	2	7.30	77.0	890	60.9	4.96		0.7	75.1	14.3	432	11.7	493	0.4	0.0	0.0	1.8		
	3	7.30	94.5	534	28.9	1.61		0.7	20.8	53.7	294	3.8	314	0.0	0.0	2.8	0.9		
	4	7.80	96.0	472	91.1	2.35		1.3	53.6	44.9	166	30.6	175	4.4	0.0	1.4			
	5																		
	6																		
	7																		
	8																		
	9	7.48	65.5	297	28.9	0.62		1.3	15.8	36.6		13.3	105	0.0	0.0	2.2			
	10																		
4/23/74	1	7.53	75.0	189		1.39	173.5	4.1	4.4	4.5	185	3.0				3.4	1.6	95	33.6
	2	7.85	116.0	573		3.76	198.2	12.6	27.1	60.5	436	6.2				1.6	1.9	199	61.8
	3	7.65	101.0	540		2.55	458.8	2.5	20.8	59.2	410	6.1				0.6	1.4	173	157.2
	4	7.95	99.0	368		1.21	341.7	2.8	115.5	54.2	275	94.0				4.4	1.4	162	535.5
	5	8.05	86.0	351		0.81	405.7	1.9	11.4	33.2	274	6.7				0.8	1.8	145	48.7
	6	7.25	30.0	213		0.52	271.4	4.1	6.3	5.0	164	3.1				0.0	1.0	92	7.9
	7	7.80	74.0	312		0.81	373.7	2.5	5.7	31.1	199	4.2				1.0	0.6	123	35.5
	8	6.85	36.0	156		0.58	272.9	1.9	10.7	3.9	152	1.7				0.8	0.2	71	4.6
	9	7.70	67.0	277		0.52	292.2	2.5	14.5	33.2	173	5.5				0.8	1.4	100	19.1
	10	7.80	68.0	262		0.69	157.2	1.3	7.6	26.8	146	8.5				1.0	1.4	107	17.8

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
4/25/74	1	7.25	59.0	157	75.6	0.95	324.3	2.9		6.8	108	4.1	26		0.0	9.0	0.6	69
	2	7.75	102.0	706	81.3	4.23	215.3	5.5		65.8	353	12.2	296		0.8	28.4	2.3	176
	3	7.55	96.5	537	100.9	1.58	541.9	1.6		59.2	344	11.2	295		0.0	11.2	0.7	195
	4	7.90	87.0	386	74.4	0.69	436.1	1.9		34.2	270	178.3	259		0.4	2.8	1.8	152
	5																	
	6																	
	7																	
	8																	
	9	7.78	60.0	264	74.4	0.44	365.4	0.6		27.9	182	27.7	121		0.4	0.4	0.6	102
	10																	
4/27/74	1	7.39	52.5	141		0.45	166.2	2.1	43.0	9.6		3.7	87	7.2	0.0	0.6		116
	2	7.90	101.5	405		1.59	292.3	2.7	15.8	39.0	201	6.7	242	1.2	0.0	1.4		232
	3	7.70	95.0	445		1.02	442.0	1.8	30.4	29.6	229	9.3	288	4.8	0.0	2.2		195
	4	8.00	92.0	409		0.51	522.0	0.6	8.2	37.9		11.9	117	4.4	0.0	5.8		168
	5	7.95	76.0	352		0.45	601.2	1.5	6.3		145	10.2	101	2.8	2.2	0.6		139
	6	7.40	26.5	185		0.06	486.8	1.8	7.0	5.5	67	2.2	125	11.6	0.0	0.0		72
	7	7.90	65.5	311		0.38	506.5	2.1	12.7	27.5	136	9.6	178	2.0	0.4	2.2		130
	8																	
	9	7.90	59.0	259		0.45	362.8	2.7	8.2	30.6	44	8.8	149	11.2	0.4	2.0		108
	10	7.90	58.0	256		0.32	316.8	1.5	5.7	26.4	62	14.7	162	4.4	0.0	5.8		105
4/30/74	1			140	50.1	1.26	90.9	2.4	4.7	2.9	237	0.6	177	0.0	0.0	0.8	1.1	69
	2			315	51.5	1.69	149.1	3.7	15.5	11.8	350	9.3	318	2.8	0.2		0.7	161
	3			389	64.8	0.98	337.8		12.2	30.6	358	4.7	329	0.4	0.0		0.9	158
	4			377	47.5	0.84	458.5	1.0	14.2	31.7	361	8.5	311	0.0	0.0	0.6	0.2	162
	5			333	58.1	0.56	468.8	0.3	8.8	39.0	320	5.3	266	0.0	0.2	0.2	0.2	136
	6			178	63.5	0.35	328.4	1.0	10.1	4.5	193	0.3	186	1.6	0.0	0.4	1.7	88
	7			301	79.5	0.77	431.9	0.7	8.8	35.9	257	2.5	239	0.8	0.0	0.4	0.2	121
	8			136	103.5	0.28	182.7	2.7	4.7	3.5	157	0.4	144	0.0	0.0	0.0	0.5	63
	9			266	67.5	1.62	327.2	0.7	7.4	31.7	227	2.7	219	0.0	0.0	0.2	0.3	89
	10			267	151.5	0.63	325.9	0.7	7.4	29.6	217	3.1	215	0.8	0.0	0.4	0.2	103

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
5/2/74	1	7.25	50.5	129		0.45	231.5	0.9			83	4.2		28.4	0.0	1.2	1.3	55
	2	7.60	81.5	250		0.64	110.5	2.5			153	7.1		0.8	1.2	3.6	1.5	97
	3	7.48	84.5	326		0.58	154.0	1.9		23.5	170	16.4		1.2	0.2	1.6	1.7	150
	4	7.92	85.0	321		0.51	231.4	0.9		29.0	179	21.4		0.0	0.0	2.0	1.4	149
	5																	
	6																	
	7																	
	8																	
	9	7.85	55.0	257		1.48	225.6	1.9		28.5	143	6.8		22.4	0.0	0.8	1.3	98
	10																	
5/4/74	1	7.20	42.0	109		0.51	44.8	0.3	2.5	3.5	41	7.9	162	13.2	0.0	1.6	2.2	59
	2	7.70	81.0	221		0.95	128.3	1.3	4.4	7.0	134	21.3	233	2.8	3.0	7.2	1.4	114
	3	7.75	92.5	333		0.76	261.5	0.3	3.8	22.4	203	14.2	314	10.0	0.0	2.8	1.3	148
	4	7.90	84.0	352		0.76	133.7		2.5	27.8	187	25.7	265	6.4	0.0	2.8	0.9	152
	5	7.95	68.5	320		0.76	228.0	0.3	5.0	37.8	166	18.8	251	8.0	0.0	1.2	1.4	112
	6	7.45	25.5	158		0.57	121.7	1.7	4.4	4.0	69	0.8	163	8.4	6.6	3.4	1.1	71
	7	7.90	60.5	295		0.95	215.8	0.7	1.9	33.3	125	14.3	166	2.8	0.4	1.0	1.1	103
	8																	
	9	7.90	56.5	256		0.76		0.7	1.3	28.3	102	5.8	201	1.2	0.0	2.2	2.2	97
	10	7.90	57.0	257		0.76		0.3	2.5	28.3	94	8.6	190	1.6	0.4	2.6	0.8	95
5/7/74	1	7.10	37.5	96	71.2	0.69	26.8	1.9	5.0	2.4	42	5.5	19	5.6	0.0	11.0	1.3	25
	2	7.50	72.5	202	46.2	0.50		1.9			143	26.6	65	8.0	11.0	4.2	0.6	
	3	7.70	80.0	297	61.8	0.63	213.7	1.0	2.5	26.5	169	51.5	197	0.8	6.2	3.2	1.2	119
	4	7.75	74.0	334	52.4	0.88	367.3	1.0	3.8	26.5	171	55.1	177	1.2	1.6	1.3		135
	5	7.80	60.0	324	50.9	0.69	422.4	1.0	4.4	36.9	162	28.4	105	2.0	0.4	2.2	1.4	117
	6																	
	7	7.75	53.0	302	54.0	0.69		1.0			152	32.7	105	2.4	0.4	2.3	0.8	
	8																	
	9	7.80	47.0	236	47.7	0.69	197.1	1.0	2.5	25.4	46	18.3	94	9.6	0.0	2.2	0.7	83
	10	7.80	48.0	242	57.1	0.69	268.6	1.0	3.8	24.4	316	21.8	80	3.2	1.2	3.6	1.3	90

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Iron µg/l
5/9/74	1	7.20	33.5	86	20.3	0.45	56.1	1.3	6.9	2.8	107	2.0	138	99.2	0.2	4.2	0.4	35	
	2	7.75	75.0	208	17.1	0.76	235.6	1.3	4.4	4.4	177	40.8	221	15.6	5.3	0.4	0.6	91	
	3	7.80	77.0	257	19.5	0.76	436.8	1.3	3.2	20.1	154	43.8	198	3.2	4.7	4.4	0.2	106	
	4	7.95	74.0	277	20.3	0.45	309.1	0.3	3.8	19.6	251	85.6	216		0.7	2.2	0.8	112	
	5																		
	6																		
	7																		
	8																		
	9	7.80	45.0	201	4.3	0.45	305.6	1.3	3.8	22.7	131	29.3	134	1.2	0.0	1.4	0.7		
	10																		
5/14/74	1	7.50	31.0	75	66.5	0.74	377.0	2.6		2.8		3.2	107	0.0	0.0	1.6	4.3	62	18.2
	2	7.90	101.0	235	46.7	0.99	318.2	1.9		4.9		2.2	214	2.8	2.4	0.4	3.1	159	102.4
	3	8.00	102.0	265	21.9	0.56	350.5	1.0		11.5		14.5	196	2.4	1.0	1.4	2.3	135	138.2
	4	8.00	95.0	274	45.0	0.43	382.6	0.6		13.1		13.8	219	2.0	0.4	1.2	4.0	120	245.3
	5	8.00	72.0	245	21.9	0.37	467.7	1.0		21.3		9.6	180	2.4	0.0	0.6	3.2	104	156.5
	6																		
	7	7.95	62.0	220	27.6	0.56	456.9	1.9		19.2		8.4	172	2.8	0.0	0.2	2.8	89	125.9
	8																		
	9	7.85	54.0	199	21.9	0.50	302.7	1.0		17.7		9.3	116	4.0	0.0	0.8	2.8	85	78.2
	10	7.85	54.0	203	22.7	0.43	228.3	1.6		15.6		5.7	144	2.4	0.2	1.6	3.2	81	69.4
5/16/74	1	7.65	31.0	70	35.8	6.07	574.0	1.3		2.5	28	4.7		8.4	0.0		1.1	35	15.9
	2	7.90	94.0	209	62.3	0.31	361.4	0.6		5.5	95	6.5		8.0	0.8		0.9	104	146.4
	3	8.05	104.0	236	29.6	0.31	372.0	1.3		11.0	116	9.7		4.0	0.4			116	189.1
	4	8.10	82.0	251	25.2	0.31	302.9	0.9		11.5	144	11.8		1.6	0.0		0.5	120	294.9
	5	7.95	70.0	222	24.3	0.31	297.6	1.3		15.1	132	11.8		5.6	0.4		0.8	101	191.3
	6																		
	7	7.90	59.0	198	16.3	0.25	260.4	0.6		9.0	115	10.4		2.0	0.0		0.9	81	142.0
	8																		
	9	7.95	52.0	183	25.2	0.19	207.3	1.3			118	6.2		5.6	0.6		0.7		88.4
	10	7.90	53.0	185	26.9	0.25		0.9		14.1	88	8.2		8.4	0.4		0.4	70	79.0

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
5/18/74	1	7.85	27.5	62	127.7	1.30		2.8		2.4	106	2.4		12.4	0.0		2.5	
	2	7.90	94.0	188	32.6	0.87		1.6		4.4	178	9.4		6.0	0.4		1.1	
	3	8.05	99.5	217	32.6	0.74		1.9		7.8	200	11.5		6.8	1.2		1.9	
	4	7.95	88.0	221	65.9	0.68		1.3		9.2	180	15.1		4.0	0.0		1.6	
	5	8.05	69.0	196	47.3	0.87		1.6		11.7	178	10.5		7.2	0.0		2.1	
	6																	
	7	7.95	58.5	175	49.3	0.87		1.6		10.7	155	10.8		3.2	0.0		1.1	
	8																	
	9	7.85	50.5	164	37.5	0.68		1.6		12.1	154	6.4		2.8	0.2		1.5	
	10	7.85	52.5	166	30.6	0.68		1.6		12.6	150	8.3		0.8	0.2		1.7	
5/21/74	1	7.45	40.0	120	64.2	0.78	12.2	4.8	29.9	1.8	37	3.4	18	9.6	0.0	4.6	0.3	
	2	7.90	108.0	263	29.3	0.19	194.4	1.3	15.3	6.6	24	4.6	16	10.0	0.4	6.0	1.6	
	3	8.04	109.0	286	17.1	0.13	428.4	1.9	21.0	9.2	35	14.0	118	6.0	0.2	2.6	1.0	
	4	8.00	102.5	307	23.7	0.39	214.8	1.6	20.4	10.3	64	7.5	109	6.4	0.2	3.4	0.5	
	5																	
	6																	
	7																	
	8																	
	9	7.70	56.0	213	18.0	0.26	142.2	1.6	36.9	14.5	11	8.5	61	10.8	0.2	2.2	0.5	
	10																	
5/25/74	1	7.30	30.0	62	57.2	0.58	94.7	5.2		1.8		3.5	259	2.8	0.2	0.8	0.4	
	2	7.70	86.0	205	75.9	0.14	337.7	1.6		4.5		7.4	246	6.8	0.2	1.8		
	3	7.90	97.0	216	43.0	0.14	403.0	2.0		7.6		10.3	286	2.8	0.0	2.0	0.0	
	4	7.90	110.0	237	70.6	0.36	505.9	2.0		8.2		13.3	334	4.0	0.2	1.8	0.1	
	5	7.80	85.0	197	87.1	0.14	549.9	1.6		9.7		8.4	244	2.4	0.0	1.8	0.4	
	6																	
	7	8.10	85.0	176	34.8	0.29	542.8	1.2		9.2		9.3	275	2.0	0.0	2.2		
	8																	
	9	7.80	44.0	169	27.4	0.29	435.1	1.2		11.8		5.3	174	8.0	0.6		0.4	
	10	7.80	51.0	169	34.1	0.36	452.4	1.2		11.8		5.1	188	10.0	0.4	8.4	0.3	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
5/28/74	1	7.50	37.0	75	48.2	0.66	56.2	2.8	11.4	1.0	9	9.6	13	18.4	0.4	1.4	0.5	43
	2	7.75	75.0	180	34.9	0.86	116.6	8.8	16.1	7.3	105	65.0	89	8.0	0.2	1.0	0.5	76
	3	7.85	75.0	199	29.9	0.79	173.5	4.0	9.4	2.1	70	35.8	95	9.6	0.6	2.8	0.4	96
	4	7.90	74.0	180	39.9	0.46	310.2	1.2	7.4	5.2	80	55.6	76	2.8	0.8	1.5	0.3	88
	5	7.80	57.0	149	41.5	0.86	321.2	2.8	10.1	5.2	102	87.6	74	1.6	0.8	1.4	0.4	72
	6																	
	7	7.75	41.0	134	41.5	0.46	306.4	3.6	6.7	5.2	59	36.7	86	0.0	0.5	0.3	0.2	65
	8																	
	9	7.80	49.0	124	36.5	0.92	237.8	3.6	7.4	8.4	75	47.5	46	0.4	0.5	3.3	0.9	56
	10	7.65	41.0	121	33.2	0.73	279.6	2.4	6.0	7.3	66	44.4	65	1.2	2.5	0.5	0.4	54
5/30/74	1	7.80	40.0	88	44.9	0.78	189.7	10.2		1.3	31	10.7	44	26.0	0.0	0.4	1.0	42
	2	8.00	85.0	175	37.5	0.78	645.4	4.2	11.6	2.9	88	23.7	105	17.6	0.0	2.0	0.5	84
	3	8.12	86.0	189	37.5	0.58	636.9	3.4	11.6	6.1	83	17.9	109		0.4	3.4	0.9	91
	4	8.10	82.0	193	26.5	0.45	304.6	3.0	10.9	5.5	70	21.8	134	2.0	0.0	1.2	0.7	89
	5	8.05	65.0	161	24.7	0.52	251.4	2.6	10.2	6.1	37	23.6	102	20.0	0.0	1.0	0.4	71
	6																	
	7	8.05	55.0	148	33.9	0.45		3.8		5.5	82	27.6	89	22.8	0.0	1.2	0.5	62
	8																	
	9	7.90	45.0	131	33.9	0.32	249.7	4.2	9.5	7.1	55	25.8	93	22.0	0.0	1.0	0.7	55
	10	7.95	47.0	132	17.3	0.45	150.1	3.0	10.9	8.2	49	28.9	95		0.0	1.6	0.8	53
6/1/74	1	7.85	42.0	94		1.40	71.5		12.9	1.5	21	5.5	72	17.6	0.0	1.4		42
	2	8.00	85.0	199		0.59	185.7		18.4	2.4	32	16.6	109	0.4	0.0	2.8		84
	3	8.10	84.0	209		0.59	210.0		8.8	3.9	32	13.8	77	2.4	0.0	2.0		85
	4	8.10	86.0	214		0.66	254.4		6.8	4.9	28	22.1	76	7.6	0.0	1.4		91
	5	8.05	65.0	163		0.59					70	18.4	55	2.0	0.6	1.0		
	6																	
	7	8.00	55.0	148		0.66	242.3		11.6	4.9	14	15.3	33	5.6	0.0	0.4		62
	8																	
	9	7.80	43.0	143		0.74	165.3		8.8	6.3	6	15.4	60	12.0	0.4	1.2		55
	10	7.85	46.0	148		0.66	145.1		12.2	6.3	45	17.4	79	9.6	0.4			56

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
6/4/74	1			94			26.7		11.6	2.4	11	5.9	33	14.0	0.0			60
	2			193			164.1		10.9	2.4	49	8.3	106	17.2	0.0			78
	3			201			183.2		29.9	4.4	172	12.8	86	2.0	0.4			85
	4			198			232.8		10.2	5.4	71	16.5	116	2.0	0.4			89
	5			204			213.7		12.9	4.9	91	6.6	89	6.0	0.0			69
	6																	
	7			155			171.8		11.6	4.4	46	11.1	82	6.4	0.4			60
	8																	
	9			124			167.9		12.2	5.4	39	11.8	68	2.0	0.4			53
	10			129			118.3		8.2	6.3	27	15.4	66	4.8	0.6			51
6/8/74	1	7.90	72.0	120		0.71	169.9		6.8	1.5	65	4.5	196	15.2	0.0	0.2	0.9	80
	2	7.70	89.0	185		0.41	189.5		3.4	3.0	123	42.1	229	0.0	0.0	0.0	0.8	100
	3	8.05	97.0	184		0.41	236.0				123	4.9	216	2.0	0.0	0.0	0.6	
	4	7.95	92.0	187		0.35	236.1		6.1	4.5	149	6.7	204	10.0	0.4	0.8	0.8	100
	5	7.90	71.0	156		0.71	212.5		4.1	5.1	109	6.9	146	12.8	4.8	1.0	0.8	88
	6																	
	7	7.98	63.0	196		0.47	208.9		10.2	4.5	79	6.2	126	1.6	1.2	0.0	0.8	73
	8																	
	9	7.80	43.0	130		0.24	166.4		6.8	7.1	92	6.9	99	11.6	0.8	1.0	0.9	73
	10	7.75	51.0	131		0.71	228.0		6.1	7.1	93	6.1	83	18.0	1.2	0.6		77
6/11/74	1	7.65	43.0	86		1.37	45.6		17.7	2.3	98	5.5	127	4.4	0.4	1.4	0.5	57
	2	7.68	92.0	180		0.55	145.0		6.8	2.8	133	3.6	175	0.0	0.0	1.2	0.2	84
	3	7.80	87.0	192		0.62	149.6		7.5	3.8	138	5.5	179	7.6	0.0	0.2	0.1	100
	4	7.81	81.0	199		0.34	192.2		7.5	4.7	147	4.0	185	4.4	0.2	1.2	0.2	103
	5	7.65	71.0	167		0.34	187.5		6.8	4.7	144	3.0	162	3.6	0.4	0.4	0.3	80
	6																	
	7	7.65	56.0	161		0.07	154.9		6.8	7.8	120	2.7	141	4.8	0.2	0.6	0.0	73
	8																	
	9	7.54	54.0	143		0.21	150.0		8.2	3.8	108	3.5	149	12.4	0.0	2.6	0.5	65
	10	7.60	49.0	147		0.27	131.2		9.5	7.3	88	2.0	132	13.6	0.4	1.4		69

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
6/15/74	1	8.10		119		0.29					38	47.0			1.0	3.0	0.5	54
	2	8.25		149		0.15					61	28.5	99	0.8	2.2	1.0	0.1	77
	3	7.95		155		0.22					67	37.7	120	0.4	1.2	2.8	0.3	88
	4																	
	5																	
	6																	
	7	7.80		111		0.22					43	71.3	94		2.4	2.2	0.4	65
	8																	
	9	7.65		96		0.36					34	75.6	81	0.4	3.0	1.3	0.6	57
	10																	
6/18/74	1	7.04	23.2	53		0.62						4.0	109	6.0	0.8	0.2		
	2	7.92	80.4	186		0.49	208.0					8.3	174		0.4	1.4		
	3	8.02	80.6	192		0.42	218.7					8.4	180		0.2	1.6		
	4	8.01	83.8	194		0.21	226.0					6.1	156	1.6	0.4	0.2		
	5	7.92	67.2	163		0.28	271.8					7.8	131	3.6	0.6	3.0		
	6																	
	7	7.94	53.8	148		1.18	119.9					7.2	137	5.6	0.0	1.2		
	8																	
	9	7.89	40.4	121		0.14	218.9					5.5	204	2.8	0.6	1.4		
	10	7.72	40.8	124		0.35	241.7					7.0	195	6.4	0.4	0.6		
6/22/74	1	8.10	72.0	165		0.37	50.8	2.5	12.8	3.4	124	4.7	123	18.8	0.0	0.4	0.3	71
	2	7.90	81.0	178		0.37	76.3	4.7	12.2	5.9	129	3.3	124	10.8	0.4	0.4	0.2	89
	3	8.00	83.0	197		0.43	82.7	1.9	18.2	7.9	185	3.0	141	2.8	0.0		0.6	87
	4	8.00	80.0	192		0.55	79.3	2.2	6.8	5.4	117	6.8	140	2.4	0.2	3.8	0.8	89
	5	7.90	66.0	182		0.43	69.9	4.1	6.1	5.9	126	19.0	129	1.6	0.2	1.4	1.0	73
	6																	
	7																	
	8																	
	9	7.90	43.0	138		0.43	50.7	2.8	6.8	7.4	72		100	4.8	0.2	1.6	0.7	55
	10																	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Iron µg/l
6/25/74	1	7.80	69.0	143			66.2	3.7	18.9	2.2	178	6.0	87	0.0	0.8	3.0		66	
	2	7.70	82.0	189			128.0	3.7	16.9	2.7	193	7.0	120	12.4	0.8	2.4		88	
	3	7.80	82.0	198		0.06	103.4	2.7	11.5	5.1	190	5.0	122	5.2	0.8	2.4		88	
	4	7.70	82.0	205		0.13	113.8	2.7	14.2	6.2	172	4.8	126	18.8	0.6	2.8		96	
	5	7.80	65.0	126		0.26	120.9	3.0	8.8	5.1	159	5.8	113	15.2				77	
	6																		
	7	7.60	54.0	124		0.13	115.3	4.7	10.1	4.6	128	5.6	112	24.8	1.6	4.4		65	
	8																		
	9	7.50	50.0	121		0.64	106.0	3.7	14.9	6.6	109	4.4	78	30.4	1.6	16.2		56	
	10	7.50	41.0	125		0.19	131.3	3.4	12.8	7.3	97	5.3	82	35.6	2.0	8.0		56	
6/29/74	1	8.20	81.0	169		0.91	121.0	6.5		1.0	86	5.1	103	17.2	0.0		0.7	83	32.6
	2	8.20	99.0	201		0.12	75.5	1.7		2.6	115	3.0	119	7.6	0.4		0.6	97	75.8
	3	8.30	92.0	211		0.18	109.1			3.8	114	4.0	137	1.2	0.0		0.0	118	168.2
	4	8.20	92.0	231		0.30	104.8			4.1	121	5.9	138	7.2	0.0		0.0	118	145.5
	5	8.20	76.0	191		0.30	104.8	4.5		4.2	107	6.5	117	1.6	0.2		0.2	93	127.3
	6	7.60	23.0	96		0.43	83.6	1.4		1.5				13.6	0.0			54	1.5
	7	8.10	55.0	167		0.37	104.7	1.4		4.0	97	4.4	107	19.2	1.4		0.6	90	70.5
	8																		
	9	8.00	52.0	127		0.49	87.8	0.6		5.6	89	3.7	90	15.2	0.0		0.8	75	37.1
	10	7.90	52.0	138		0.55	108.7	0.8		6.6	87	3.2	79	14.4	0.6		0.5	64	43.9
7/2/74	1	8.20	80.0	180	117.4	0.69	112.1	6.0	9.0	3.7	128	3.7	96		8.8	14.0	0.7	103	
	2	8.10	101.0	241	97.4	0.12	80.7		5.8	1.6	143	2.9	124	35.5	3.2	14.8	0.8	120	
	3	8.10	129.0	241	74.5	0.52	143.2	19.8	43.6	3.2	153	7.2	153	17.5	1.2	5.2	0.8	119	
	4	8.10	91.0	251	96.4	0.69	80.2	1.8	9.0	3.7	152	8.5	180	36.0	4.4	5.6	0.5	147	
	5	8.00	77.0	214	72.6	0.17	145.3	1.2	5.8	4.8	135	3.5	109	32.0	4.0	5.6	0.6	112	
	6																		
	7	8.00	71.0	193	91.7	0.23	57.0	2.1	5.1	3.2	23	3.7	103	22.8	2.0	8.8	1.1	97	
	8																		
	9	7.90	43.0	157	69.8	0.40	166.9	2.1	9.0	5.3	94	2.8	137		1.6	17.6	1.3	70	
	10	8.00	48.0	164	94.5	1.56	142.2	1.2	7.7	4.8	88	2.1	142		2.4	16.0	0.3	80	

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
7/6/74	1	8.30	92.0	190	27.5	0.28	83.1	2.2	8.3	0.5	94	5.7	97	6.8	0.0	3.2		116
	2	8.20	108.0	241	44.3	0.23	158.1	1.6	4.5	1.5	144	2.6	118	4.0	1.4	3.6	0.3	122
	3	8.30	103.0	261	47.8	0.46	132.9	1.9	5.1	5.5	143	2.2	125	0.0	0.0	1.8	0.0	134
	4	8.20	107.0	278	60.2	0.17		1.6			146	2.7	139	0.0	0.2	2.4	0.0	
	5	8.20	82.0	227	24.8	0.28	149.7	1.6		3.5	138	2.6	104	0.8	2.6	2.2	0.3	119
	6																	
	7	8.00	70.0	196	39.9	0.46	132.9		4.5	5.0	122	1.2	93	0.8	0.0	4.8	0.4	103
	8																	
	9	7.90	49.0	160	39.9	0.28	145.3	1.9	4.5	4.5	92	1.6	85	3.2	0.0	4.0	0.5	82
	10	7.90	48.0	170	40.8	0.28	170.4	3.2	3.8	4.5	85	2.1	113	48.8	16.0			108
7/9/74	1		84.0	177		0.30	113.1	2.6	3.9	1.2	75	5.2	50	36.7	4.4			129
	2		89.0	241	14.1	0.42	124.6	2.3	6.5	2.9	156	0.9	133	40.0	1.6		0.4	136
	3		106.0	246	58.4	0.30	146.7	2.0	3.3	4.0	138	2.2	126	7.0	0.4		1.0	125
	4		91.0	262	25.4	0.53	99.1	2.0	2.0	4.9	123	0.3	162	17.0	0.0		0.4	133
	5		70.0	218	32.3	0.36	109.0	2.0	2.6	4.9	99	1.4	48	20.0	0.0		0.6	125
	6																	
	7		60.0	187	8.0	0.30	78.7	2.0	4.6	4.3	99	2.5	102	18.8	0.8		0.3	148
	8																	
	9		59.0	149	17.6	0.47	132.2	1.6	3.3	6.6	62	0.8	89	37.2	0.0		0.8	136
	10		40.0	154	19.3	0.42	113.0	2.6		7.1	67	11.8	21	46.0	2.8		0.2	121
7/16/74	1	8.52	101.0	190		0.75	46.6	4.5	12.3	3.1	140	3.0	134	6.0	10.4	14.0	0.7	109
	2																	
	3																	
	4	8.11	111.0	290		0.25	94.4	4.5	5.2	5.6	183	24.7	198	20.0		17.2	1.0	129
	5	8.18	96.0	237		0.19	94.5	1.0	6.5	4.6	164	6.3	142	19.0	2.8	10.0	1.0	113
	6																	
	7	8.10	66.0	221		0.31	73.9	0.3	5.8	5.1	131	2.3	131	5.2	20.8		1.3	94
	8																	
	9	7.80	51.0	171		0.75	38.6	0.6	17.4	5.1		0.7	101	10.0	0.8	14.0	1.3	74
	10	7.92	60.0	177		1.75	98.9	1.9	5.8	9.7	126	1.1	102	54.0	1.6	10.8	1.9	78

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l
7/20/74	1	8.60	108.0	206	120.0	0.29	14.9		2.7	2.0	118		183	0.0	3.7	0.0	0.2	97
	2	8.00	109.0	290	53.3	0.24	83.1		5.3	2.5	148	16.6	251	0.0	0.0	13.6	0.8	136
	3	8.50	121.0	275	55.7	0.41	59.1		15.9	3.8	175	5.1	238	0.0	0.5	3.6	0.3	129
	4	8.40	119.0	296	51.8	0.29	108.3		8.6	4.8	166	2.2	240	0.0	0.5	5.6	0.4	129
	5	8.30	95.0	242	37.8	0.29	302.8		9.3	5.7	136	2.6	211	2.0	1.7	16.8	0.2	97
	6																	
	7	8.30	77.0	211	44.0	0.12	102.6		5.3	4.3	82	2.2	213	5.6	0.4	6.8	0.4	90
	8																	
	9	8.10	59.0	173	42.5	0.35	113.3		9.3	5.7	80	1.3	170	6.5	0.3	2.4	0.9	74
	10	8.20	61.0	179	116.1	0.41	167.2		9.3	7.0	98	2.1	182	13.0		21.6	0.5	74
7/23/74	1	8.30	107.0	211	69.8	1.00	45.4	5.6	27.9	5.3	92	7.0	116	2.8	11.0	18.3	0.9	93
	2	8.11	133.0	284	33.6	0.29	92.9	4.0	19.3	3.2	132	57.9	248	0.0	0.8	0.8	0.5	136
	3	8.24	120.0	345	50.0	0.59	97.6	1.3	4.7	4.4	153	11.7	221	0.4	0.8	3.2	0.4	163
	4	8.06	122.0	297	33.6	0.35	111.1	1.3	43.9	4.9	139	5.9	178	0.0	0.4	3.2	0.4	106
	5	8.11	96.0	252	31.0	0.47	125.2	1.0		5.3	131	6.9	186	0.0	3.0	8.4	0.5	123
	6	7.61	23.0	132			104.8	1.3		1.5	52	1.0	104					93
	7	8.09	76.0	220		0.41	119.5	1.3	11.3	4.0	107	3.1	150	0.0	3.3	8.0	0.7	96
	8	7.70	29.0	92	25.0	0.29	29.5	2.3	17.9	0.6	33	2.0	85	5.3	0.0	8.8	0.6	50
	9	8.02	61.0	179	35.3	0.71	122.8	2.7	18.6	5.3	66	1.9	121	5.5	0.6	10.0	0.8	100
	10	7.95	61.0	185	43.1	0.71	138.3	1.3		7.0	90	1.8	115	4.0	1.7	13.6		80
7/27/74	1	8.20	95.0	214	65.4					0.3	116	2.6	128	8.8	8.0	38.0	1.3	113
	2	8.10	107.0	289	37.9					3.4	178	5.0	156	0.8	0.0	10.4	0.5	149
	3	8.40	106.0	263	34.4					3.9	178	2.7	191	0.0	0.0	1.6	0.8	149
	4	8.30	105.0	297	53.4					4.5	176	1.6	191	1.6	0.0	10.0	0.9	141
	5	8.20	85.0	253	59.0				7.1	5.5	156	13.0	177	2.8	2.0	28.0	2.1	121
	6	7.70	21.0	138	38.6				1.9	0.8	94	1.0	106	9.2	6.0	34.4	1.1	57
	7	8.30	69.0	191	36.5				7.8	4.5	147	1.5	142	2.8	1.3	24.8	1.1	97
	8	7.80	27.0	90	41.4				3.2	1.3	76	1.0	72	4.0	1.2	21.2	0.4	40
	9	8.10	54.0	186	65.4				3.2	6.1	103	0.7	109	3.5	0.4	83.2	0.6	77
	10	8.10	56.0	285	38.6				1.9	8.7	108			6.0	0.3	25.6	0.6	85

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	$SO_4^=$ mg/l
7/30/74	1			282	39.4	0.78	152.0		24.0	3.7	39	2.9	74	14.4	13.6	61.2	0.6	114	
	2			295	22.3		28.1		3.9	4.2	131	2.6	128	20.3	5.3	40.3	0.7	145	
	3			297	22.3		36.4			4.8	142	3.4	200	7.7	2.0	18.7	0.7	141	
	4			221	32.6		50.5		28.6	6.7	145	3.7	152	2.7	4.7	5.7	1.0	141	
	5			252	30.5	0.39	53.3		5.2	5.9	104	3.2	111		9.0	36.0	0.8	114	
	6			154	20.2	0.32	65.1		7.1	1.9	36	1.7	49	30.7	1.3	34.8	0.3	71	
	7			228	30.5	0.32	37.5		3.9	5.6	93	2.6	95	16.7	8.0	29.6	1.0	98	
	8			101	33.9	0.26			4.5	1.7	3	2.9	53	17.7	4.3	37.6	0.6	47	
	9			188	34.6	0.52	105.0		2.6	7.4	71	2.6	48	22.7	2.0	32.5	0.9	71	
	10			199	99.0	0.65	76.6			11.8	65	2.8	33	32.3	8.8	37.6	0.8		
8/3/74	1	8.60	99.0	231	31.9	0.39	50.2	4.7	9.0	1.3	55	0.3	120	1.2	1.2	53.3	0.0	123	
	2	8.20	112.0	300	29.4	0.13	94.3	4.0	14.6	3.5	122	0.6	163	1.3	0.3	26.7	0.7	154	
	3	8.40	107.0	292	24.2	0.06	73.9	3.4	12.4	4.8	123	0.3	186	0.0	0.0	4.0	0.1	158	
	4	8.30	106.0	307	36.2	0.90	94.2	3.7	21.3	6.3	133	0.1	165	0.8	0.0	4.0	0.8	154	
	5	8.30	90.0	265	32.8	0.06	80.6	3.0	16.3	6.1	103	2.3	166	0.4	0.3	15.3	0.6	127	
	6	7.40	22.0	155	30.2	0.26	76.4	3.7	25.8	1.8	19	0.2	94	0.0	0.0	8.0	1.3	87	
	7	8.20	69.0	219	37.1	0.13	101.0	2.7	27.0	5.3	87	1.8	127	1.3	0.0	9.6	0.0	107	
	8	7.90	31.0	110	28.5	0.13	44.3	4.4	20.2	1.3	11		71	1.7	0.8	9.3	1.2	55	
	9	8.10	54.0	194	25.9	3.85	118.5	3.4	6.2	7.6	64		119	3.7	0.0	13.0	0.6	95	
	10	8.10	57.0	203	30.2	0.32	148.9	4.4	27.5	9.6	48		117	3.6	0.0	15.3	0.3	91	
8/6/74	1	8.30	104.0	224	26.9	0.84	49.2	1.8	3.9	1.0	167	3.7	152	9.7	4.3	31.0	0.9	127	12.4
	2	7.90	112.0	302	26.9	0.42	90.2	1.1	16.3	3.9	141	2.8	178	7.7	1.8	39.3	0.6	154	32.7
	3	7.85	107.0	299	28.6	0.52	40.7	0.4	2.2	4.9	160	1.7	142	2.6	0.0	17.0	0.5	154	
	4	8.00	107.0	315	29.4	0.47		0.7	10.7	5.9	144	0.5	206	4.7	0.3	15.3	0.3	158	37.9
	5	7.95	96.0	272	19.3	0.47	116.1	1.1	9.0	6.4	134	2.4	158	10.0	2.3	28.0	0.7	123	32.7
	6	7.20	12.0	158	19.3	0.52	86.2	0.7	20.2	2.0	64		94	15.0	0.8	55.5	0.4	71	39.2
	7	8.10	70.0	220	50.4	0.21	116.3	0.7	18.0	5.4	143	0.2	127	10.8	2.1	25.2	1.4	115	33.6
	8	7.40	29.0	111	16.8	0.37	34.0	1.1		2.0	60		55	2.7	0.0	23.0	0.3	59	12.8
	9	7.40	57.0	199	30.3	0.37	116.3	1.1		7.4	92	0.1	148	15.0	7.8	36.5	0.8	87	22.0
	10	7.70	60.0	211	37.0	0.31	148.6	1.4		10.3	109	1.8	101	18.0	3.7	36.0	0.5	91	20.5

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	$SO_4^=$ mg/l
8/10/74	1	8.45	109.0	234	28.0	0.31	108.9	41.0		1.6	117	1.0	199	7.6	2.4	6.0	1.3	127	
	2	8.20	126.0	320	21.7	0.26	85.1	4.5		4.7		1.1	257	8.0	0.0	2.0	0.5	194	
	3	8.20	115.5	325	18.9	0.31	101.7	2.0		6.3	175	0.2	250	2.3	0.3	2.7	0.2	160	
	4	8.10	113.5	326	14.7	0.47	14.8	3.7		6.3	175	1.4	262	4.4	0.0	0.7	0.2	158	
	5	8.20	99.0	288	22.4	0.57	26.9	17.7		7.9	148	15.8	188	6.4	0.3	8.0	0.5	137	
	6	7.60	24.5	182	20.3	0.47	31.7	2.5		2.6	99	1.1	126	26.2	0.0	3.3	0.8	104	
	7	8.05	82.0	247	18.9	0.31	12.6	1.7		6.3	161		154	10.4	0.0	10.8	0.2	102	
	8	7.65	33.5	121	19.6	0.47	37.4	3.9		1.8	83	0.6	97	2.8	0.3	1.5	0.4	87	
	9	8.05	64.0	214	23.1	0.47	108.8	2.2		9.2	153	1.0	128	54.8	1.0	24.5	0.4	102	
	10	8.15	75.0	252	16.8	0.47	194.0	2.0		15.3	118		144	4.8	0.7	40.0	0.7	119	
8/13/74	1	8.20	110.0	228	34.0	0.89		6.9		2.1	151	1.8	195			71.3		120	
	2	7.95	126.0	313	23.6	0.13		3.5		4.4	205	76.8	205			33.3	0.3		
	3	8.00	117.0	321	19.1	0.19		2.1		5.2	189	1.1	183		1.0	0.0	0.4		
	4	8.00	119.0	323	18.4	0.38		2.9		9.9	214	1.7	172		0.0	0.0	0.6		
	5	8.15	99.0	282	19.9	0.19		3.5		4.2	183	2.0	182		0.0	5.0	0.2		
	6	7.15	24.0	167	69.5	0.19		3.2		2.1	174	0.5	152		0.8	13.0	0.1		
	7	8.25	81.0	247	19.1	0.32		5.1		6.0	179	8.5	176		1.5	23.0	0.1	106	
	8	7.55	35.0	110	22.1	0.13		2.1		1.8	110	1.7	100		0.3	31.0		77	
	9	7.70	66.0	208	14.0	0.51		1.6		8.3	143	1.2	144		5.2	53.0	0.8		
	10	7.70	89.0	291	22.9	0.51		3.5		22.4	206	0.1	186		0.0	70.0	0.5	109	
8/20/74	1	8.35	111.0	233		0.27	55.7	1.8		0.9	50	9.8	63	18.3	5.3	43.0		141	23.2
	2	8.00	129.0	339		0.16	129.2	1.2		4.2	133	19.7	135	7.0	0.8	12.0		183	57.2
	3	8.20	120.0	332		0.54	146.3	0.3		5.6	141	14.1	110	3.3	1.6	14.4		180	69.1
	4	8.20	121.0	335		0.16	129.7	0.9		6.9	159	10.5	153	6.4	0.5	12.0		176	70.4
	5	8.15	104.0	294		0.38	133.7	0.3		6.9	157	0.5		7.7	1.4	23.3		149	57.8
	6																		
	7	7.80	62.0	197		0.32	147.5	0.6		4.8	53			14.0	0.4	39.2		117	40.1
	8	7.60	36.0	128		0.22	42.0	0.9		1.5	9			8.3	0.0	14.0		73	35.8
	9	7.90	61.0	191		0.27	108.1	1.2		7.5	66			1.3	1.0	29.0		88	32.0
	10	8.10	94.0	307		0.48	415.1	1.2		24.5	149		102	12.0	6.6	52.7		135	40.2

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	$SO_4^=$ mg/l
8/27/74	1	8.00	107.0	258	28.6	0.51	124.1	1.0		1.0	115	2.5	118	6.0	1.7	41.0	0.8	117	
	2	8.15	132.0	355	50.5	0.83	161.4	2.1		4.7	157	5.2	206	3.3	2.7	37.0	1.2	168	
	3	8.20	121.0	353	47.6	0.51	101.6	1.7		5.2	186	3.5	205	3.0	2.0	24.0	0.6	170	
	4	8.35	126.0	353	37.1	0.51	77.3	2.1		6.8	165	3.3	203	4.0	0.4	12.0	0.8	164	
	5	8.10	89.0	303	26.7	0.51	211.6	2.1		7.3	135	2.2	166	5.3	1.4	44.0	0.6	143	
	6	7.30	21.0	93	43.8	1.22	110.0	3.1		1.6	1		49				0.5	56	
	7	7.95	65.0	209	38.1	0.64	83.9	6.2		4.7		2.3	121	0.0	0.4	63.0	0.5	92	
	8	7.50	37.0	138	52.4	0.45	16.9	9.3		1.6	51	2.2	73	0.3	0.6	24.0	0.4	61	
	9	7.90	60.0	185	91.4	0.83	107.1	3.4		7.8	50	1.7	104	4.4		61.5	0.5	83	
	10	8.00	93.0	322	57.1	1.03	451.5	3.1		24.0	127	1.2	159	16.4		76.0	0.5	127	
8/29/74	1B	8.00	166.0	292	132.4	0.43	2.6	1.7	5.3	1.0	158	3.6	124	13.0	7.0	11.2		154	
	1	7.95	111.0	235	88.6	0.43	16.3	3.1	4.6	2.8	138	2.5	80	4.2	1.3	16.4		125	
	2																		
	3																		
	4	7.80	125.0	340	64.8	0.37	129.9	1.4	21.1	6.4	185	5.2	174	0.7	0.1	9.6		154	
	5																		
	6																		
	7																		
	8																		
	9	7.50	58.0	195	66.7	0.49	109.3	2.7	4.0	8.0	100	2.3	85	9.4	0.8	23.1		85	
	10																		
9/3/74	1B	8.20	176.0	300	69.7	0.06	41.0	0.7		1.3				15.0	3.1	57.3		149	3.1
	1	8.25	116.0	236	73.0	0.06		2.2		2.3				9.1	0.3	28.7			15.8
	2	7.95	141.0	356	71.9	0.06	73.7	0.7		4.9								168	54.7
	3	8.05	130.0	360	60.1	0.13	56.2	0.7		6.4								160	
	4	8.02	130.0	339	57.9	0.06	92.3	0.4		9.5				2.3	0.2	50.7		156	50.8
	5	7.82	81.0	229	52.5	0.26	107.4	0.7		2.6								107	38.7
	6	7.05	23.0	100	71.9	0.13	73.6	0.4		1.5								44	45.4
	7	7.80	73.0	217	60.1	0.06	86.0	0.4		5.4								97	37.4
	8	7.70	43.0	136	57.9	0.06	19.0	0.4		1.9								61	19.6
	9	7.65	69.0	209	61.1	0.26	133.1	0.7		7.5				10.4	0.7	50.0		89	22.8
	10	7.85	100.0	318	69.7	0.58	451.4	0.7		24.5								131	19.8

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	$SO_4^=$ mg/l
9/14/74	1B		179.0	299	30.9	0.20			21.7	1.3	204	1.6	227	20.0	0.4	28.0		137	
	1	8.15	110.0	223	59.1	0.07			42.1	2.3	159	2.1	172	7.3	0.7	19.0	0.9	86	
	2	8.22	142.0	363	88.2				8.6	4.9	271	0.7	207	0.4	0.0	4.0	1.0	138	
	3	8.25	135.0	359	18.1	0.13	8.0		17.8	5.4	288	0.5	270	0.0	0.0	2.0	1.6	152	
	4	8.25	133.0	355	100.1	0.07	69.0		10.5	8.0	288		218	1.3	0.0	6.0	1.1	142	
	5	8.11	114.0	318	77.1	0.07	85.3		17.1	7.0	217	0.6	220	2.0	0.3	24.7	1.0	119	
	6																		
	7	8.02	85.0	262	54.0	0.20	73.0		8.6	6.4	171		230	1.6	0.4	41.0	1.5	98	
	8	7.75	42.0	138	42.9	0.07			4.6	2.8	97	1.1	114	4.3	0.3	17.0	1.1	56	
	9	7.95	77.0	169	93.3	0.13	81.2		11.2	9.0	194	1.6	212	7.6	0.4	27.0	1.0	80	
	10	8.07	102.0	325	46.3	0.47	536.1		5.9	27.1	235	0.4	319		17.1	154.0	2.0	106	
9/21/74	1B	8.45	180.0	293	9.7	0.59	33.7	4.5	11.4	1.5	72	2.4	92	3.0	0.4	24.0	1.3	174	
	1	8.28	118.0	237	13.1	0.65	16.0	3.4	12.8	1.0	144	2.9		4.4	0.4	22.0	2.1	130	
	2	8.30	138.0	361	15.3	0.52		3.4	17.8	5.1	203	5.1	174	0.0	0.0	2.0	1.1	187	
	3	8.50	137.0	365	12.5	0.72	62.1	1.4	10.7	7.1	148	2.8	247	0.8	0.0	10.0	0.7	191	
	4	8.28	137.0	339	165.5	0.92	116.5	8.6	17.1	6.9	100	2.2	219	0.8	3.6	10.0	0.3	191	
	5	8.20	119.0	315	28.8	0.65	113.5	4.8	10.7	7.7	180	2.9	155		0.0	273.3	1.3	146	
	6	7.75	29.0	204	15.3	1.24	98.8	8.2	19.2	2.3	66	2.1	121	1.5	0.0	98.0	0.5	122	
	7	8.05	88.0	239	24.4	0.65	85.7	2.4	9.3	5.1	142	2.6	109	1.6	0.0	70.0	0.5	110	
	8	7.50	33.0	101	16.0	0.65	15.5	261.2	267.6	3.1	12	24.1	71	5.2	0.3	44.5	0.9	57	
	9	7.95	75.0	212	31.9	1.05	109.7	11.0	34.2	10.5	77	3.3	96	12.0	0.0	108.0	1.5	110	
	10				10.6	1.18		5.8	14.2	27.6	197	3.4	191	22.8	14.0	212.0		138	
9/29/74	1B			288	177.4	0.64	30.7	250.0	274.7	0.3	116	0.9	38	2.5	1.0	22.0		164	3.9
	1			227	28.3	0.23	4.9	8.9	28.5	5.6	70	0.9	50	2.3	0.8	32.0	1.6	135	19.7
	2			354	47.9	0.23	58.2	8.9	17.1	4.8	159	2.8	160	0.0	0.0	0.0	1.9	185	79.5
	3			353	46.0	0.40	56.0	4.6	66.9	6.6	183	0.2	171	0.0	0.2	7.2	0.2	189	82.7
	4			328	47.9	0.29	121.9	5.0	14.2	7.1	135		88	2.8	0.3	11.2	1.0	177	
	5			300	50.9	1.10	88.2	6.6	14.2	8.2	132	1.9	117	20.0	0.4	20.0	0.3	156	52.2
	6			204	56.8	0.35	90.6	2.6	8.5	4.1	92	0.1	68	6.3	3.0	26.0		93	83.3
	7			270	45.0	0.58	76.0	32.1	40.6	7.1	100	0.5	103	8.0	0.5	52.0	0.7	147	56.0
	8			110	37.2	0.06	13.5	5.3	14.9	2.6	1	2.0	18	8.4	0.0	9.0		59	13.8
	9			217	56.8	0.93	62.9	7.3	12.8	10.7	81	0.3	23	17.2	1.4	204.0	0.7	101	29.8
	10			315	65.6	1.16	496.6	5.6	11.4	25.8	121	0.2	94	22.5	20.7	240.0	0.6	160	23.2

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	$SO_4^=$ mg/l
10/5/74	1B	8.05	161.0	298	75.8	1.09	30.7	2.5	5.6	5.0	218	5.3	202	1.0	0.0		0.9			
	1	8.05	99.5	233	90.2	0.90	138.0		17.5	1.0	194	2.6	163	0.7	0.0	23.0	0.4			
	2	7.65	127.5	406	70.0	1.09	68.4	2.8	17.5	4.6	340	9.5	292	0.0	0.0	4.0	2.1			
	3	7.65	127.5	387	90.2	0.96	172.0		5.6	3.8	278	2.0	290	0.0	0.0	6.0	1.3			
	4	7.90	121.0	336	61.4	0.51	260.6	1.4	9.8	8.6	267		246	0.0	0.0	14.0	2.2			
	5	7.95	107.5	316	89.3	0.77	108.6	3.9	10.5	7.6	223	0.6	189	0.4	0.0	55.3				
	6	7.20	32.5	215	68.1	1.16	138.6	0.7	15.4	1.9	201	1.3	155	5.2	3.2	27.3	0.7			
	7	7.70	89.5	287	72.0	0.90	172.8	0.4	4.9	7.1	204	2.6	174	0.8	0.0	40.0	1.3			
	8	7.30	38.0	114	75.8	0.32	194.1		8.4	1.4	137	1.0	103	0.8	0.4	13.0	1.2			
	9	7.50	71.0	221	75.8	0.71	108.7	0.7	11.9	10.1	186	1.4	209	0.4	1.2	74.0	1.3			
	10	7.40	103.5	333	44.1	1.03	373.6	1.1	7.0	27.1	240		297	2.4	1.6	68.0	1.0			
10/12/74	1B	8.30			68.8	0.58	37.9	5.8			164	2.6		3.0	0.0		0.7	155	27	2.8
	1	7.98			87.2	0.58	22.2	11.7		0.4	126			13.2	7.0	2.0	0.7	113	32	16.9
	2	8.10			85.3	0.53	89.5	5.5		3.7	209			13.2	0.0	1.0		168	51	40.7
	3	7.70			50.5	0.47	102.9	3.6		3.7	268	0.4		0.0	0.0	1.3	0.0	162	44	50.1
	4	8.20			64.2	0.53	170.7	6.1			220	0.4		1.0	0.0	3.0	0.3	114	46	31.3
	5	8.15			62.4	0.58	90.4	9.1		5.4	169	1.1		8.8	0.0	6.0	0.9	133	41	32.6
	6	8.15			69.7	0.53	114.9	5.5		6.2	220	1.0		16.4	0.0	8.0		150	40	37.3
	7	8.05			89.0	0.58	103.4	5.5			214			0.0	2.0	9.3	2.0	135	38	35.2
	8	8.15			64.2	0.53	55.3	15.5		0.4	113			1.8	0.0	3.0	1.1	70	25	17.4
	9	7.95			91.7	0.58	116.6	3.9		10.4	150	1.7		5.8	0.0	64.0	0.3	110	31	19.2
	10	7.70			59.6	0.64	489.8	5.8		25.3	197	0.4		0.4	0.0	106.0	1.0	135	28	14.7
10/19/74	1	8.40	105.0	260	85.7	0.44		2.7		1.0	90		141	50.0	0.0	1.0		135	39	15.3
	2	8.15	128.0	377	243.9	0.29	63.9			3.1	156			0.0	0.0	1.5	0.4	172	60	41.4
	3	8.30	129.0	387	151.3	0.22	71.2	2.7		4.4	187		213	0.0	0.0	11.0		195	49	51.9
	4	8.28	125.0	354	163.6	0.52	121.5	3.0		5.6	145		199	0.0	0.0	4.0	0.3	170		29.6
	5	8.25	108.0	326	145.5	0.96	96.7	1.7		5.6	112		193	4.0	0.0	24.0	0.3	148	41	26.8
	6	7.55	28.0	241	180.0	0.37	109.7	1.7		1.5	94		139	2.8	0.8	9.3	0.1	101	40	48.6
	7	8.05	84.0	269	122.6	0.44	118.6	0.3		6.0	123		157	0.8	0.0	7.0	0.5	137	39	28.8
	8	7.88	40.0	168	108.6	0.07	73.1			1.9	47		60	0.7	0.0	3.0		83	29	16.9
	9	8.00	75.0	240	67.7	0.59	114.1	2.0		12.3	86		98	0.8	4.4	62.0	0.3	101	32	9.6
	10	7.98	102.0	358	69.3	0.59	366.4	1.3		19.3	96		191	5.2	2.7	52.0	0.3	121	39	13.9

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
10/26/74	1				51.8	0.45	47.1				174		168	7.0	0.6	3.0		152	30		37.3
	2				51.0	0.51	174.5				282	1.6	199	5.2	0.0	0.8			27		53.2
	3				46.6	0.76	144.8				241	0.6	280	0.0	0.0	10.0		222	37		64.7
	4				56.2	0.45	120.8				294	0.1	222	1.6	0.0	0.8		197	32		47.6
	5				72.7	0.57	175.9				206		192	6.0	0.0	8.7		175	28		44.2
	6				59.7	0.51	41.0				160		165	11.7	0.0	4.0		127	37		72.4
	7				66.6	0.83	142.1				202	0.1	192	10.0	0.2	26.0		163	35		44.2
	8				68.3	0.70	116.9				226	0.1	194	8.0	0.0	22.5		163	36		42.9
	9				190.1	0.95	93.8				179	0.6	143	8.8	1.0			137	32		21.7
	10				67.5	0.89	363.4				261	0.3	232	0.0	2.0	12.0		165	41		21.7
11/2/74	1	8.05	93.0	228	49.3	1.19	3.2	18.9	26.1	2.4		5.7		3.6	0.4	0.8	1.2			23.9	8.5
	2	8.10	127.0	345	43.4	0.63	63.0	6.1	6.5	5.8		3.2		0.0	0.0	0.4	1.2			156.8	31.2
	3	8.10	123.0	380	40.0	1.13	48.7	5.4	13.1	8.7		2.4		0.0	0.2	0.8	1.1			74.4	38.3
	4	8.10	120.0	345	65.4	0.37	136.6	5.7	6.5	8.7		2.4		0.0	0.0	1.2	1.3			60.8	21.7
	5	8.05	105.0	320	72.2	0.50	131.9	3.4	3.9	9.2		2.9		7.2	0.0		1.4			33.0	16.1
	6	7.50	25.0	214	68.8	0.13	124.9	4.4		3.9		2.2		53.6	0.0		1.2			36.4	41.0
	7	7.98	82.0	279	61.2	0.56	144.2	6.1	6.5	7.5		2.3		1.2	0.2		1.2			27.3	31.9
	8	7.85	38.0	158	47.6	0.44	73.0	4.0	10.5	4.5		2.6		3.2	0.0		1.3			14.2	12.0
	9	7.95	71.0	221	73.1	0.31	113.9	5.1	15.7	14.3		2.2		19.2	0.2	15.0	1.0			26.7	7.0
	10	7.90	99.0	343	56.1	0.69	447.6	5.1		28.2		1.0		3.6	0.0		1.0			73.9	8.5
11/9/74	1	7.85	101.0		46.5	0.50	51.2	4.2		3.5		2.2		28.3	1.3	1.4	1.2		33		15.6
	2	7.85	130.0		49.0	0.56	42.9	4.8		2.9		0.5		24.0	1.2	2.3	0.9		49		44.7
	3	7.80	115.0		53.2	0.62		2.6						0.8	0.0	1.8	1.8		53		54.8
	4	7.95	121.0		77.3	0.37	158.3	3.9		8.3		5.1		1.3	0.0	1.8	0.2		35		25.9
	5	7.95	102.0		69.8	0.50	139.0	4.8		7.7		3.0		1.2	0.0	2.5	1.3		34		23.1
	6	7.28	25.0		52.3	0.43	137.9	4.2		1.3		0.5		16.0	1.0	3.0	1.6		37		46.1
	7	7.85	88.0		62.3	0.56	145.7	2.9		7.2		1.7		20.8	0.0	1.0	1.0		39		25.9
	8	7.45	48.0		79.0	0.50	129.3	2.9		1.3				21.0	0.0	1.3	1.1		25		13.8
	9	7.72	71.0		65.7	0.50	124.5	2.9		12.6		0.1		3.5	0.5	15.3	1.0		29		10.4
	10	7.65	97.0		60.7	0.74	566.6	5.5		28.6				4.0	0.0	4.0	1.2		43		12.1

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
11/11/74	1	7.25	86.0	256	71.7	0.92	66.5	5.9	8.6	2.0	130	0.4	78	2.0	0.0	1.0	0.6	157	34	33.9	26.8
	2	7.80	119.0	392	43.4	0.74	78.6	2.3	2.5	4.9	137	1.1	215	0.0	0.0	1.0	1.3	204	48	466.9	78.4
	3	7.90	114.0	408	15.9	1.17	113.5	2.3	4.9	7.1	172	0.8	221	0.0	0.0	6.4	0.3	191	49	69.3	77.8
	4	7.98	116.0	358	15.9	0.68	156.5	3.9	6.8	8.1	136	0.4	176	4.0	0.0	0.8	1.3	174	42	89.0	57.4
	5	7.90	106.0	327	23.4	0.74	175.5	2.9	3.7	8.9	121	0.1	163	1.0	0.0	0.0	1.8	146	38	70.9	44.5
	6																				
	7	7.82	89.0	310	22.5	0.43	166.3	2.3	6.8	9.1	152			4.4	0.0	2.0	0.6	148	37	50.4	44.1
	8	7.55	44.0	188	89.2	0.37	134.3	2.6	3.1	2.7	14	0.2	57	3.6	0.0	0.5	1.3	104	38	2.4	29.7
	9	7.65	70.0	248	16.7	0.43	175.8	3.3	7.4	18.7	111	0.7	96	1.2	0.0	0.0	1.5	133	46		18.6
	10	7.70	98.0	359	41.7	1.72	565.0	4.9	4.9	24.7	152	0.2	158	1.2	0.0	24.0	1.4	150	38	126.8	24.9
11/23/74	1	7.72	90.0	237										0.9	0.2	2.0	1.4				
	2	7.75	130.0	415	40.6	0.49	68.6	2.5		4.3	116	0.5	232	0.0	0.0	0.3	1.8	190	50	50.0	44.5
	3	7.78	116.0	422	48.0	0.67	118.2	2.8		10.2	144	18.7	217	0.0	0.3	2.3	1.0	181	44	95.1	41.7
	4	7.80	116.0	377	149.8	0.97	203.5	3.9	6.2	9.4	85	8.0	225	0.0	0.0	1.7	1.0	157	42	39.3	29.3
	5	7.75	107.0	303	54.4	0.55	136.0	3.2	3.5	9.7	114	2.6	207	0.0	0.0	0.0	1.3	136	39		20.6
	6																				
	7	7.70	84.0	308	20.2	0.49	152.1	2.8	4.8	8.0	132	1.7	163	0.8	0.0	3.2	1.3	126	36	15.6	23.4
	8	7.40	45.0	176	22.0	0.37	147.2	3.2	5.5	2.2		1.8	74	0.0	0.0	0.0		73	28		22.2
	9	7.55	68.0	236	28.5	0.61	153.6	2.8	2.8	15.1	141	0.6	114	8.6	3.6	12.0	0.7	87	28	40.2	49.2
	10	7.58	95.0	340	53.5	0.67		4.2	6.2	9.4	81	0.4		1.0	0.2	28.0	0.8	134	43		18.5
11/26/74	1	7.80	101.0	238	61.1	0.25	70.6	2.3	4.9	1.7	105	1.5	113	13.2	0.2	1.6		118	31		
	2	7.80	129.0	411	74.8	0.37	69.1	0.3		10.5	221	9.9	215	10.6	0.0	0.4		179	33		
	3	7.75	119.0	376	193.0	0.31	105.7	0.7		7.4	172	2.1	190	6.6	0.0	0.0		170	33		
	4	7.90	125.0	354	19.3	0.25	161.8	1.7		7.9	164	3.3	169	1.6	0.0	7.2		159	32		
	5	7.85	111.0	325	256.6	0.37	163.3	2.0		8.2	197	25.7	149	2.2	0.0	34.4		156	28		
	6																				
	7																				
	8																				
	9																				
	10																				

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	$SO_4^=$ mg/l
11/29/74	1	7.70	100.0	232		1.43	78.0	33.0		3.1	95		109	3.2	0.0	0.0	2.1	121	33	
	2	7.60	131.0	318		1.75	86.6	29.3		4.7	180	2.7	197	0.0	0.0	0.0	1.9	187	49	
	3	7.35	125.0	357		0.45	131.9	37.4		7.6	201	33.6	231	0.2	0.0	0.0	1.7	183	48	
	4	7.70	129.0	322		1.23	202.0	36.7		9.1	184	2.2		1.4	0.0	0.0	1.3	167	43	
	5	7.50	113.0	301		0.26	175.0	32.7		9.2	155	3.6	107	5.0	0.0	2.8	1.2	145	40	
	6																			
	7																			
	8																			
	9																			
	10																			
12/1/74	1	8.18	102.0	229		0.98	75.5	51.6		2.8	174	1.2	214	10.0	0.0	0.8	1.6	123	33	
	2	8.12	145.0	360		0.65	75.2	37.3		3.3	277	4.9	322	8.0	0.0		2.1	193	34	
	3	8.05	131.0	400		0.46	121.2	39.3		7.3	217	6.3	254	0.2	0.0	0.2	1.5	185		
	4	8.25	131.0	343								7.9	243	0.5	0.0	0.2	1.5			
	5	8.20	115.0	272		0.52	170.3	35.1		8.5	121	6.2	235	0.0	0.0	1.1	2.1	160	41	
	6																			
	7	8.10	100.0	287		0.79	165.4	58.1		7.3				2.2	0.0		1.4	135	39	
	8	7.80	44.0	136		0.65	142.1	44.8		3.6				13.4	0.0		1.5	77	28	
	9	7.95	79.0	225		0.65	169.0	50.6		14.3				4.8	0.2		1.8	101	29	
	10	7.65	105.0	269		1.18	556.2	73.1		28.3				6.8	2.6		1.7	147	43	
12/7/74	1	7.90	105.0	210	30.3	0.54	73.0	5.6	19.4	1.9	52	3.1	107	5.6	0.8	0.8	0.9	119		16.9
	2	7.92	137.0	375	26.8	0.54	63.0	5.6	17.4	3.6	156	4.3	230	15.6	0.0	20.3	1.2	184	37	42.1
	3	7.88	122.0	365	36.3	0.54	137.9	2.4	12.9	7.8	140	25.3	284	0.0	4.2	2.8	1.1	178		46.2
	4	8.00	130.0	336	27.7	0.48	160.1	3.8	15.5	5.5	96	9.0	181	5.4	0.0	0.8		168		34.4
	5	7.92	111.0	299	32.8	0.48	177.3	2.8	12.3	10.2	75	11.7	177	0.0	0.0	1.6	0.6	143		26.9
	6																			
	7																			
	8																			
	9	7.78	79.0	233	33.7	0.42	186.4	3.1	14.2	13.7	34	1.8	110	20.8	0.0	6.0	0.9	100		11.6
	10	7.70	108.0	336	44.1	0.48	495.5	3.8	15.5	24.6	105	2.1	192	23.0	3.4	4.0	0.8	142	42	15.7

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
12/24/74	1																				
	2	7.70	130.0	392		0.58	110.6	1.3		4.8	298	5.6	301	2.0	0.0	2.6		188	43	137.1	48.4
	3	7.85	140.0	348		0.14	163.1	2.7		6.6	262		265	0.6	0.0	0.0			44	56.9	23.0
	3A	7.70	82.0	280		0.36	141.4	1.3		8.1	209	3.4	219	0.8	0.0	0.4		124	30	18.8	21.2
	4	8.05	124.0	363		0.36	190.4	3.0	6.7	8.3	249	5.7	262	7.2	0.0	1.4		161	34	27.7	30.5
	5	7.90	114.0	320		0.72	177.4	1.3		8.6	262	3.5	246	3.0	0.0	2.2		145	33	31.2	23.2
	6																				
	7																				
	8																				
	9	7.85	80.0	254		0.58	207.8	2.3		16.2	180	0.1	184	9.2	0.0	2.0		104	30		6.1
	10	7.78	125.0	439		0.72	690.5	1.7	5.4	25.5	285	1.0	273	13.4	0.4	0.4		168	34	2.5	16.1
12/27/74	1																				
	2	7.80	127.0	396	48.4	1.00	113.6	2.0		5.1	220	4.9	195	4.0	0.0	0.0		180	58	200.0	74.8
	3	7.90	136.0	361	76.3	0.31	167.6	2.0	2.8	7.6	201	1.0	175	0.0	0.0	1.6		153	46	66.7	36.3
	3A	7.68	80.0	266	56.6	0.56	166.4	2.0	2.1	11.0	144	2.0	116	2.6	0.0	0.0		124	33	34.0	21.4
	4	8.05	121.0	336	47.6	0.56	174.6	2.2	2.8	7.6	162	2.5	146	4.6	0.0	0.4		169	43	42.3	29.8
	5																				
	6																				
	7																				
	8																				
	9	7.88	75.0	246	48.4	0.87	184.6	2.5	2.8	12.4	111	0.7	94	7.2	0.0	4.8		127	35	9.6	18.1
	10	7.70	114.0	376	47.6	0.69	607.0	2.2	12.5	27.9	173	0.1	183	10.4	0.3	8.6		178	48	13.5	23.3
12/29/74	1																				
	2	7.85	125.0	365	36.6	0.41	106.2	0.6	3.6	4.3	193	1.3	291	0.0	0.0	0.3	1.5	196	59	195.4	60.6
	3	8.00	136.0	367	25.2	0.29	173.8	3.9	4.2	6.1	144	1.0	239	0.0	0.0	5.2	2.5	169	49	74.5	35.6
	3A	7.78	79.0	268	82.5	0.29	152.4	0.3	0.6	9.6	70	3.3	168	6.3	0.0	0.9	2.3	111	31	38.6	36.3
	4	8.10	120.0	348	25.2	0.24	198.3	3.3		7.6	107		217	0.0	0.2	6.8	1.3	162	51	59.5	26.6
	5																				
	6																				
	7																				
	8																				
	9	7.98	76.0	261	39.9	0.53	158.5		0.6	12.4	60	0.4	134	4.4	0.0	6.8	1.5	105	33	14.4	15.2
	10	7.80	117.0	386	108.8	0.76	620.7		3.0	26.3	156	0.2	240	6.8	0.0	4.8	1.8	166	52	31.4	25.9

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
1/18/75	1																				
	2	7.80	117.0	409	78.6	0.51	129.6	0.7		4.9	245	2.3	300	0.0	0.0	0.0	0.4	187			96.1
	3	7.98	137.0	352	43.3	0.45	221.6	3.5		6.9	204	1.3	258	0.0	0.0	0.0	0.0	122			39.8
	3A	7.80	91.0	295	57.7	0.39	166.3	2.8		10.3	175	2.3	212	0.2	0.0	0.0		170	25		36.1
	4	8.18	121.0	339	55.5	0.90	163.8	3.5		8.2	203	3.0	245	0.2	0.0	0.5	0.2	153	51		35.9
	5																				
	6																				
	7																				
	8																				
	9	8.05	77.0	248	31.1	0.77	180.2	2.8		14.4	147	1.1	167	1.2	0.0	7.4	0.4	103	33		15.0
	10	7.85	123.0	385	90.8	0.64	589.9	4.2		25.7	209	1.2	269	0.0	0.0	0.9	1.4	158	53		25.8
1/25/75	1																				
	2	7.58	107.0	440	76.4	0.85	156.1	6.8	8.0	29.9	250		227	0.0	0.0	3.2	0.7	178	43	253.4	80.8
	3	7.80	135.0	325	27.6	0.39	192.1	3.7	9.3	8.1	162		145	0.2	0.0	0.4	0.8	174	29	34.3	38.2
	3A	7.60	90.0	268	66.9	1.37	179.7	3.1	6.0	11.7	168		144	2.6	0.0	1.2	0.6	128	35	8.1	34.0
	4	7.95	124.0	323	44.3	0.59	189.3	3.1	6.0	9.6	138		163	2.2	0.0	4.2	0.9	158	25	152.5	37.4
	5	7.98	110.0	294	76.4	0.92	190.3	3.7	6.0	12.7	168		138	2.0	0.0	2.4	1.1	139	26	19.1	38.5
	6	7.35	33.0	226	68.1	0.52	173.2	1.7	6.6	2.5	118		116	2.6	0.0	2.8	0.6	119	39		63.1
	7	7.90	88.0	266	58.6	0.72	163.1	3.1	4.0	9.6	134		124	4.4	0.0	7.2	1.2	127	30	17.8	41.0
	8	7.50	44.0	166	52.6	0.79	142.7	3.1	4.7	3.0	46		31	0.4	0.2	2.8	1.1	83	30		27.7
	9	7.80	74.0	225	46.7	0.79	175.7	1.7	4.0	14.2	118		92	14.8	2.8	2.2	0.7	98	30		21.5
	10	7.70	114.0	339	71.7	1.77	702.5	2.7	6.0	25.4	190		168	28.2	0.0	46.2	1.2	159	27	6.4	31.9
2/2/75	1																				
	2	7.72	88.0	356	47.1	0.69	108.4	2.4	5.3	8.5	220	4.4	230	0.0	0.0	0.0	2.9	178	45	327.6	98.5
	3	8.05	139.0	336	53.7	0.32	147.7	4.5	12.6	7.2	211	0.9	176	0.2	0.0	0.0	0.9	175	47	68.6	34.9
	3A	7.80	93.0	276	35.9	0.69	121.2	2.8	4.6	11.3	101	2.0	172	1.6	0.0	0.0	1.6	126	33	17.9	35.7
	4	8.22	123.0	319	34.8	0.95	139.1	3.1	6.6	9.2	180	0.2	176	0.6	0.0	0.4	1.9	155	44	50.6	41.0
	5	8.20	114.0	307	35.9	0.44	158.4	2.8	6.0	10.3	133	1.3	192	0.8	0.0	0.6	2.2	146	42	1.3	34.0
	6																				
	7																				
	8																				
	9	8.08	80.0	236	99.3	0.50	146.7	3.1	7.2	15.9	42	0.6	69	5.6	0.0	0.6	2.0	112	30		13.7
	10	7.92	128.0	373	34.8	0.69	563.9	6.2	12.6	26.7	153	0.3	165	8.6	0.0	0.4	1.6	167	51	63.5	33.1

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
2/8/75	1																				
	2	7.55	66.0	393	41.4	0.26	30.1	3.2	8.0	7.3	226	26.9		0.0	0.0	0.4	0.4	212	46	465.1	92.2
	3	8.14	123.0	431	56.6	0.20	102.8	8.6	9.3	7.1	218	2.4		0.0	0.0	0.2	1.8	211	44	92.9	44.2
	3A	7.90	82.0	325	49.0	0.40	156.8	5.1	6.0	10.9	181	8.3		0.0	0.0	5.2	1.9	135	33	35.7	31.8
	4	8.28	109.0	406	63.2	0.53	148.3	3.5	6.7	9.0	215	11.7		1.4	0.0	0.8	1.5	164	45	60.3	42.9
	5	8.28	96.0	384	49.0	0.33	156.1	2.6	4.0	9.7	216	1.6		0.6	0.0	0.4	1.8	142	41	23.8	33.4
	6																				
	7																				
	8																				
	9	8.00	66.0	279	31.6	0.86	90.1	6.4	9.3	10.4	186	2.1		6.4	2.6	2.0	2.4	125	33	127.0	29.6
	10	7.92	107.0	456	81.6	0.79	658.6	3.8	25.3	23.4	246	1.6		6.2	0.0	4.4	1.5	172	52	19.8	29.6
2/15/75	1																				
	2	7.10	26.0	354	45.1	0.79	139.9	3.0	10.9	13.9	216	10.6	251	0.0	0.0	0.0	1.1	150	48	230.1	142.7
	3	7.88	119.0	337	37.4	0.94	206.9	2.3	8.9	6.8	206	2.9	195	0.0	0.0	0.4	1.7	174	38	4.5	35.8
	3A	7.65	71.0	277	37.4	0.72	148.7	1.3		15.4	145	5.5	92	4.4	0.0	0.0	1.2	125	34	0.8	33.3
	4	8.08	111.0	335	83.6	1.23	205.7	3.6	10.9	8.8	178	4.2	198	5.8	0.0	1.2	2.1	161	32	52.6	42.8
	5	7.95	95.0	304	29.7	0.51	155.8		10.9	9.8	155	1.5	144	2.4	0.0	0.6	1.9	143	37	40.6	33.9
	6	7.12	26.0	236	25.9	0.65	155.2	2.0	12.0	3.8	132	1.6	120	3.6	0.0	0.6	1.0	117	43	32.3	68.2
	7	7.90	80.0	286	75.9	1.23	148.3	1.0	13.5	9.8	154	1.4	158	11.6	0.0	0.6	1.9	134	31	38.3	35.8
	8	7.60	40.0	176	47.0	0.79	137.2	6.3	10.9	2.3	90	0.7	98	2.2	0.0	0.8	1.7	90	27	24.1	23.8
	9	7.88	66.0	248	56.6	0.87	139.8	0.7	5.7	12.3	145	2.7	88	5.4	0.8	0.8	2.4	112	30	15.8	20.6
	10	7.70	106.0	376	29.7	1.23	631.0	2.6	8.3	21.4	192	1.9	247	10.3	0.0	0.8	1.9	163	34	64.7	20.6
2/22/75	1																				
	2	6.10	7.0	358	44.9	0.13	63.4	0.3	20.7	13.1		21.0	264	0.0	0.0	0.0	1.7	165	38	42.3	186.6
	3	7.60	118.0	331	21.6	0.45	131.7	4.4	12.0	7.2		0.5	220	0.0	0.0	0.0	0.0	180	42	34.5	36.2
	3A	7.60	81.0	265	35.4	0.13	153.5	0.3	8.7	11.5		0.6	166	0.0	0.0	0.4	1.4	118	38	25.5	25.0
	4	7.50	115.0	320	31.9	0.26	142.9	2.4	6.7	9.7		2.4	206	3.8	0.0	0.6	1.6	157	43	32.3	49.4
	5	7.90	94.0	291	31.9	1.86	161.2	4.1	20.7	12.0		1.9	180	1.4	0.0	0.8	2.1	145	42	9.1	31.8
	6																				
	7																				
	8																				
	9	7.50	66.0	234	39.7	1.86	112.8	1.0	8.0	13.6			134	12.0	0.0	2.0	0.8	129	31		16.9
	10	7.40	118.0	366	33.7	0.58	722.3	1.0	11.4	26.1			240	9.0	0.0	0.2	1.9	165	40		23.7

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
3/1/75	1																				
	2	6.62	6.0	441	42.0	2.15	126.4	3.7		38.9	288	336.0	628	0.0	0.0	0.4	1.3	165	38		123.1
	3	8.20	128.0	331	65.0	0.54	178.4	2.7		8.2	221	1.0	237	0.0	0.0	1.4	0.5	176	32		31.8
	3A	8.00	61.0	252	47.7	0.54	185.5	1.3		16.5	137	3.7	164	0.4	0.0	0.0	0.8	118	28		20.3
	4	8.30	115.0	329		1.01	158.1	4.3		9.5	209	25.6	225	0.0	0.0	2.4	1.3	161	45		32.8
	5	8.30	103.0	304	42.9	2.29	160.4	5.7		10.3	210	2.8	233	0.0	0.0	2.0	0.8	149	29		25.7
	6																				
	7																				
	8																				
	9	8.22	72.0	229	33.3	1.28	166.4	4.7		14.3	108	0.6	132	2.8	0.0	3.4	1.8	102	30		16.9
	10	8.18	112.0	348	28.5	1.21	567.3	5.4		24.3	202	0.7	242	4.4	0.0	1.8	1.2	149	31		22.7
3/8/75	1																				
	2	6.80	10.0	590	83.6	2.14	114.3	2.5	3.9	86.7		38.2		0.0	0.0	6.0	1.9	163			174.9
	3	8.12	126.0	355	34.5	0.65	186.9	2.2	8.4	8.2		0.1		0.0	0.0	0.6	1.2	173			39.2
	3A	7.80	53.0	297	44.7	0.42	236.1	1.6	4.5	30.1		6.6		2.2	0.0	1.2	1.3	106	29		23.7
	4	8.32	111.0	343	26.0	0.83	172.4	2.5	9.0	13.3		8.4		4.6	0.0	15.6	1.5	165	36		37.1
	5	8.30	99.0	327	19.2	0.65	173.1	4.3	10.3	12.2		1.3		6.6	0.0	1.6	1.9	146	41		31.8
	6	8.28		295	39.6	0.71	154.4	1.0	10.9	10.7		0.9		4.8	0.0	0.8	1.6	142	40		42.4
	7	8.25	70.0	293	51.4	0.71	135.7	2.3	5.1	11.7		1.6		16.0	0.0	1.4	1.7	129	37		33.6
	8	7.90	42.0	185	161.6	0.18	113.1	7.0	7.1	2.0				6.8	0.0	0.4	1.5	80	30		23.0
	9	8.20	70.0	256	70.1	1.01	189.0	1.7	5.8	24.5		0.8		18.0	0.2	2.8	1.8	103	32		15.9
	10	8.05	108.0	365	44.7	0.83	593.9	5.0	8.4	27.6		0.8		19.2	0.0	46.6	1.1	160	46		24.7
3/15/75	1																				
	2	6.90	15.0	2401	91.4	8.53	181.3	2.8	24.2	578.3	1115	88.9	1257	0.0	0.0	10.0	1.6	163	44	112.0	127.2
	3	7.95	121.0	365	34.2	0.36	153.0	3.8	4.7	15.3	190	0.5	248	0.0	0.0	0.0	0.7	233	70	87.3	37.8
	3A	7.50	54.0	312	50.9	0.95	199.1	3.8	4.0	28.0	157	2.3	240	0.0	0.0	0.0	1.5	175	42	31.7	27.2
	4	8.05	110.0	371	33.0	1.17	155.6	2.1	8.8	13.0	203	7.4	294	1.8	0.0	2.8	0.7	214	38	37.8	37.1
	5	8.00	95.0	341	31.8	2.26		2.8	2.9	13.2	178		289	0.6	0.0	0.0	0.9	175	31	18.1	30.0
	6																				
	7																				
	8																				
	9	7.90	67.0	230	48.5	0.66	263.7	3.1	3.4	22.6	130	0.8	264	3.8	0.2	0.0	1.4	155	43	65.6	15.2
	10	7.90	103.0	382	73.5	1.82	493.8	4.9	9.3	26.2	216	0.1	305	4.8	0.0	1.0	0.7	144	42		30.0

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
3/29/75	1																				
	2	5.95	4.0	422	70.5	0.78	123.1	10.6	76.8	12.2	268		246	0.0	0.0	0.0	1.7	406	40	76.0	132.4
	3	8.05	119.0	354	36.3	0.52	186.5	119.1	175.1	8.8	196	5.7	151	0.4	0.0	0.0	0.8	195	46	107.1	25.4
	3A	8.20	74.0	298	49.4	0.65	182.6	28.7	54.5	19.2	154	5.2	143	2.4	0.0	0.4	1.5	176	30	69.5	19.7
	4	8.14	111.0	356	52.9	1.04	210.0	76.1	109.1	12.3	191	3.5	178	3.6	0.0	1.8	1.0	164	43	157.8	22.8
	5																				
	6																				
	7																				
	8																				
	9	7.95	70.0	279	36.3	1.17	277.5	0.7	16.8	31.4	158	0.1	146	4.6	0.0	0.2	1.1	133	34		9.0
	10	7.82	103.0	365	67.0	0.97	907.3	1.0	5.4	24.9	216	1.1	213	7.2	0.0	3.4	1.6	156	33	107.8	15.1
4/5/75	1																				
	2	6.00	5.0	342	98.6	5.39	147.7	7.9	16.8	20.9	231	442.1	462	0.0	0.0	0.0		207	40		135.0
	3	8.20	125.0	363	115.6	0.68	303.5	3.4	8.8	22.4	190	1.3	249	0.0	0.0	0.0		172	42		27.9
	3A	7.94	51.0	305	91.8	0.43	199.6	3.4	3.4	40.6	158	2.8	181	1.4	0.0	0.4		129	26		19.7
	4	8.40	117.0	316	117.2	0.50	143.6	2.7	10.1	12.2	150	1.0	201	1.6	0.0	1.8		176	42		24.8
	5	8.38	104.0	334	94.4	0.68	149.4	3.8		19.4	191	2.0	244	0.2	0.0	3.0		156	38		22.3
	6	7.80	33.0	296	98.6	0.31	139.4	2.7		3.6	143	0.9	170		0.0	1.2		133	40		49.2
	7	8.32	84.0	296	80.0	0.56	152.3	4.1	13.5	13.0	203	0.7	203	0.6	0.0	1.6		129	37		26.9
	8	8.05	44.0	223	56.2	0.31	143.8	2.7	7.4	4.8	134	0.4	108	2.6	0.0	0.2		86	30		20.2
	9	8.30	70.0	265	94.4	0.62	195.2	2.1	10.8	20.9	175	1.6	170	2.0	0.0	0.0		113	33		14.6
	10	8.25	104.0	308	68.9	1.92	972.0	3.8	5.4	24.9	247	0.8	201	1.6	0.0	7.2		156	41		15.1
4/12/75	1																				
	2	6.05	4.0	680		3.56	146.8	2.7	15.5	133.7	469	135.6		0.0	0.0	0.0	0.8		39		108.5
	3	7.65	90.0	352		0.38	237.4	3.0	5.4	16.3	224	67.7	313	0.4	0.0	1.6	1.1	175	42		25.3
	3A	7.25	48.0	270		0.51	206.4	2.3	9.4	25.0	168	2.2	127	0.2	0.0	1.0	0.7	133	26		18.3
	4	8.00	96.0	354		1.91	102.0	5.3	24.9	14.8	249	3.1	234	5.0	0.0	2.4	0.4	175	43		31.2
	5	7.92	80.0	335		0.89	117.4	2.7	20.2	15.3	232	0.5	192	1.0	0.0		0.5	160	41		25.3
	6																				
	7																				
	8																				
	9	7.80	61.0	275		0.89	200.4	3.3	16.2	21.4	170	0.6	156	4.2	0.4	0.0	0.7	125	33		13.1
	10	7.80	76.0	337		1.02	682.4	3.0	21.5	21.9	217	0.5	209	9.2	0.0	0.6	1.0	160	43		17.8

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
4/19/75	1																				
	2	6.45		492		3.44	137.8		68.6	53.5	261	69.0	326	0.0	0.0	0.0	1.4	534	38	116.1	106.2
	3	7.62		352		0.25	170.5	3.8	8.6	10.1	192	2.2	193	0.0	0.0	0.0	1.3	183	48	53.5	24.8
	3A	7.42		289		0.25	181.9		2.1	39.6	86	3.7	145	0.4	0.0	0.8	1.2	121	31	33.9	25.3
	4	7.85		352		0.88	177.9	2.8	3.6	14.4	227	78.0	220	0.0	0.0	13.0	1.1	191	50	55.9	24.1
	5	8.00		336		1.06	178.9	2.1	8.6	14.4	166	14.7	176	0.0	0.0	2.4	1.4	156	41	183.2	23.4
	6																				
	7																				
	8																				
	9	7.80		294		1.00	297.8	3.1	6.4	31.6	150	2.2	163	0.4	0.0	2.4	2.0	136	35	4.5	25.8
	10	7.82		317		3.31	306.8	2.1	7.9	24.5	155	2.8	197	1.6	0.0	4.4	1.0	140	48	27.3	15.5
4/26/75	1																				
	2	6.65	9.0	739	79.2	2.25	209.6	2.3	22.4	145.4	469	368.0	872	0.0	0.0	4.0	1.6	160	43	30.7	100.1
	3	7.85	130.0	372	64.6	1.25	223.8	5.7	15.8	12.1	254	1.9	256	0.0	0.0	3.0	0.8	203	58	60.6	32.0
	3A	7.70	55.0	340	70.1	1.66	523.3	1.3	9.2	49.3	225	8.3	290	0.8	0.0	0.8	1.2	133	47	57.7	28.6
	4	8.05	114.0	404	90.1	2.14	245.0	4.4	19.7	27.7	289	6.7	295	0.0	0.0	9.6	1.7	183	69	74.5	37.7
	5	7.95	98.0	361	88.3	2.43	281.0	3.0	13.2	23.6	260	1.9	212	0.4	0.0	4.4	1.5	160	48	5.1	35.6
	6																				
	7																				
	8																				
	9	7.85	72.0	276	59.2	1.78	319.6	16.4	129.6	31.7		1.4	166	0.8	0.0	2.0	1.3	125	46		19.0
	10	7.80	94.0	302	56.5	1.54	532.5	2.7	26.3	19.1			237	2.0	0.2	3.4	1.4	133	35		19.0
5/3/75	1																				
	2	6.85	9.9	450		1.33	262.1	3.5	250.3	39.7	364	31.3	368				0.0		59	279.4	86.5
	3	7.80	100.0	403		1.03	374.6	2.9	36.7	21.1	305	19.1	280	1.8	0.0	19.4	0.4	203	46	483.0	37.7
	3A	7.45	48.7	375		0.42	744.6	1.3	6.8	44.8	263	5.5		4.0	0.0	0.4	0.5	140	34	97.9	38.3
	4	7.90	96.4	407		0.60	394.5	2.5	7.5	26.7	246	2.3	229	6.8	0.0	6.4	0.6	187	45	68.1	52.3
	5	7.95	83.8	369		0.48	473.7	1.9	5.4	26.2	212	2.4	222	3.2	0.0	2.4	0.6	160	41	44.7	42.4
	6	7.48	31.5	243		0.42	439.6	2.9	12.2	2.0	132	2.0	118	4.4	0.0	18.8	2.9	109	36	99.3	52.9
	7	7.95	71.2	347		0.48	386.4	1.9	4.1	22.6	163	2.3	155	4.0	0.2	2.4		136	39	17.7	38.3
	8	7.70	36.9	191		0.60	356.2	2.9	5.4	2.0	30	1.6	63	4.6	0.0	4.8	0.0	94	28	56.7	21.9
	9	7.85	63.1	268		0.84	469.2	6.3	14.3	24.6	107	1.4	163	15.0	0.0	1.3	0.5	117	33	29.8	12.0
	10	7.80	89.2	319		0.54	629.1	3.2	16.3	21.6	111	0.8	155	9.8	0.0	4.4	0.3	148	37		15.5

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
5/10/75	1																				
	2	7.05	14.3	1418	144.6	2.98	231.0	0.3		44.7	282	25.7	319	8.0		0.0	1.3	131	39	404.9	99.5
	3	7.85	81.0	645	97.7	1.75	373.3	0.3	5.3	36.1	203	17.2	214	1.8	0.0	1.6	0.7	153	42	114.8	38.5
	3A	7.62	57.1	400	63.6	1.04	512.2	0.3	3.3	35.3	174	3.3	220	1.0	0.0	0.4	0.9	122	37	29.6	45.3
	4	8.05	101.0	407	69.2	1.10		1.0	2.0	32.3	209	12.6	241	3.6	0.0	1.4	0.4	192	35	205.6	45.8
	5	8.00	90.5	388	63.6	1.30		2.6	19.1	31.6	200	1.5	254	1.6	0.0	6.0	1.1	148	37	117.9	38.0
	6																				
	7																				
	8																				
	9	7.95	66.7	284	65.2	1.04	358.8	3.6	16.5	26.4		1.8	192	11.0	4.6	5.6	1.3		32	96.9	18.3
	10	8.02	93.3	312		0.97	541.4	2.6	4.6	19.4	192	0.1	214	11.3	0.4	11.2	0.8	109	37		25.4
5/17/75	1																				
	2	7.38	29.8	248	63.8	1.55	368.0	6.1	18.0	27.4	141	51.6	211		0.0	0.0	1.6	80	24	410.3	33.4
	3	7.60	61.4	356	53.5	2.12		10.9	11.1	36.3	213	32.8	252	0.0		3.2	0.4		37	765.5	
	3A	7.45	49.3	408	61.2	1.09	643.1	3.7	5.6	54.7	229	13.2	245	1.0	0.0	2.6	0.9	135	34	141.3	74.5
	4	7.75	71.6	377	52.7	1.15	482.6	3.1	3.7	43.7	246	18.8	273	2.7	0.3		0.6	141	38	477.7	35.6
	5	7.78	56.7	317	52.7	1.09	566.0	2.4	5.0	38.3	194	19.1	222	3.3	0.0	2.3	0.8	121	34	255.4	30.6
	6																				
	7																				
	8																				
	9	7.65	43.7	224	63.8	1.09	501.4	3.4	6.2	21.9	157	13.3	145	5.0	2.2	4.0	1.1	84	26	99.2	41.4
	10	7.70	46.5	214	57.0	1.43	642.8	3.1		18.9	139	15.7	143	0.3	2.8	12.7	1.5	84	26	57.0	18.6
5/24/75	1																				
	2	7.70	90.8	263	36.0	0.61	271.2	1.7	2.5	7.6	67	4.3	153	4.0	0.0	4.0	0.5	127	30	425.3	26.8
	3	7.75	102.7	342	44.2	0.54	365.5	1.0	3.1	22.7	167	1.1	148	6.0	0.0	36.0	0.5	148	34	219.9	25.1
	3A	7.48	66.0	346	48.7	0.82	575.6		2.5	40.7	99	1.3	125	11.0	0.0	3.0	1.0	129	34	51.4	30.8
	4	7.80	99.5	360	36.0	0.54		0.3	3.1	24.5	152	14.7	141	2.0	0.0	0.0	0.6	152	34	534.9	41.0
	5	7.68	73.5	353	64.2	0.54	499.5	1.0	3.1	36.4	141	7.6	96	8.0	0.0	2.5		124	34	280.1	23.9
	6																				
	7																				
	8																				
	9	7.70	83.2	263	46.9	0.54		2.3	5.6	28.8	88	3.3	104	34.0	0.4	4.0	0.5	92	27	69.9	18.2
	10	7.74	61.6	269	103.3	0.61	288.1	2.0	39.6	25.8	18	2.9	222	31.0	1.2	10.0	0.7	96	28	63.7	19.4

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
5/31/75	1																				
	2	7.80	68.9	206	58.1	1.37	196.3	3.3	5.7	6.2	132	21.0	180	3.0	0.0	1.5	0.7	106	26	997.5	21.9
	3	7.88	79.6	266	47.6	0.75	191.4	3.3	12.0	17.0	188	15.6	202	4.5	0.0	5.0	0.5	104	32	362.0	18.3
	3A	7.45	49.5	342	93.3	0.62	364.4	2.7	7.6	43.5	235	6.3	257	3.5	0.0	1.0	0.6	126	35	59.5	43.8
	4	7.90	75.7	298	85.7	0.69	204.1	2.7	8.2	19.5	163	22.8	220	13.0	0.0	1.0	0.4	118	33	375.5	55.5
	5	7.78	58.3	258	55.2	0.69	414.7	2.0	5.0	24.4	121	15.7	201	8.5	0.7	4.0	0.5	104	18	245.4	18.3
	6	7.55	22.3	126	28.6	0.62	183.7	5.7	8.8	3.2	100	3.3	119	22.0	0.0	2.0	0.4	86	17		24.2
	7	7.82	50.5	219	20.0	0.69	242.7	3.0	5.7	18.9	111	11.7	171	14.0	0.0	3.0	0.4	82	18	147.9	15.3
	8																				
	9	7.85	44.7	199	16.2	0.69	172.6	3.0	4.4	17.0	84	9.6		13.5	0.3	1.0	0.7	72	21	124.5	15.0
	10	7.78	46.6	178	21.0	0.69	183.7	1.7	5.7	16.5	97	9.9	144	23.5	0.3	0.5	0.6	74	24	100.6	14.4
6/10/75	1																				
	2	7.60	84.7	210	66.8	1.58	245.6	4.7	7.5	9.4	50	24.7	279	6.5	0.8	2.7	1.9	110	32		18.0
	3	7.70	84.7	240	61.0	0.63	212.3	4.3	7.5	4.6	78	21.9	39	4.5	0.2	3.3	1.0	103	30		18.0
	3A	7.10	49.7	285	33.4	0.57	420.7	1.4	4.4	24.9	48	15.1	80	3.0	0.0	0.7	0.9	103	30		26.4
	4	7.70	77.4	219	24.9	0.50	306.0	2.9	3.1	9.9	20	29.8	77	1.5	0.4	1.0	0.2	110			14.9
	5	7.55	59.9	203	14.4	0.57	281.7	2.9	5.7	12.3	104	32.9	62	2.5	0.6	2.3	1.1	82			16.9
	6																				
	7	7.55	47.9	164	11.5	0.38	231.0	2.2	5.7	9.9	57	27.3	34	8.5	0.6	2.7	0.8	73	21		17.7
	8																				
	9	7.50	40.5	158	11.5	0.50	182.0	2.5	5.0	10.6	74	31.5	53	7.5	0.6	5.0	1.0	62	18		12.7
	10	7.55	41.4	147	8.7	0.38	224.0	3.2		10.1	84	31.7	39	4.0	0.8	4.7	0.2	62	19		19.4
6/14/75	1																				
	2	7.30	69.8	167	124.8	1.56	247.4	4.3	8.6	3.6		71.9	148		0.0	3.0	1.0	84	29		5.9
	3	7.30	70.8	191	48.9	1.41	307.7	3.6	9.3	5.6	73	80.7	165		0.6	5.7	0.9	88	26		8.8
	3A	6.90	42.5	268	52.6	0.99	503.6	0.7	5.7	20.8	122	7.4	138	4.0	0.0	0.3		97	27		28.7
	4	7.30	67.0	193	37.8	0.99	330.6	2.8	7.2	6.8	95	61.9	155		0.4	6.0	0.7	86	25		11.1
	5	7.20	51.9	161	58.1	1.70	292.5	3.2	9.3	6.0	37	56.4	140		1.4	3.0	1.6	66	20		10.5
	6																				
	7	7.00	42.5	139	34.1	1.13	308.0	3.6	11.5	5.6	35	38.7	91		0.2	4.0	0.5	57	18		9.4
	8																				
	9	7.15	34.9	131	26.7	1.56	275.0	5.0	12.9	6.5	24	36.0	72		0.2	6.7	1.1	50	16		8.8
	10	7.40	35.9	126	52.6	1.98	266.3	3.6	9.3	6.0	39	43.3	108		0.6	3.3	0.2		16		98.9

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
6/21/75	1																				
	2		89.4	249	29.2	0.61	217.0	8.0	11.0	4.1	195	9.0	161	43.0	0.0	8.5	1.0	102	29	63.5	8.5
	3		87.5	256	18.3	0.61	260.5	3.8	6.9		201	5.8	147	6.0	0.0	3.5	1.0	110	30	78.0	9.7
	3A		55.8	290		0.43	403.2	2.6	5.5	29.4	205	2.4	197	6.0	0.3	0.0	0.7	94	27	11.3	23.6
	4		82.7	258	33.2	0.55	231.0	3.8	10.3	6.3	198	8.1	183	4.0	1.0	4.5		103	27	111.9	12.8
	5		64.4	215	19.3	0.49	269.4	4.5	9.0	6.3	178	6.1	131	8.0	1.0	3.5	1.7	80	27	69.8	9.7
	6																				
	7		51.9	190	21.3	0.55	243.0	2.9	5.5	5.8	151	3.2	84	13.0	0.3	2.5	1.1	75	23	34.6	10.2
	8																				
	9		42.3	170	20.3	0.55	241.6	3.8	5.5	8.0	155	5.8	133	20.0	6.7	38.0		70	19	20.8	8.2
	10		42.3	172	39.1	0.49	221.8	3.2	5.5	9.1	130	7.8	111	34.0	9.0	28.0	1.9	59	19		9.0
6/28/75	1	7.80	51.9	120	42.9	0.91	111.3	7.3	9.7	1.3	50	4.1	53	17.0	1.0	1.3	0.4	53	16	9.2	1.8
	2	7.78	71.3	177	33.9	0.49	175.1	3.3	5.5	2.8	62	8.8	39	22.0	2.0	2.7	2.6	80	24	64.4	
	3	7.90	70.4	178	48.2	0.07	204.8	1.8	6.9	3.9	88	9.2	91	6.5		2.7	0.4	88	22	97.7	3.6
	3A																				
	4	7.92	69.4	187	38.4	0.56	228.7	3.7	15.9	3.9	101	13.9	98	3.0	1.2	1.0	0.8	88	24	120.1	8.2
	5			150	33.9	0.42	233.7	2.2	8.3	4.4		8.2	76	7.0	0.6	4.3	0.2	69	19	92.0	6.7
	6																				
	7	7.80	44.4	132	35.7	0.56	214.1	3.3	7.6	3.9	86	14.7		14.5	0.0	6.3	0.2	61	17	67.2	7.4
	8																				
	9	7.72	38.0	122	42.9	0.77	218.8	0.7	5.5	5.4	54	10.6	73	12.5	0.3	4.5	0.6	55	16	51.1	8.2
	10	7.68	37.0	123	44.6	0.49	199.5	2.6	6.9	5.9		9.3	80	14.0	0.0	2.5		51	14	57.5	6.4
7/5/75	1	7.82	42.8	110	19.5	0.76	214.7	6.2		0.5	60	13.7	14	3.5	0.4	8.0		48	14		1.8
	2	7.94	69.4	162	23.5	0.62	218.9	5.8			82	8.8	41	0.0	0.2	4.7	1.4	80	22		3.8
	3	7.85	69.6	172	18.1	0.55	255.6	5.5		1.0	88	24.1	64	0.5	2.2	7.0	0.2	80	18		4.6
	3A																				
	4	8.05	61.5	169	25.5	0.55	231.2	4.5		1.5	88	35.3	97	2.0	0.4	7.0	3.4	80	21		6.7
	5	7.85	52.1	140	29.6	0.69	227.0	4.1		2.5	67	41.0	107	1.5	2.0	5.3	1.6	60	18		5.6
	6																				
	7	7.78	47.9	125	30.3	0.69	153.8	6.2		2.0	70	15.1	104	8.0	31.6	15.3		72	15		6.7
	8																				
	9	7.72	39.2	103	25.5	0.62	223.0	5.8		3.0	61	44.7	61	2.0	1.2	13.7	3.0	44	12		2.6
	10	7.68	26.8	103	18.8	0.69	235.1	6.2		3.0	55	75.5	41	1.0	9.0	26.3	0.0	48	14		6.1

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	$SO_4^=$ mg/l
7/12/75	1	8.22	64.8	133	123.5	1.31	131.8	9.1	21.3	2.9	76	15.6	152		1.2	6.7	0.6	61		
	2	7.82	73.2	157	69.1	1.24	166.1	4.4	6.7	1.3	102	29.1	200		0.2	2.9	0.6	83		
	3	8.00	74.1	158	53.3	0.79	174.2	9.4	10.0	6.1	132	0.5	200		0.6	5.3	1.1	80	19	
	3A																			
	4	7.98	72.2	180	53.3	1.37	181.2	6.7	8.7	4.5	162	22.2	168		1.0	8.3	1.2	81		
	5	7.90	57.4	146	49.8	1.37	173.6	7.0	14.0	8.2	130	26.1	160		4.8	17.7	0.8	66	19	
	6																			
	7	7.80	46.3	130	42.8	1.18	181.4	6.0	10.0	2.4	141	57.8	161	7.5	1.7	17.0	1.2	56	16	
	8																			
	9	7.85	37.0	105	58.6	0.65	195.3	5.7	10.0	11.3	104	15.4	142		0.4	17.3	0.5	51	13	
	10	7.78	37.0	109	43.6	1.18	195.3	6.7	8.0	0.8	37	21.2	115	21.5	1.8	21.0	1.2	44		
7/19/75	1	8.15	68.6	127	58.1	4.08	60.0	6.0	14.0		105	5.4	75	16.7	0.0	26.5		71	17	6.9
	2	7.85	75.1	305	32.4	0.90	98.4	3.5	4.7		92	6.5	100	8.7	0.6	11.5	0.2	101	31	11.5
	3	8.02	57.1	154	26.7	0.90	98.4	2.5	16.7		109	8.7	97	6.0	0.6	9.0	0.6	105	23	6.9
	3A	7.61	44.1	121	21.0	1.11	133.7	2.2	10.0		140	1.4	128	11.3	0.2	11.3	0.7	92	14	8.1
	4	8.00	60.4	148	30.3	0.58	95.2	2.5	10.0		105	8.2	112	4.7	0.4	9.8		88	28	8.4
	5	7.98	49.8	131	32.4	0.42	67.0	2.2	10.0		67	7.1	98	4.0	0.2	22.0	0.5		22	10.4
	6																			
	7	7.87	44.1	115	26.7	0.48	91.7	2.2	10.7		146	6.7	83	6.7	1.4	24.0	0.2	105	12	15.0
	8																			
	9	7.75	44.1	102	25.3	1.91	104.6	4.1	13.3		141	5.6	65	8.7	2.2	43.5		75	19	1.2
	10	8.25	58.0	95	28.1	1.01	116.1	2.2	6.0		144	4.8	64	17.3	6.0	70.0	0.8	50	16	10.4
7/26/75	1	8.15	74.2	186	52.2	1.27	43.9	9.3		1.3	86	15.9	42	3.3	0.2	15.0	0.5	91	22	
	2	7.80	83.8	215	37.4	1.41	77.6	5.3		1.3	92	6.4	68	2.7	0.0	6.3	0.6	113	25	
	3	8.05	82.1	231	29.6	0.99	108.1	8.7		2.3		6.6	82	7.3	0.4	7.8	0.6	113	24	
	3A	7.52	53.3	199	31.3	1.06	145.6	6.7		7.5		2.1	72	3.2	0.0	5.8	0.7	74	21	
	4	8.10	83.8	247	28.7	1.34	111.0	6.7		2.8	112	5.1	78	1.2	0.0	5.5	0.5	109	24	
	5	8.00	66.4	207	72.2	1.27	103.9	6.7		2.5	81	5.5	54	1.6	0.2	16.5	0.3	93	23	
	6																			
	7	7.92	52.4	180	20.0	1.20	82.2	6.3		3.0	57	4.5	32	28.0	35.6	23.5	0.4	83	20	
	8																			
	9	7.75	38.4	138	40.0	0.92	136.8	5.0		3.0		3.5	20	6.4	1.2	20.5	0.6	64		
	10	7.85	40.2	145	24.4	1.34	107.4	6.0		4.3		2.3		2.7	1.3	28.0	0.6	64		

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
8/2/75	1	8.09	76.6	195	36.9	0.71	31.5	6.6	7.8	2.1	76	4.1	66	14.7	2.4	18.0	1.1	80	24		
	2	8.05	79.2	297	24.8	0.42	67.9	5.3	9.3	3.9	82	2.5		2.7	1.8	9.7	0.7	101	33		
	3	8.15	89.4	253	26.3	0.53	81.8	5.3	10.7	4.3	101	5.3	130	1.7	0.0	3.3	1.3	99	28		
	3A	7.55	42.6	189	21.8	0.24	182.5	6.2		10.8	79	0.5	91	26.0	0.4	3.0	1.2	72	21		
	4	7.95	63.0	241	36.2	0.18	118.3	3.3	4.3	4.5	117	3.1	139	4.3		4.3	0.7	101	30		
	5	7.89	53.6	210	28.6	0.42	110.0	3.0	5.0	5.1	76	2.2	73	2.0	0.4	5.5	1.9	85	27		
	6																				
	7	7.75	38.3	160	24.8	0.30	102.1	3.0	3.6	5.1	67	0.8	71	6.0	0.5	8.0	3.0	70	24		
	8																				
	9	7.79	40.0	145	29.4	0.42	122.1	3.6	10.7	6.1	44	0.8	52	1.7	0.2	11.0	3.0	58	18		
	10			226	21.8	0.36	160.3	3.3	4.3	7.7	2	0.9	57	3.7	0.6	22.0	3.2	56	18		
8/9/75	1	8.35	86.8	223		2.94	6.4	15.1			123	2.3	139	35.5	1.8	24.0	0.3	96	26	14.6	6.3
	2	8.08	89.4	293		1.59	47.3	6.7		3.5	140	1.2	100	4.0	1.8	16.0	0.4	108	31	289.0	24.3
	3	8.30	90.2	286		1.59	71.0	5.7		5.0	132	2.0	172	23.0	0.0	11.8	1.0	140	30	187.8	15.6
	3A	7.70	52.8	226		0.59	171.2	6.0		12.4	104	0.5	117	13.0	0.0	9.0	0.5	76	23	23.8	20.1
	4	8.20	87.7	286		0.71	64.2	5.0		5.5	124	1.7	164	5.5	0.6	10.3	0.1	116	33	122.0	20.8
	5	8.12	74.9	257		1.06	86.8	5.4		5.5	126	2.0	149	26.5	1.0	17.5	0.4	120	30	151.2	18.5
	6																				
	7	8.10	57.0	212		1.29	75.1	3.7		4.6	97	0.2	138	5.0	0.8	23.5	0.1	84	23	50.0	16.4
	8																				
	9	7.95	47.7	175		0.59	102.5	9.1		6.7	78	1.5	110	13.0	0.8	28.5	2.1	64	19	62.8	14.2
	10	7.98	45.1	184		1.06	132.6	3.7		8.1	85	0.6	100	8.5	1.2	23.0	0.4	60	21	122.0	15.8

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	Total Col. Enrichment Method cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml
8/20/75	1B	8.00		272	43.5	0.24	70.7	3.7	6.3	1.1	58.6	1.2	3.0
	1	7.95		220	38.4	0.43	14.6	5.3	6.3	0.8	135.7	3.0	19.0
	2	7.65		286	53.8	0.37	65.4	3.1	23.1	2.8	32.7	0.4	6.3
	3												
	4	7.85		287	52.9	0.61	66.7	4.3	11.3	4.6	32.0	0.0	8.0
	5	7.90		263	56.4	0.06	92.5	6.2	8.8	4.8	62.9	1.0	10.8
	6												
	7												
	8												
	9	7.85		176	78.6	0.30	99.3	6.5	10.6	6.3	161.4	0.8	34.0
	10												
8/21/75	1B	8.29		262		0.43	58.5	6.2	10.6	0.6	91.4	0.4	2.5
	1	8.20		214		0.37	14.4	9.0	15.6	3.3	127.1	4.8	17.0
	2	8.40		281		0.67	61.7	7.5	10.0	3.1	28.5	0.2	4.0
	3												
	4	8.36		290		0.55	92.6	6.2	9.4	4.8	61.0	4.6	10.5
	5	8.40		249		0.55	77.4	5.6	10.0	4.8	138.6	7.8	20.0
	6												
	7												
	8												
	9	8.40		178		0.55	81.7	11.2	12.5	5.8	101.4	0.2	37.5
	10												
8/22/75	1B	8.08	89.4	256	29.0	0.18	67.4	5.6	15.6	0.3	48.0	1.4	9.0
	1	8.35	86.8	209	33.3	0.30	14.4	5.6	16.3	0.8	154.0	1.4	18.0
	2	8.30	90.2	275	34.1	0.43	59.3	6.2	15.0	3.3	108.0	1.6	8.0
	3												
	4	7.70		270	35.9	0.43	101.3	5.3	12.5	4.3	46.0	0.9	10.3
	5	8.20	87.7	246	31.6	0.37	94.2	5.3	16.3	4.8	68.0	2.0	13.8
	6												
	7												
	8												
	9	8.12	74.9	172	33.3	0.43	98.3	3.1	13.8	4.8	175.0	2.0	20.5
	10												

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	Total Col. Enrichment Method cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml
8/23/75	1B	8.50		264	31.6	0.12	71.6	3.1	7.6	10.6	37.1	0.4	4.5
	1	8.49		219	33.3	0.12	23.6	8.7	14.0	1.0	105.7	1.6	12.0
	2	8.32		274	31.6	0.36	72.2	3.1	7.6	4.1	72.0	3.6	9.0
	3												
	4	8.41		272	31.6	0.42	116.3	2.2	7.6	4.6	33.3	0.2	11.7
	5	8.27		248	31.6	0.24	106.0	1.6	5.7	5.1	11.4	1.0	51.7
	6												
	7												
	8												
	9	8.27		174	33.3	0.30	112.2	0.3	2.5	14.2	137.1	0.6	58.0
	10												
8/24/75	1B	8.80		249	33.6	0.12	63.5	4.3	5.1	1.0	50.0	0.6	5.5
	1	8.68		210	40.1	0.30	24.3	5.6	9.5	0.5	68.0	0.2	25.0
	2	8.48		268	33.6	0.12	75.3	4.7	8.3	3.1	55.3	0.0	5.6
	3												
	4	8.70		273	36.0	0.12	124.9	3.1	6.3	5.1	13.0	0.0	6.8
	5	8.60		255	36.0	0.24	118.0	3.7	5.7	5.6	32.0	0.6	16.0
	6												
	7												
	8												
	9	8.32		167	40.9	0.30	131.5	5.3	9.5	5.6	124.0	0.4	106.0
	10												
8/25/75	1B	8.70		202	34.4	0.12	120.6	5.3	6.5	1.0	1.4	0.8	7.6
	1	8.55		244	34.4	0.36	19.8	5.6	7.2	1.5	12.9	0.4	20.5
	2	8.50		268	40.9	0.18	76.5	5.3	9.2	3.6	17.3	0.2	9.7
	3												
	4	8.60		269	31.1	0.18	122.6	3.4	5.9	4.6	4.7	0.4	6.8
	5	8.42		241	33.6	0.30	103.4	3.7	7.2	5.6	34.7	0.2	18.8
	6												
	7												
	8												
	9	8.30		170	31.9	0.42	106.6	6.2	11.1	6.6	61.4	0.6	39.5
	10												

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	Total Col. Enrichment Method cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml
8/26/75	1B	8.08	89.4	264	39.6	0.50	89.8	2.8			8.0	0.0	6.5
	1	8.35	86.8	195	46.4	0.37	29.7	5.0		0.5	38.0	0.0	17.6
	2	8.30	90.2	253	42.1	0.44	101.6	3.1		3.2	12.0	0.0	6.0
	3												
	4	7.70		261	38.7	0.37	148.3	2.5		4.8	5.0	0.2	5.0
	5	8.20	87.7	239	37.9	0.50	132.2	2.2		5.3	19.5	0.4	16.7
	6												
	7												
	8												
	9	8.12	74.9	162	45.6	0.50	174.6	2.8		5.8	30.0	0.0	46.5
	10												
8/27/75	1B	8.51		245	29.3	0.30	68.9	7.2	9.8	0.5	18.7	1.2	15.0
	1	8.45		209	50.5	0.12	18.3	339.6	343.6	2.1	45.0	0.6	27.3
	2	8.25		281	31.8	0.30	96.7	7.8	17.2	3.2	10.0	0.0	5.0
	3												
	4	8.49		278	50.5	0.36	119.9	5.0		4.8	10.5	0.8	10.0
	5	8.41		247	36.9	0.36	124.7	2.8	4.9	5.3	36.0	0.4	27.0
	6												
	7												
	8												
	9	8.30		173	80.1	0.47	96.8	4.0	6.1	6.9	120.0	0.6	72.0
	10												
8/30/75	1B	8.65		225	30.2	0.42	58.1	83.7	95.6	0.7	31.3	0.4	8.0
	1	8.70		181	26.9	0.18	20.9	6.1	12.5	0.7	24.0	0.0	27.3
	2	8.20		225	27.7	0.30	86.4	4.9	6.9	2.7	5.6	0.8	10.5
	3												
	4	8.50		242	17.9	0.54	156.5	30.7	36.9	6.6	10.1	0.0	7.0
	5	8.50		218	21.2	0.30	131.3	4.0	7.5	0.5	33.6	0.0	38.8
	6												
	7												
	8												
	9	8.45		152	22.8	0.24	140.6	16.3	21.3	13.3	100.0	1.0	82.0
	10												

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	Total Col. Enrichment Method cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml
8/31/75	1B	7.40		192	18.8	0.18	52.5	4.3	5.0	1.3	76.0	0.6	10.5
	1	7.40		227	14.0	0.36	25.6	5.2	5.6		102.0	0.4	38.8
	2	7.10		241	23.6	0.06	84.2	4.9		4.0	11.6	0.0	23.5
	3												
	4	7.35		260	27.7	0.12	123.9	2.8	5.0	7.5	15.5	0.2	11.3
	5	7.35		234	22.8	0.30	118.1	3.7	4.4	5.5	33.2	0.4	36.0
	6												
	7												
	8												
	9	7.20		161	25.2	0.30	125.7	4.9	5.6	7.5	97.5	1.0	175.0
	10												
9/1/75	1B	8.65		202	14.4	0.26	49.2	5.1	6.0	1.0	40.0	17.4	130.0
	1	8.60		235	9.7	0.58	18.3	5.1	7.7	1.5	90.0	0.0	34.8
	2	8.20		249	14.4	0.26	91.5	5.1	7.7	3.6	5.2	0.0	8.4
	3												
	4	8.45		271	12.1	0.26	137.0	3.8	6.0	6.2	11.2	1.0	18.0
	5	8.40		241	12.8	0.39	136.9	3.8	5.4	6.2	22.0	1.0	30.0
	6												
	7												
	8												
	9	8.20		163	9.7	0.52	152.4	5.4	7.1	6.2	112.0	0.6	139.8
	10												
9/2/75	1B	8.00		248	24.0	0.53	46.2	2.5	4.8	0.5	10.0	1.2	31.2
	1	8.20		190	33.3	0.93	24.5	5.7	7.1	0.5	36.0	0.6	23.0
	2	8.10		239	24.0	0.67	82.7	3.2	6.0	3.1	10.0	0.0	9.0
	3												
	4	8.00		254	9.7	0.53	139.0	2.8	3.6	5.2	2.5	0.0	12.7
	5	8.15		237	15.6	0.67	124.4	2.8	3.6	5.2	25.0	0.2	17.0
	6												
	7												
	8												
	9	8.20		166	13.9	0.73	149.7	2.8	4.2	5.7	12.0	0.8	74.0
	10												

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	Total Col. Enrichment Method cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml
9/3/75	1B			308	14.7	0.73	50.7	6.0	10.7	2.0	88.0	0.6	21.2
	1			239	17.9	0.59	26.3	2.2	13.8	5.0	70.4	1.4	68.0
	2			323	15.5	0.59	97.5	3.8	9.4	3.5	15.5	0.0	12.0
	3												
	4			331	12.3	0.53	153.2	3.1	10.1	5.5	8.5	0.2	30.3
	5			297	11.5	0.66	141.4	2.8	15.1	5.5	22.0	0.2	57.0
	6												
	7												
	8												
	9			192	14.7	0.66	151.1	2.8	9.4	6.0	128.0	0.8	108.6
	10												
9/4/75	1B			294	15.8	0.58	47.8	2.3	9.4	2.8	8.3	1.4	21.2
	1			235	30.9	0.91	23.3	2.6	14.5	14.7	4.3	0.0	25.5
	2			324	24.2	0.84	92.4	3.2	9.4	7.9	0.0	0.0	8.0
	3												
	4			288	15.8	1.43	153.3	2.9	18.9	7.9	1.4	0.2	15.0
	5			290	20.8	0.65	122.3	2.6	11.3	6.9	10.3	0.4	38.0
	6												
	7												
	8												
	9			194	15.8	0.65	137.1	2.9	10.1	8.9	28.0	0.4	100.0
	10												
9/5/75	1B	8.30		301	18.0	0.19	50.8	1.6	5.7	0.7	107.0	3.8	34.0
	1	8.55		251	22.2	0.50	19.1	2.2	8.8		66.0	0.2	37.5
	2	8.00		327	23.0	0.57	90.4	2.8	7.5	4.3	10.0	0.0	7.7
	3												
	4	8.60		329	19.7	0.32	160.5	2.5	6.3	8.7	13.2	1.4	18.0
	5	8.55		300	22.2	0.38	146.7	2.5	9.4	6.3	36.0	0.8	44.0
	6												
	7												
	8												
	9	8.50		195	22.2	0.32	154.6	1.9	10.7	7.4	58.0	0.8	122.0
	10												

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	Total Col. Enrichment Method cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml
9/6/75	1B	7.50		306	23.5	0.38	43.1	1.9	42.1	1.0	41.0	1.6	55.2
	1	7.50		246	71.4	0.57	19.9	2.5	10.1	2.5	112.0	0.8	97.0
	2	7.35		360	21.8	0.57	92.8	2.5	8.8		12.5	0.3	22.4
	3												
	4	7.45		336	8.8	0.44	146.6	2.5	5.7	6.6	12.6	0.2	16.0
	5	7.45		308	15.3	0.57	126.9	2.5	2.5	6.6	32.0	0.0	38.6
	6												
	7												
	8												
	9	7.45		199	10.4	0.50	141.5	2.2	8.8	7.1	104.0	0.4	207.1
	10												

Table F-3. Continued.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l	Total Col. cts/100 ml	Fecal Col. cts/100 ml	Fecal Strep cts/100 ml	BOD_5 mg/l	Hardness mg/l	Ca^{++} mg/l	Iron µg/l	$SO_4^=$ mg/l
11/9/75	1B	8.03	162.5	276	33.3	0.59	49.0	2.1	2.5	0.5				15.0	0.0	0.4	1.2	145	36	104.5	9.2
	1	8.00	91.5	190	62.8	0.59	30.6	2.1	4.4	1.5				19.0	0.0	4.8	1.1	117	26	30.1	28.6
	2	7.60	122.0	321	43.1	0.85	82.0	2.5	3.8	4.1				4.5	0.0	1.2	0.6	176	47	2797.0	66.5
	3													3.7	0.0	6.3					
	3A	7.50	63.0	220	38.2	0.53	209.1	8.9	8.8	12.8				10.5	0.0	1.8	1.5	105	26	208.3	48.3
	4	7.82	116.5	310	40.7	0.48	138.3	3.1	2.5	9.7				15.5	0.0	2.0	1.2	156	41	97.7	59.1
	5	7.92	101.5	284	30.0	0.64	134.7	5.8	5.7	8.7				18.0	0.0	11.6	0.8	145	38	78.2	53.2
	6																				
	7	7.70	88.0	258	33.3	0.59	139.0	1.8	5.7	8.7				20.0	0.0	7.6	0.4	125	36	91.7	48.8
	8	7.50	42.5	160	25.9	0.37	106.5	2.8	5.7	3.6				12.8	0.0	26.6	0.5	71	26	12.8	36.5
	9	7.60	72.5	213	31.6	0.59	154.6	2.5	2.5	11.7				60.0	0.0	12.0	0.4	103	30	24.1	28.0
	10	7.70	100.5	302	30.0	0.96	467.7	6.4	7.6	25.0				137.0	0.4	186.0	0.7	133	42	18.0	27.7

Appendix G

Results of Diurnal Study

Table G-1. Diurnal study results, Site 1A.

Date	Sampling Time	Water Temp. °C	Bacterial Results Counts/100 ml		
			TC	FC	FS
Friday 8/30/74	3:35 p.m.	14.0	32.5	28.0	49.2
	6:55 p.m.	8.5	43.8	64.7	73.2
	11:40 p.m.	5.0	25.0	6.0	25.2
Saturday 8/31/74	3:40 a.m.	4.0	0	8.4	26.4
	8:20 a.m.	3.5	4.7	4.4	34.8
	11:30 a.m.	9.5	42.0	2.0	121.0
	2:50 p.m.	14.5	0	1.5	116.4
	6:55 p.m.	10.0	4.0	1.7	75.0
	11:07 p.m.	4.5	27.7	4.3	32.8
Sunday 9/1/74	2:45 a.m.	--	14.2	5.9	20.0
	10:10 a.m.	--	40.0	12.6	30.5
	3:17 p.m.	16.0	24.0	2.8	85.0
	7:48 p.m.	7.5	--	--	25.7
	11:15 p.m.	5.0	6.7	0.4	23.0
Monday 9/2/74	2:30 a.m.	4.5	11.3	7.2	62.5
	6:45 a.m.	2.0	26.7	11.0	30.4
	10:30 a.m.	6.0	25.7	1.4	9.5
	3:09 p.m.	15.0	128.0	80.0	--
	6:40 p.m.	8.5	29.2	12.5	76.0
	10:30 p.m.	3.0	26.3	2.4	34.0
Tuesday 9/3/74	4:46 a.m.	1.0	4.0	4.6	14.3
	10:55 a.m.	7.5	11.0	0.6	40.8

Table G-2. Diurnal study results, Site 1B.

Date	Sampling Time	Water Temp. °C	Bacterial Results Counts/100 ml		
			TC	FC	FS
Friday 8/30/74	3:35 p.m.	12.0	4.4	3.1	22.4
	7:03 p.m.	8.0	78.0	3.0	29.6
	11:45 p.m.	4.5	13.8	2.3	30.0
Saturday 8/31/74	3:50 a.m.	4.0	2.2	2.0	27.6
	8:15 a.m.	3.5	4.0	3.1	14.0
	11:25 a.m.	9.0	21.6	3.8	7.3
	2:55 p.m.	12.5	5.4	3.3	35.2
	6:50 p.m.	9.0	6.8	2.8	39.6
	11:02 p.m.	5.0	9.0	1.6	52.0
Sunday 9/1/74	2:50 a.m.	--	8.0	2.8	18.0
	10:14 a.m.	--	25.4	2.0	25.0
	3:11 p.m.	12.0	43.0	1.4	43.0
	7:41 p.m.	7.0	18.7	2.8	25.8
	11:20 p.m.	5.0	7.4	2.6	27.0
Monday 9/2/74	2:20 a.m.	5.0	7.4	1.9	37.3
	6:35 a.m.	3.5	13.4	1.4	26.0
	10:40 a.m.	8.0	6.8	1.5	10.0
	3:00 p.m.	12.0	27.2	1.6	20.3
	6:34 p.m.	8.0	133.0	--	6.3
	10:35 p.m.	4.0	21.4	2.4	32.7
Tuesday 9/3/74	4:42 a.m.	2.5	15.0	3.8	13.0
	11:00 a.m.	7.0	15.0	3.1	59.0

Table G-3. Diurnal study results, Site 1.

Date	Sampling Time	Water Temp. °C	Bacterial Results Counts/100 ml		
			TC	FC	FS
Friday 8/30/74	2:07 p.m.	14.0	1.4	0.4	91.0
	7:18 p.m.	10.5	9.6	2.5	111.0
Saturday 8/31/74	12:10 a.m.	7.0	8.4	5.7	62.0
	4:10 a.m.	7.0	4.1	6.7	43.6
	8:05 a.m.	5.0	4.0	8.6	47.6
	11:08 a.m.	7.0	4.3	3.8	107.0
	3:10 p.m.	13.0	1.6	1.9	146.4
	6:35 p.m.	11.5	0.6	2.2	65.2
	10:53 p.m.	8.0	--	4.5	--
Sunday 9/1/74	3:10 a.m.	--	5.4	3.4	7.6
	10:26 a.m.	--	35.5	2.6	53.0
	2:54 p.m.	13.0	61.3	1.1	51.5
	7:22 p.m.	10.0	12.7	4.0	53.0
	11:35 p.m.	9.0	10.0	2.4	23.0
Monday 9/2/74	2:05 a.m.	7.0	8.5	3.2	99.0
	6:20 a.m.	5.0	24.9	3.5	40.5
	11:00 a.m.	7.0	18.1	1.0	31.0
	2:45 p.m.	12.0	41.0	0.7	37.0
	6:20 p.m.	10.5	12.7	--	148.0
	10:55 p.m.	6.0	50.5	28.5	50.0
Tuesday 9/3/74	4:23 a.m.	3.0	11.6	4.0	--
	11:15 a.m.	5.5	9.1	0.3	28.7

Table G-4. Diurnal study results, Site 4.

Date	Sampling Time	Water Temp. °C	Bacterial Results Counts/100 ml		
			TC	FC	FS
Friday 8/30/74	2:57 p.m.	10.0	0.4	0.5	21.6
	7:26 p.m.	8.5	5.1	1.0	22.7
Saturday 8/31/74	12:20 a.m.	7.0	6.6	1.0	22.5
	4:20 a.m.	6.0	5.5	0.5	4.8
	7:55 a.m.	5.0	2.2	0.5	7.4
	10:58 a.m.	7.0	10.3	--	44.0
	3:20 p.m.	10.0	3.7	1.4	23.8
	6:25 p.m.	9.0	7.1	0.2	--
	10:41 p.m.	7.0	14.6	3.1	21.3
Sunday 9/1/74	3:25 a.m.	--	6.0	0.8	6.4
	10:36 a.m.	--	5.1	0.3	23.7
	2:32 p.m.	10.0	33.1	0	13.7
	7:08 p.m.	8.5	3.1	0.1	16.4
	11:50 p.m.	7.0	2.3	0.8	11.7
Monday 9/2/74	1:55 a.m.	6.0	7.9	0.2	20.8
	6:05 a.m.	5.5	13.9	1.0	10.2
	11:25 a.m.	8.0	5.6	0.1	12.3
	2:34 p.m.	9.5	15.2	0.2	7.8
	6:10 p.m.	9.1	14.3	27.7	18.6
	11:10 p.m.	7.0	19.7	3.8	17.8
Tuesday 9/3/74	4:13 a.m.	5.0	36.0	1.3	3.5
	11:35 a.m.	7.5	2.3	0.2	62.5

Table G-5. Diurnal study results, Site 9.

Date	Sampling Time	Water Temp. °C	Bacterial Results Counts/100 ml		
			TC	FC	FS
Friday 8/30/74	2:45 p.m.	12.0	4.2	0.4	27.1
	7:42 p.m.	13.0	10.8	1.0	68.3
Saturday 8/31/74	12:40 a.m.	10.0	17.0	1.8	93.3
	4:30 a.m.	10.0	22.0	0.7	90.0
	7:40 a.m.	8.0	8.0	2.2	91.0
	10:45 a.m.	9.5	32.0	--	72.0
	3:40 p.m.	12.5	6.8	0.7	43.4
	6:05 p.m.	12.0	13.0	0.7	39.3
	10:24 p.m.	11.0	20.5	2.2	39.0
Sunday 9/1/74	3:45 a.m.	--	36.1	4.5	44.9
	10:50 a.m.	--	47.5	1.4	98.0
	2:15 p.m.	11.0	64.6	0.2	13.0
	6:51 p.m.	12.0	34.0	1.2	35.7
Monday 9/2/74	12:05 a.m.	11.5	12.0	2.7	96.0
	1:40 a.m.	11.0	23.8	1.3	109.3
	5:50 a.m.	10.5	23.6	2.8	60.7
	11:50 a.m.	10.0	14.5	1.2	49.0
	2:15 p.m.	10.5	29.4	1.0	21.3
	5:54 p.m.	11.5	--	--	22.0
	11:25 p.m.	10.0	57.0	2.0	98.0
Tuesday 9/3/74	3:58 a.m.	8.0	27.8	3.0	70.7
	12:30 p.m.	9.0	10.4	0.7	50.0

Appendix H

Results from Supplemental Sites and Precipitation Samples

Table H-1. Little Cottonwood snow samples.

Sample Date	Site	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	Total Col. cts/100 ml	Hardness mg/l	Ca^{++} mg/l	$SO_4^=$ mg/l	Na^+ mg/l	K^+ mg/l
11/9/75	1B	6.60	4.0	6	97.2	0.75	66.0	6.4	6.9	0.5	0.0	2	0	11.4	0.11	0.0
	1	5.40	2.0	9	169.3	0.96	137.5	65.6	94.3	0.5	0.2	2	0	5.4	0.23	0.0
	2	6.60	3.0	1	254.6	2.24	219.7	344.2	383.6	0.5	0.5	4	4	4.3	0.11	0.0
	4	5.80	2.0	1	216.9	1.39	158.4	50.9	44.0	3.1	0.7	4	1	3.5	2.72	0.0
12/31/75	1	7.30	5.8	14	71.9	1.22	70.0	5.8	3.7	7.2		10	3	0.2	1.85	0.22
	2	6.88	4.5	11	67.7	2.07	76.8	10.5	3.7	0.9		12	2	0.2	0.54	0.11
	4	6.90	3.1	11	84.5	2.56	118.7	17.2	6.2	0.7		4	1	0.1	0.44	0.11
	5	6.95	6.3	15	101.3	2.31	146.4	10.5	6.8	2.3				0.2	0.87	0.11
	9	6.45	3.6	12	97.1	1.22	164.2	14.2	15.4	1.3		6	2	0.3	0.44	0.11

Table H-2. Little Cottonwood survey results (special and regular sites).

Site No.	Sample Date	Water Temperature °C	pH	Alkalinity mg/l	Sp. Cond. µmhos/cm	NH_3-N µg/l	NO_2-N µg/l	NO_3-N µg/l	PO_4-P µg/l	Total P µg/l	Cl^- mg/l	TDS mg/l	SS mg/l	TS mg/l
S-1	9/29/74				287			58.7		19.9	1.0			
1A	8/29/74		8.05	154.0	265	62.9	0.55	15.3	2.4	4.6	1.5	158	6.1	99
	9/ 3 /74	7.5	8.35	161.0	272	94.5	0.26	16.6	1.1	15.3	1.3			
	9/14/74	4.0	8.30	152.0	269	36.9	0.13			5.9	1.8	173	2.8	237
	9/21/74	9.5	8.45	162.0	235	6.6	1.18	33.4	7.9	15.7	0.8	33	8.7	48
	9/29/74				267	57.7	1.10		12.9	29.2	1.5	94	2.1	5
	10/ 5 /74	3.0	8.15	119.5	233	66.2	0.71	46.9	1.8	30.9	1.0	163	29.9	164
S-2	9/29/74				325			76.9		23.5	3.1			
S-3	9/29/74				314			17.9		16.4	3.1			
S-4	9/29/74				230			30.8		19.2	4.1			
S-5	9/29/74				236			25.1		20.6				
S-6	9/29/74				393			70.8		22.1	2.0			
S-7	9/29/74				263			122.4		40.6	2.3			
S-8	9/29/74				33			9.0		27.8	2.0			
S-9	9/29/74				159			30.8		37.0	1.5			
S-10	9/29/74				125			28.2		23.5	2.0			
S-11	9/29/74				217			12.5		18.5	2.0			
S-12	10/28/74		8.45	82.0	197			2.2		39.6	0.9			
S-13	10/28/74		8.42	91.0	208			5.3		14.7	2.4			
S-14	10/28/74		8.08	92.0	201			2.2		9.6	2.4			
S-15	10/28/74		8.35	161.0	451			218.2		3.2	1.9			
S-16	10/28/74		8.05	74.0	238			18.9		20.4	2.8			
S-17	10/28/74		8.55	95.0	261			13.8		1.3	2.8			
S-18	10/28/74		8.50	99.0	255			0.8		3.2	1.4			
S-19	10/28/74		7.98	56.0	156					5.1	4.2			
1	10/28/74		8.34	97.0	242			2.1		1.3	1.9			
	12/12/74		7.82	101.0	232			64.0		4.7	1.4			
S-20	10/28/74		8.12	105.0	253			60.1		6.4	1.4			
S-21	10/28/74		8.00	123.0	282			22.5		9.6	3.3			
S-22	10/28/74		7.90	169.0	342			118.8		1.3	1.4			
S-23	9/29/74							112.9		22.1	2.6			
	11/ 9 /75		7.95	165.0	266	39.8	0.48	171.2	5.8	8.8	2.0			
S-24	9/29/74							27.1		29.9	1.8			
S-25	9/29/74							132.3		17.8	1.3			
	12/12/74		8.18	193.0	305			142.4		5.4	1.5			
	11/ 9 /75	4.0	7.75	174.0	282	31.6	0.48	148.1	4.9	5.7	1.0			
S-26	10/28/74		8.24	116.0	438			31.4		3.2	1.9			
S-27	11/ 9 /75		7.40	136.0	299	39.8	0.80	85.7	5.8	7.6	3.6			
S-28	9/29/74							100.3		39.1	2.6			
	12/12/74		5.30	2.0	314			89.7		3.3	2.4			
	11/ 9 /75	5.0	4.00	0.0	306	42.3	0.59	102.3	1.5	3.2	2.0			
S-29	9/21/74					20.0	0.46	93.7	12.4			196	17.4	209
S-30	12/12/74		6.18	4.0	695			83.4		6.0	123.0			

Table H-2. Continued.

S-30	12/12/74		6.18	4.0	695			83.4		6.0	123.0				
	11/ 9 /75	4.5	5.45	2.0	314	44.8	0.37	96.1	1.5	1.9	4.6				
2	12/12/74		7.95	146.0	371			63.5		12.7	2.9				
S-31	11/ 9 /75	7.0	6.90	72.0	182	46.4	0.43	210.8	5.2	5.7	4.1				
S-32	11/ 9 /75	7.0	5.20	3.0	93	49.7	0.53	43.1	1.5	2.5	3.6				
S-33	11/ 9 /75	4.0	7.10	44.0	106	34.1	0.53	153.2	1.8	2.5	12.8				
S-34	10/28/74		7.85	121.0	280			261.1		7.7	1.4				
S-35	10/28/74		7.95	83.0	224			45.6		3.2	2.8				
	12/12/74		7.75	87.0	209			200.0		26.8	2.6				
S-36	12/12/74		7.88	144.0	343			165.3		6.0	6.8				
	11/ 9 /75	5.5	7.90	135.0	317	66.9	0.53	189.2	20.2	24.0	9.2				
3A	12/12/74		7.70	81.0	259			134.3							
3	12/12/74		7.88	116.0	331			140.0		6.7	10.1				
S-37	12/12/74		7.00	50.0	433			52.6		6.0	42.4				
	11/ 9 /75	4.0	6.80	73.0	158	55.4	0.53	8.0	2.5	6.3	43.9				
S-38	10/28/74		7.98	22.0	121			275.1		3.2	2.8				
	11/ 9 /75	0.5	6.60	21.0	107	54.6	0.53	254.9	4.6	6.3	1.5				
S-39	9/28/74				62			311.2		25.6	1.8				
S-40	9/28/74				76			24.6		42.7	2.6				
S-41	9/28/74				264			181.5		16.4	2.0				
S-42	9/28/74				203			185.5		19.2	2.6				
S-43	9/28/74				236			87.8		17.8	3.1				
S-44	9/28/74	11.5			57			20.4		93.2	1.8				
S-45	9/28/74	10.0			95					22.1	1.5				
S-46	11/ 9 /75		6.80	44.0	181	45.6	1.92	176.4	2.1	5.0	4.6				

[a]Enrichment MF procedure used with all Total Coliform samples of 11/9/75.

Appendix I

Investigations of the Accuracy of Analytical Chemical Procedures

The analytical procedures which were utilized during this project were those of the Utah Water Research Laboratory (Cowan and Porcella 1973). In most cases, they followed Standard Methods (APHA 1971). No variations upon these chemical techniques were found to be necessary in order to process the Little Cottonwood samples.

The accuracy of chemical procedures was monitored periodically by analyzing quality control samples of known composition supplied by the laboratory supervisory staff. The results of these tests consistently indicated that the chemical analyses were being performed with satisfactory accuracy. Several other checks on both the accuracy and completeness of analytical results were also employed.

An approximate accuracy check on the tests for total dissolved solids and specific conductance was made by a comparison of their results. According to Hem (1970), the ratio of TDS in mg/l to conductivity ranges between 0.55 and 0.75 in most natural waters. If the anions are mainly chloride and bicarbonate the ratio tends to be on the low end of the range while waters with high sulfate contents may have ratios at the upper end or even above it (Hem 1970).

The Little Cottonwood ratios of TDS to specific conductance were very close to the lower end of the range, as is shown by Table I-1. These ratios would probably have been higher and well within the range suggested by Hem if the filtrations for the TDS analysis had been done with glass fiber filters and the drying at 103°C. However, the newer EPA-recommended procedure which was followed employed 0.45 μ membrane filters and 180°C drying ovens. This must have reduced the TDS results, both by allowing less material through the smaller pores of the filter and by driving off mechanically occluded water and organic matter from

Table I-1. Average (total dissolved solids/specific conductance) ratios in Little Cottonwood Canyon, January 1974 - August 1975.

Period	Site Number											Average
	1B	1	2	3	3A	4	5	7	8	9	10	
11/23/74-2/22/75	--	--	282	210	153	150	143	183	--	453	379	232
3/15/75-5/10/75	--	-	1886	592	958	548	374[a]	-	--	1173[a]	568[a]	912
5/17/75-11/9/75	291[a]	24	166	185	192	220	230	257	96[a]	183	212	196

[a]Results from one sample during the period.

the residue (APHA 1971). As more results from the new TDS procedure become available, it is anticipated that the ratios of TDS to conductivity will tend to be less than those previously reported and that the lower end of the typical range will drop below 0.55.

Below Site 3, a slight but steady downstream decrease in the ratios is apparent in Table I-1. The noticeably low result from Red Pine Fork indicates that tributary flow in that region of the canyon had a dilution effect which probably accounted for the lower ratios observed at Sites 9 and 10. The reduction in ratios was presumably linked to the decline in sulfate content which was noted at the same sites.

Another way to monitor the general accuracy of analytical results utilizes equivalent weights. The total milliequivalents per liter of anions or of cations should be approximately equal to 1 percent of the specific conductance. This relationship is regarded as more consistent than the preceding one (Hem 1970), but its accuracy relies on conductance factors for both anions and cations having average values of 50. Standard Methods (APHA 1971) indicates that this approximation may fail if large amounts of chloride, potassium, or sulfate are present,

because all of these possess conductance factors which are significantly larger than 50.

The percent deviation of the sum of the meq/l from specific conductance/100 was calculated for both anions and cations on all samples which had been analyzed for the predominant ion species. The expected relationship held up fairly well in most cases. However, as Table I-2 shows, the deviations increased noticeably during the period of March 15 to May 10, 1975.

When the results from individual samples were inspected, there was no apparent relationship between fluctuations in the concentrations of constituents and the presence of unusual percent deviations. This reduced the likelihood that experimental error might have contributed to the unusual deviations, and it was concluded that the increased deviations during the late winter and early spring had been caused by the water conditions.

During the period between March 15 and May 10, increases in daytime temperatures favored roadside runoff. The period ended when the start of significant area runoff caused sharp increases in streamflow. The trends in ionic concentrations showed that high levels of sodium chloride were present during approximately the same period.

Comparisons of the conductance factors of major ions showed that the greater positive deviation for anions during the late winter and early spring was consistent with an increase in the proportion of chloride and sulfate as compared to bicarbonate (APHA 1971). Similarly, the greater negative deviation for cations could have been caused by an increased concentration of sodium and magnesium relative to calcium

Table I-2. Average percent deviations of ion sums from $\frac{\text{Specific Conductance}^a}{100}$, Little Cotton Creek and tributaries, 1974-1975.

Period	Site Number											Average
	1	2	3	3A	4	5	6	7	8	9	10	
						Anions						
8/6/74-3/8/75	-4.98	-3.50	-0.92	8.09	-0.47	1.61	11.62	3.48	14.74	6.05	6.71	3.15
3/15/75-5/10/75	--	24.25	13.22	18.03	7.65	11.95	32.26	14.24	34.21	10.82	9.79	15.17
5/17/75-11/9/75	-2.35	2.48	9.78	9.04	4.88	9.43	16.43	9.60	-7.40	8.00	10.78	7.44
Average for all Samples 8/6/74-11/9/75	-4.19	3.62	4.69	11.06	2.59	5.88	16.74	7.01	16.03	7.52	8.37	6.59
						Cations						
11/23/74-3/8/75	-12.43	-7.19	-2.97	-9.24	-2.62	-7.49	-10.92	-2.22	-6.43	-8.84	-10.83	-6.87
3/15/75-5/10/75	--	-31.11	-11.32	-23.98	-18.11	-13.83	-10.23	2.24	-15.60	-28.43	-11.45	-18.08
5/17/75-11/9/75	-15.19	-0.58	-8.65	1.59	-2.97	-1.12	-51.29	-12.78	0.6	-8.50	-4.00	-5.57
Average for all Samples 11/23/74-11/9/75	-14.73	-9.63	-7.13	-10.50	-6.88	-6.72	-18.72	-7.26	-8.04	-13.29	-8.56	-9.22

[a]Calculated as $\left[\frac{\text{S.C./100 - Sum Anions (or Cations) in meq/l}}{\text{S.C./100}}\right] 100$

and potassium levels. Ratios of these constituents were calculated and significant increases in Cl^-/HCO_3^- and Na^+/Ca^{++} were apparent during the months of March-April-May. Ratios of $SO_4^=/HCO_3^-$ and Mg^{++}/Ca^{++} showed more fluctuations and less definite increases.

Another possible explanation for increased positive deviations could have been the presence of ions which contributed to specific conductance but for which analyses were not performed. However, the more complete chemical characterizations of the intake water to the Little Cottonwood Treatment Plant which were carried out by the Metropolitan Water District of Salt Lake City failed to show that significant increases in any other major ions were typical during the late winter and early spring months. Further, the presence of unanalyzed ions would not have accounted for the cation deviations.

Accordingly, it was concluded that the greater deviations which appeared during the prerunoff period when roadside drainage occurred could be attributed to increased proportions of NaCl in the stream and possibly to additional contributions by $MgSO_4$. The association of these events indicates that salt from roads and parking lots may have been a major factor in causing the increased deviations. During the rest of the year, the agreement between meq/l of anions or cations and specific conductance/100 was quite good.

The third method which was used to check the results of analyses was the calculation of anion-cation balances. This procedure is considered to provide the most reliable of all checks on analytical accuracy, but it requires that a fairly complete series of analyses be performed in order to establish the concentrations of all of the important ions which are present in the sample. A complete characterization

of Little Cottonwood water was not a goal of this project and only selected parameters were generally analyzed. Thus, results from the majority of the samples were not amenable to the ion balance approach. However, there were 103 samples from 18 different sample days between November 23, 1974, and November 9, 1975, which were analyzed for all the parameters that were followed during this project.

Anion-cation balances for these samples were calculated and the results are summarized in Table I-3. In 75 percent of the samples the sum of the cations was found to exceed the sum of the anions. This trend seems too one-sided to have been caused by random analytical errors and suggests either that one or more of the important anions had not been included in the analyses or that the experimental procedures tended to produce results which were low for anions or high for cations.

It is significant that the tendency for cations to exceed anions was more pronounced during the middle and late part of winter and was especially prominent during the period of March 15 to May 10. This is shown in Table I-4. Sample handling techniques during these months were unchanged and provided no apparent reason for the greater discrepancies. However, as previously discussed, this was a period of low streamflow when roadside runoff and mine drainages may have had dominant roles in determining the ionic composition of the stream. There is a possibility that these sources may have supplied either ions for which analyses were not performed or materials which interfered with the accuracy of the analytical procedures in use. In support of this supposition, it is noteworthy that the worst agreement between anions and cations during this period seemed to occur at Sites 2 and 3A. These sites had the best combinations of low streamflow and maximum exposure to mine drainages

Table I-3. Anion-cation balance results for samples on which all analyses were performed. Ion difference ($\Sigma A - \Sigma C$) as percentage of one standard deviation. Little Cottonwood Creek and tributaries, 1974-1975.

Sample Date	Site Number											Average
	1B	1	2	3	3A	4	5	7	8	9	10	
11/23/74			209.1	290.4		151.6		280.8		479.1		282.2
12/27/74			220.3	236.6	316.6	252.5				488.4	472.7	331.2
12/29/74			196.2	36.0	20.1	245.6						124.5
1/25/75			136.4	17.9	66.8	51.5	118.5	10.0			163.0	80.6
2/ 2 /75			72.6	11.8	50.8	126.0	38.9				0.9	50.2
2/ 8 /75			684.7	564.7	319.1	171.3	183.5			478.6	640.3	434.6
2/15/75			307.8	211.8		87.4		258.8		364.5	616.2	307.8
2/22/75			424.9	308.8	145.6	115.6	231.8					245.3
3/15/75			2868.6	784.3	1485.8	798.3				1173.3		1422.1
3/29/75			3828.7	690.0	1313.1	418.4					567.8	1363.6
4/26/75			391.0	541.6	752.2	426.7	373.6					497.0
5/10/75			455.8	353.3	281.2							363.4
5/17/75			255.6		114.7	347.9	275.0			59.4	324.2	229.5
5/24/75			126.6	189.5			236.4				147.4	175.0
5/31/75			273.2	108.3	374.6	207.0	416.9	282.7		209.3	226.5	262.3
6/21/75			80.6			146.9	160.9	288.2		353.0		205.9
6/28/75		31.4		257.9		136.1		190.2		184.4	125.2	154.2
11/ 9 /75	290.6	15.7	92.1		87.5	263.4	58.9	267.4	96.1	110.3	234.8	151.7

Table I-4. Average differences between anions and cations expressed as percentages of one standard deviation, Little Cottonwood Canyon, 1974-1975.

Period	Site Number											Average
	1B	1	2	3	3A	4	5	7	8	9	10	
11/23/74-2/22/75	--	--	282	210	153	150	143	183	--	453	379	232
3/15/75-5/10/75	--	--	1886	592	958	548	374[a]	--	--	1173[a]	568[a]	912
5/17/75-11/9/75	291[a]	24	166	185	192	220	230	257	96[a]	183	212	196

[a]Results from one sample during the period.

and runoff from roads and thus should have been most affected by the introduction from those sources of substances which interfered with the anion-cation balances.

Data from the Metropolitan Water District of Salt Lake City showed that the average fluoride content at the Little Cottonwood Treatment Plant intake over a five year (1969-1974) period was 0.28 mg/l. The highest levels were recorded during the winter months. More limited U.S. Forest Service data provided some indication of a downstream increase in fluoride and suggested that groundwater concentrations might approach 1 mg/l at some springs within the canyon. Therefore, there is reason to believe that a more complete inventory of ions in Little Cottonwood Creek would have produced closer anion-cation agreement than was obtained.

In order to compare their variations on a periodic basis, the ion balances were calculated for one sample run during each month beginning with November 1974. Sample runs which had been analyzed for all the major ions were available at least that frequently, although it was necessary in several cases to use the results from samples in which some of the less plentiful constituents had not been measured. The results of these ion balances are presented in Table I-5. They showed the same tendency for greater imbalances to occur during the late winter and early spring. At other times, the average ion differences fell between one and two standard deviations and were slightly outside the range of $\pm$ one standard deviation which is considered acceptable by Standard Methods (APHA 1971) for samples which have been completely characterized.

Table I-5. Anion-cation balance results for period sample runs on which analyses for all major ions were performed. Little Cottonwood Canyon, 1974-1975.

Sample Date	Site Number	Sum of Anions, meq/l	Sum of Cations, meq/l	Ion Difference ($\Sigma A - \Sigma C$)	Standard Deviation ($0.1065 + 0.0155 \Sigma A$)	Ion Difference as Percentage of One Standard Deviation
11/23/74	2	3.6502	3.9912	-0.3410	0.1631	209.1
	3	3.4822	3.9481	-0.4659	0.1605	290.4
	4	3.2076	3.4445	-0.2368	0.1562	151.6
	5	2.8502	3.0138	-0.1636	0.1507	108.6
	7	2.4022	2.8058	-0.4036	0.1437	280.8
	8	1.4340	1.6050	-0.1710	0.1287	132.8
	9	2.8201	2.1004	0.7197	0.1502	479.1
	10	2.5486	3.1670	-0.6184	0.1460	423.6
	Average					259.5
12/29/74	2	3.8881	4.2154	-0.3272	0.1668	196.2
	3	3.6431	3.7018	-0.0587	0.1630	36.0
	3A	2.6159	2.6454	-0.0295	0.1471	20.1
	4	3.1801	3.5627	-0.3826	0.1558	245.6
	9	2.1961	2.9019	-0.7058	0.1405	502.2
	10	3.6632	4.2927	-0.6295	0.1633	385.5
	Average					230.9
1/25/75	2	4.6750	4.9192	-0.2442	0.1790	136.4
	3	3.7350	3.7056	0.0294	0.1644	17.9
	3A	2.8492	2.9498	-0.1006	0.1507	66.8
	4	3.5407	3.4575	0.0831	0.1614	51.5
	5	3.3714	3.1833	0.1881	0.1588	118.5
	6	2.0561	2.5767	-0.5207	0.1384	376.3
	7	2.8945	2.9097	-0.0152	0.1514	10.0
	8	1.5508	1.8226	-0.2718	0.1305	208.2
	9	2.3394	2.3560	-0.0166	0.1428	11.6
	10	3.7088	3.9760	-0.2672	0.1640	163.0
	Average					116.0
2/ 2 /75	2	4.0567	3.9337	0.1230	0.1694	72.6
	3	3.7177	3.6983	0.0194	0.1641	11.8
	3A	2.9290	2.8518	0.0771	0.1519	50.8
	4	3.5808	3.3767	0.2041	0.1620	126.0
	5	3.2876	3.2263	0.0613	0.1575	38.9
	9	2.3428	2.6705	-0.3277	0.1428	229.5
	10	4.0403	4.0388	0.0015	0.1691	0.9
	Average					75.8
3/ 8 /75	2	6.2954	6.4703	-0.1749	0.2041	85.7
	3	3.5784	3.7095	-0.1311	0.1620	80.9
	3A	2.4184	3.3487	-0.9303	0.1440	646.1
	4	3.3778	3.6577	-0.2798	0.1589	176.2
	5	2.9968	3.3085	-0.3117	0.1530	203.8
	7	2.4380	2.9699	-0.5319	0.1443	368.6
	8	1.3828	1.9064	-0.5237	0.1279	409.3
	9	2.4344	3.0357	-0.6013	0.1442	416.9
	10	3.4933	4.1099	-0.6166	0.1607	383.8
	Average					307.9

Table I-5. Continued.

Sample Date	Site Number	Sum of Anions, meq/l	Sum of Cations, meq/l	Ion Difference ($\Sigma A - \Sigma C$)	Standard Deviation ($0.1065 + 0.0155 \Sigma A$)	Ion Difference as Percentage of One Standard Deviation
4/26/75	2	6.3808	7.1840	-0.8032	0.2054	391.0
	3	3.6212	4.5021	-0.8808	0.1626	541.6
	3A	3.1226	4.2877	-1.1651	0.1549	752.2
	4	3.8618	4.5717	-0.7099	0.1664	426.7
	5	3.3853	3.9793	-0.5939	0.1590	373.6
	9	2.7519	3.3759	-0.6240	0.1492	418.4
	10	2.8507	3.3190	-0.4683	0.1507	310.8
	Average					459.2
5/24/75	2	2.6060	2.7919	-0.1859	0.1469	126.6
	3	3.2411	3.5381	-0.2970	0.1567	189.5
	3A	3.1492	3.5526	-0.4033	0.1553	259.7
	4	3.5328	3.7256	-0.1928	0.1613	119.6
	5	3.0287	3.3914	-0.3627	0.1534	236.4
	9	2.8538	2.5611	0.2927	0.1507	194.2
	10	2.3832	2.5946	-0.2115	0.1434	147.4
	Average					181.9
6/10/75	2	2.3500	2.2481	0.1019	0.1429	71.3
	3A	2.2752	2.6718	-0.3966	0.1418	279.7
	4	2.1579	2.2484	-0.0905	0.1400	64.7
	5	1.9159	1.8354	0.0805	0.1362	59.1
	7	1.6214	1.6555	-0.0341	0.1316	25.9
	9	1.3857	1.3905	-0.0048	0.1280	3.7
	10	1.5321	1.3903	0.1418	0.1303	108.9
	Average					87.6
7/ 5 /75	3	1.5331	1.7378	-0.2047	0.1303	157.2
	4	1.4273	1.7383	-0.3111	0.1286	241.9
	5	1.2445	1.3390	-0.0945	0.1258	75.2
	9	0.9381	1.0607	-0.1226	0.1210	101.3
	10	0.7641	1.1402	-0.3761	0.1183	317.8
	Average					178.7
8/ 9 /75	2	2.3946	2.3380	0.0566	0.1436	39.4
	3	2.2734	2.9894	-0.7160	0.1417	505.1
	3A	1.8357	1.8643	-0.0286	0.1350	21.2
	4	2.3453	2.5327	-0.1874	0.1429	131.2
	5	2.0433	2.6350	-0.5917	0.1382	428.2
	7	1.6157	1.9099	-0.2942	0.1315	223.7
	9	1.4454	1.5233	-0.0779	0.1289	60.4
	10	1.4682	1.4820	-0.0138	0.1293	10.7
	Average					177.5
11/9/75	1B	3.4560	2.9908	0.4652	0.1601	290.6
	1	2.4682	2.4455	0.0227	0.1448	15.7
	2	3.9438	3.7894	0.1544	0.1676	92.1
	3A	2.6407	2.5117	0.1290	0.1474	87.5
	4	3.8418	3.4044	0.4374	0.1661	263.4
	5	3.3909	3.2972	0.0936	0.1591	58.9
	7	3.0297	2.6194	0.4103	0.1535	267.4
	8	1.7184	1.5904	0.1280	0.1331	96.1
	9	2.3727	2.5307	-0.1580	0.1433	110.3
	10	3.3236	3.6946	-0.3710	0.1580	234.8
	Average					151.7

Appendix J

Results of Supplemental Bacteriological Methods

Except for the use of the enrichment membrane filter method in all of the total coliform tests performed after August 20, 1975, the bacteriological results which were discussed in the text were all obtained with the single-stage membrane filter procedures that are given in Standard Methods (APHA 1971).

A number of other analytical procedures for the detection of bacterial indicator organisms are available in the literature, and several of them were employed during the course of the project although the extent of their use was limited. There were three reasons for the use of the alternate procedures. One was to both confirm and amplify results which had been obtained from the routine sampling operations. Secondly, it was desired to evaluate the relative effectiveness of some of the different techniques when they were applied to Little Cottonwood conditions. Finally, it was thought that the data which would be obtained might allow more direct comparisons between the results of this project and those obtained by other investigators using the alternative techniques.

The results of the enrichment membrane filter tests are given in Tables J-1, J-2, and J-3.

The increased efficiency of the enrichment total coliform procedure, which is described in Standard Methods (APHA 1971), is evident from Table J-4. This table contains the average monthly results from samples collected between January 25 and August 9, 1975. During this period, both one and two-stage membrane filter tests were performed on the same samples, and the data from both methods are summarized in the table.

Table J-1. Enrichment membrane filter total coliform results in counts/100 ml. Little Cottonwood Canyon, 1975.

Sample Date	Site											
	1B	1	2	3	3A	4	5	6	7	8	9	10
1/25/75			7.6	0	7.8	5.6	21.3	4.6	13.2	4.6	38.5	52.3
2/2/75			0	0.2	2.4	11.1	3.2				32.8	10.4
2/8/75			0	0.2	4	3	15.2				45.2	60
2/15/75			0	0.2	8	19.4	12	2.2	12.2	5	52	64
2/22/75			0	0	0	33.2	16.2				70	12
3/1/75			0	0.6	0	5.5	2				3	0.8
3/8/75			0	0	0.6	42.8	4	3.2	14.8	3.8	46	18
3/15/75			0	0	1.6	16	0				8	1
3/29/75			0	0.4	2	41					10	1
4/5/75			0	0	0	2	0.4	0.4	0.6	1	17	5.5
4/12/75			0	0	0	0	0				0	2.5
4/19/75			0	0	4.8	26.8	25.2				10.8	8
4/26/75			0	0	8.4	5.2	10.8				33	29.8
5/3/75			0	2.6	6.8	20	11.5	11.6	18.4	7	31.2	36
5/10/75			0	4.8	1.8		4.3				27.3	26.6
5/17/75			8	0.4	4.4	44.5	0				3.7	1.5
5/24/75			8	7	9	29	30				29	50
5/31/75			35	53	21	32	43	29	40		74	99
6/10/75			48	34	10	28	42		0		106	66
6/14/75			8	27	6	27	36		56		54	64
6/21/75			90	12	12	26	10		32		78	2
6/28/75		36	34	25		28	41		39.5		46	44.5
7/5/75		40	53	22		63	34		30		64	47
7/12/75		43	27	18		47	76		56		68	133
7/19/75		76	62	6	18	20	8		48		52	26
7/26/75		76	20	6	36	9	29		78		122	116
8/2/75		38	40.4	6.4	37	11.2	7		20		32	42
8/9/75		114	56	16.4	117	18	72		52		148	56

Table J-2. Enrichment membrane filter fecal coliform results in counts/100 ml. Little Cottonwood Canyon, 1975.

Sample Date	Site											
	1B	1	2	3	3A	4	5	6	7	8	9	10
6/10/75			0.8	0.7	0	0.6	0.6		0.2		0.2	0.2
6/14/75			0	0.6	0	1.0	1.2		0.2		0.4	0.6
6/21/75			0	0	0.3	3.3	0.3		0		8.0	9.0
6/28/75		0.4	1.4	0.8		1.0	0.6		0.8		1.6	0.3
7/5/75		0.2	1.8	0.8		1.6	1.6		3.6		1.2	2.4
7/26/75		0.2	0	0	0.6	0.2	0.2		30.6		1.8	0.5
8/2/75		2.4	1.6	0	0.2	46.4	0		0		0.6	49.2
8/9/75		2.2	3.4	0	0	0	1.6		1.2		1.0	3.0

Table J-3. Enrichment membrane filter fecal strep results in counts/100 ml. Little Cottonwood Canyon, 1975.

Sample Date	Site										
	1B	1	2	3	3A	4	5	6	7	8	9	10
1/25/75			57.1	32.2	–	35.2	29.4	11.8	89	30.8	48.2	79
2/2/75			110	480	61	499	175				196	226
2/8/75			404	–	608	848	668				1400	624
2/15/75			1320	360	880	2240	900	460	1060	900	1000	520
2/22/75			0	40	220	100	600				150	100
3/1/75			800	2760	100	740	30				180	420
3/8/75			510	770	300	520	300	80	230	100	690	420
3/15/75			980	1380	260	220	340				860	1500
3/29/75			1220	620	940	180					380	680
4/5/75			160	1960	480	740	4760	3080	320	500	2280	280
4/12/75			–	260	480	460	280				780	700
4/19/75			–	3060	900	2840	720				1080	820
4/26/75			280	240	40	40	120				340	0
5/3/75			32	398	–	6	2	386	22	0	2	510
5/10/75			388	58	20	158	2				944	170
5/17/75			8	24	16	20	20				8	176
5/24/75			4	0	3	0	1				1	5

Table J-4. Monthly average total coliform results in counts/100 ml for two parallel membrane filter methods. Little Cottonwood Canyon, January 25-August 9, 1975.

Month	Site Number																					
	1		2		3		3A		4		5		6		7		8		9		10	
	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.
1/75			0	7.6	0.2	0	2.6	7.8	2.2	5.6	2.0	21.3	2.6	4.6	4.4	13.2	0.4	4.6	14.8	38.5	28.2	52.3
2/75			0	0	0.1	0.2	1.5	3.6	2.9	16.7	1.3	11.7	3.6	2.2	11.6	12.2	2.2	5.0	7.4	50.0	8.5	36.6
3/75			0	0	0.1	0.3	1.3	1.1	2.5	26.3	2.4	2.0	4.8	3.2	16.0	14.8	6.8	3.8	7.3	16.8	8.9	5.2
4/75			0	0	0.1	0	0.7	3.3	1.7	8.5	0.4	9.1		0.4	0.6	0.6	2.6	1.0	1.9	15.2	3.6	11.5
5/75			5.0	10.2	2.8	13.6	4.1	8.6	5.6	31.4	4.9	17.8	13.2	20.3	9.0	29.2	4.6	7.0	15.7	33.0	15.2	42.6
6/75	17.0	36.0	23.8	45.0	5.7	24.5	4.3	9.3	2.8	27.3	5.8	32.3			12.0	31.9			13.3	71.0	17.3	44.1
7/75	7.8	58.8	3.8	40.5	4.6	13.0	7.3	27.0	2.6	34.8	2.4	36.8			12.6	53.0			5.7	76.5	10.6	80.5
8/75	25.1	76.0	3.4	48.2	12.4	11.4	19.5	77.0	4.9	14.6	14.3	39.5			5.5	36.0			7.4	90.0	6.1	49.0
Recovery Ratio (2-stage/1-stage)	2.60		4.34		2.79		3.08		6.66		4.72		1.35		3.08		1.29		5.10		3.43	

The recovery ratios, which are the average ratios of the two-stage to one-stage results, were computed for all cases in which parallel tests were done on the same samples. The average ratios are also shown in Table J-4. The overall average recovery ratio for all sites was 3.5.

The expected advantage of a two-stage procedure is that the mild conditions to which the bacteria are exposed during the initial pre-enrichment phase will provide a period of recovery and repair for those organisms which have been weakened or injured by their previous environment. When later exposed to the more harsh conditions of the differential medium, these previously attenuated organisms are more likely to reproduce than if they had encountered the differential test originally as they would during the one-stage test.

The greatest increase in recovery rates because of the use of an enrichment procedure would be expected if the samples had been collected fairly soon after the pollution occurred. The bacteria might be undergoing rapid debilitation and death at this point, but they could presumably still be revived in sizable numbers by the proper treatment. Less difference in the results of the two methods would be expected if bacterial die-off had not yet started, or if most of the organisms had already died and those that remained were hardy enough to grow even without the pre-enrichment step.

The differences between the total coliform recovery ratios at various sample sites were quite striking and may have been related to the time which had elapsed between the occurrence of the pollution and the collection of the samples. The ratios at Sites 6 and 8 approached unity, and pollution of White Pine and Red Pine Forks would be most likely to occur along the upper reaches of the streams several miles

above the sample sites. In contrast, the ratios were much higher along the main stream and they appeared to follow a consistent pattern in which the peak ratios occurred at sites immediately below sources of potential human-related pollution. These peaks were followed by steady downstream declines in the ratios until the site at which the next peak occurred was reached.

The enrichment fecal coliform procedure which was used was the two-layer agar method described by Rose et al. (1975). Because it became available late in the project, the method was only employed with a limited number of samples. During the period between June 10 and August 9, 1975, parallel one and two-stage fecal coliform tests were performed on eight sets of samples. The monthly average results and recovery ratios from these runs are presented in Table J-5.

Downstream trends in the fecal coliform recovery ratios were very similar to the pattern shown by the total coliforms. The fact that both organisms had peaks at Sites 2 and 4 and at the mouth of the canyon implicated Alta, Snowbird, and the Tanner's Flat-Wasatch Resort area as possible sources of the pollution. These results also suggested that the fecal bacteria underwent rapid die-off during downstream flow.

For unknown reasons, the recovery ratios at several other sites tended to drop below one. This may have been a result of the small number of samples and the few colonies recovered from each. Both of these factors could have affected the statistical validity of the data. If the ratios were truly representative of stream conditions, it would appear that the two-layer agar method may have been sampling a somewhat different population of fecal coliform organisms than that which responded to the one-stage test. Further clarification of this situation

Table J-5. Monthly average fecal coliform results in counts/100 ml for two parallel membrane filter methods. Little Cottonwood Canyon, June 10-August 9, 1975.

Month	Site Number																	
	1		2		3		3A		4		5		7		9		10	
	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.
6/75	1.0	0.4	0.7	0.6	0.3	0.5	0.1	0.1	0.8	1.5	0.9	0.7	0.3	0.3	2.0	2.6	2.6	2.5
7/75	0.3	0.2	0.1	0.9	1.3	0.4	0	0.6	0.2	0.9	1.1	0.9	33.6	17.1	1.2	1.5	5.2	1.5
8/75	2.1	2.3	1.8	2.5	0	0	0.2	0.1	0.6	23.2	0.7	0.8	0.7	0.6	0.5	0.8	0.9	26.1
Recovery Ratio (2-stage/1-stage)	0.93		1.36		0.62		1.57		1.93		0.85		0.53		1.32		2.90	

would be necessary before the results of the two-layer method could be accepted as reliable in Little Cottonwood Canyon.

Rose et al. (1975) reported that their greatest success in obtaining increased fecal coliform recovery with the two-layer agar method came from situations in which bacteria had been exposed to possible metabolic injury due to the presence of chlorine, heavy metals, or seawater. They also sampled a reservoir which apparently did not contain toxic pollutants, but in which natural bacterial die-off was taking place. Of all their samples, the Little Cottonwood water conditions during the summer would appear to have most closely resembled those of the impoundment, and the overall Little Cottonwood recovery ratio of 1.4 was quite similar to the average recovery ratio of 1.2 which they obtained from the reservoir. In light of the more complicated procedure of the two-layer method, this relatively small increase in the recovery of fecal coliforms may not be sufficient to justify its use for Little Cottonwood and similar streams. It is unfortunate that the two-layer agar method could not have been tried during the winter when the effect of toxic mine drainage on bacterial die-off at Site 2 seemed to be most pronounced and when the enrichment method might therefore have given a greater improvement in recovery rates.

The enrichment procedure of Rose and Litsky (1965) was used to test all samples collected between January 25 and May 24, 1975, for fecal streptococci. Parallel tests were also run using the regular procedure. The monthly average results from both the one and two-stage tests are shown in Table J-6. Downstream trends in the recovery ratios agreed fairly well with those exhibited by the coliform results

Table J-6. Monthly average fecal strep results in counts/100 ml for two parallel membrane filter methods. Little Cottonwood Canyon, January 25-May 24, 1975.

Month	Site Number																	
	2		3		3A		4		5		6		7		8		9		10	
	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.	1-stg.	2-stg.
1/75	3.2	57.1	0.4	32.2	1.2		4.2	35.2	2.4	29.4	2.8	11.8	7.2	89.0	2.8	30.8	2.2	48.2	46.2	79.0
2/75	0.1	459	0.2	293	1.4	442	0.8	922	0.6	586	0.6	460	0.6	1060	0.8	900	1.4	687	1.5	368
3/75	4.1	878	0.5	1380	0.4	400	5.7	415	1.2	223	0.8	80.0	1.4	230	0.4	100	1.6	528	13.2	755
4/75	1.0	220	1.2	1380	0.8	475	6.7	1020	3.3	1470	1.2	3080	1.6	320	0.2	500	1.1	1120	3.9	450
5/75	1.3	108	15.1	120	1.6	13.0	2.6	46.0	3.3	6.3	18.8	386	2.4	22.0	4.8	0	3.7	239	9.6	215
Recovery Ratio (2-stage/1-stage)	223		184		328		149		276		166		130		170		310		46	

except that the peak ratios which appeared at Site 4 with the other enrichment tests were present at Site 5 in the fecal strep results.

The results of the single-stage fecal strep test agreed fairly well with the results of the other bacterial indicator tests, but the enrichment method produced unusually high recovery ratios which averaged 198. Because of this discrepancy, further investigations were carried out. Although the colonies which developed on M-Enterococcus Agar following the pre-enrichment phase appeared in all respects to be typical fecal strep types, an unusually high percentage failed to confirm as fecal streptococci when subjected to the additional classification tests described in Standard Methods (APHA 1971). Together with a report from the Technical Service Department of the Millipore Corporation that other investigators were encountering numerous difficulties with the enrichment procedure, these results led to its discontinuance at the end of May, 1975.

It is believed that considerable effort would be necessary to solve the problems associated with the two-stage fecal strep method before it could be easily applied to the sampling of mountain streams. Therefore, the results obtained with the enrichment procedure for fecal streptococci are not considered accurate. Nevertheless, enough of the colonies which grew during the two-stage procedure were confirmed as fecal streptococci to indicate that the M-Enterococcus Agar alone, as used during the one-stage test, did not obtain complete recovery of all the fecal streptococci present in the stream.

Another bacteriological procedure which was employed was the multiple-tube fermentation technique which is commonly referred to as the MPN or Most Probable Number method (APHA 1971). The confirmed test

version was used. A total of 17 sample runs between August 10, 1974, and September 6, 1975, were analyzed by means of the total coliform MPN test. The results are given in Table J-7. In addition, the fecal coliform MPN test was performed on 14 of these runs, and those results are contained in Table J-8. The monthly average total coliform MPN values are summarized in Table J-9.

When the membrane filter total coliform data were compared with the results of parallel MPN tests run on the same samples, it was found that 55 percent of the sample concentrations given by the one-stage membrane filter technique were within the 95 percent confidence limits of the MPN tests while 76 percent of the two-stage membrane filter results fell within those limits. In general, the MPN values were higher than the one-stage membrane filter counts and roughly similar to the concentrations obtained from the two-stage procedure. In a sample-by-sample comparison, 75 percent of the one-stage tests produced concentrations which were less than the corresponding MPN indexes and only 15 percent of the one-stage results were greater than the MPNs. With the two-stage membrane filter procedure, 46 percent of the results were less than the MPN indexes and 48 percent were greater.

It is commonly accepted that the population of coliforms which responds to the membrane filter test is not identical to that which grows in the multiple-tube fermentation procedure, and precise equivalency of the results of the different techniques would not be expected. Furthermore, studies have indicated that the actual number of coliform organisms present does tend to be less than the MPN value, which is really a statistical estimate (APHA 1971). The results of the parallel tests, therefore, seem to be adequate to establish a correspondence

Table J-7. Results of the total coliform MPN confirmed test in Little Cottonwood Canyon, 1974-1975.

Sample Date	MPN Index/100 ml 95% Confidence Limits	Site Number											
		1B	1	2	3	3A	4	5	6	7	8	9	10
8/10/74	MPN		4	7	4		43	<3	<3	<3	<3	20	150
	Conf. Limits		<0.5 - 20	1 - 23	<0.5 - 20		7 - 210					7 - 89	30 - 440
10/5/74	MPN		150	9	23		240	93	9	23	240	15	93
	Conf. Limits		30 - 440	1 - 36	4 - 120		36 - 1300	15 - 380	1 - 36	4 - 120	36 - 1300	3 - 44	15 - 380
3/8/75	MPN			<3	<3	21	93	23	< 3	43	9	93	23
	Conf. Limits					4 - 47	15 - 380	4 - 120		7 - 210	1 - 36	15 - 380	4 - 120
3/15/75	MPN			9	<3	9	210	⩾2400					
	Conf. Limits			1 - 36		1 - 36	35 - 470						
4/5/75	MPN			<3	<3	9	43	4	93	23	9	240	23
	Conf. Limits					1 - 36	7 - 210	<0.5 - 20	15 - 380	4 - 120	1 - 36	36 - 1300	4 - 120
5/24/75	MPN			43	23	23	93	23				93	43
	Conf. Limits			7 - 210	4 - 120	4 - 120	15 - 380	4 - 120				15 - 380	7 - 210
7/5/75	MPN		150	90	<30		30	90		90		70	230
	Conf. Limits		30 - 440	10 - 360			<5 - 130	10 - 360		10 - 360		10 - 230	40 - 1200
7/19/75	MPN		23	9	< 3	9	4	4		4		23	23
	Conf. Limits		4 - 120	1 - 36		1 - 36	<0.5 - 20	<0.5 - 20		<0.5 - 20		4 - 120	4 - 120
7/26/75	MPN		9	4	4	39	23	4		23		9	28
	Conf. Limits		1 - 36	<0.5 - 20	<0.5 - 20	7 - 130	4 - 120	<0.5 - 20		4 - 120		1 - 36	10 - 150
8/2/75	MPN		23	9	< 3	<30	4	4		7		14	9
	Conf. Limits		4 - 120	1 - 36			<0.5 - 20	<0.5 - 20		1 - 23		3 - 37	1 - 36
8/9/75	MPN		43	93	15	120	240	75		43		23	150
	Conf. Limits		7 - 210	15 - 380	3 - 44	30 - 380	36 - 1300	14 - 230		7 - 210		4 - 120	30 - 440
8/20/75	MPN	9	150	23			9	14				93	
	Conf. Limits	1 - 36	30 - 440	4 - 120			1 - 36	3 - 37				15 - 380	
8/23/75	MPN	4	43	150			39	43				39	
	Conf. Limits	<0.5 - 20	7 - 210	30 - 440			7 - 130	7 - 210				7 - 130	
8/27/75	MPN	23	43	9			4	9				15	
	Conf. Limits	4 - 120	7 - 210	1- 36			<0.5 - 20	1 - 36				3 - 44	
8/30/75	MPN	75	23	23			9	39				210	
	Conf. Limits	14 - 230	4 - 120	4 - 120			1 - 36	7 - 130				35 - 470	
9/5/75	MPN	43	21	4			23	240				1100	
	Conf. Limits	7 - 210	4 - 47	<0.5 - 20			4 - 120	36 - 1300				150 - 4800	
9/6/75	MPN	93	150	7			4	23				150	
	Conf. Limits	15 - 380	30 - 440	1 - 23			<0.5 - 20	4 - 120				30 - 440	

Table J-8. Results of the fecal coliform MPN confirmed test in Little Cottonwood Canyon, 1974-1975.

Sample Date	MPN Index/100 ml 95% Confidence Limits	Site Number											
		1B	1	2	3	3A	4	5	6	7	8	9	10
3/8/75	MPN			<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Conf. Limits												
3/15/75	MPN			<3	<3	<3	<3	<3					
	Conf. Limits												
4/5/75	MPN			<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	Conf. Limits												
5/24/75	MPN			<3	<3	<3	<3	<3				<3	<3
	Conf. Limits												
7/19/75	MPN		<3	<3	<3	<3	<3	<3		<3		<3	9
	Conf. Limits												1 - 36
7/26/75	MPN		<3	<3	<3	7	<3	<3		23		4	3
	Conf. Limits					1 - 21				4 - 120		<0.5 - 20	<0.5 - 13
8/2/75	MPN		4	<3	<3	<3	<3	<3		<3		3	4
	Conf. Limits		<0.5 - 20									<0.5 - 9	<0.5 - 20
8/9/75	MPN		<3	<3	<3	<3	<3	<3		<3		<3	4
	Conf. Limits												<0.5 - 20
8/20/75	MPN	<3	4	<3			<3	<3				<3	
	Conf. Limits		<0.5 - 20										
8/23/75	MPN	<3	<3	<3			<3	<3				<3	
	Conf. Limits												
8/27/75	MPN	4	<3	<3			<3	<3				<3	
	Conf. Limits	<0.5 - 20											
8/30/75	MPN	<3	4	<3			<3	<3				<3	
	Conf. Limits		<0.5 - 20										
9/5/75	MPN	<3	<3	<3			<3	<3				<3	
	Conf. Limits												
9/6/75	MPN	<3	20	<3			<3	<3				<3	
	Conf. Limits		7 - 89										

Table J-9. Monthly average total coliform MPN indices per 100 ml. Little Cottonwood Canyon, August 1974-September 1975.

Month	Site Number											
	1B	1	2	3	3A	4	5	6	7	8	9	10
8/74		4	7	4		43	<3	<3	<3	<3	20	150
10/74		150	9	23		240	93	9	23	240	15	93
3/75			5[a]	<3	15	152	1212	<3	43	9	93	23
4/75			<3	<3	9	43	4	93	23	9	240	23
5/75			43	23	23	93	23				93	43
7/75		61	34	3[a]	24	19	33		39		34	94
8/75	28	54	51	8[a]	63[a]	51	31		25		66	80
9/75	68	86	6			14	132				625	

[a]Value of 0.5 assigned to individual index of < 3 in order to compute average.

between the two methods which helps to substantiate the reliability of the membrane filter results. The existence of such a relationship provides support for the routine use of the much simpler membrane filter technique during this project.

Because lauryl tryptose broth was the medium used in both the presumptive MPN test and the pre-enrichment step of the two-stage membrane filter procedure, the fact that the MPN results were in closer agreement with those of the two-stage procedure than with those of the single-stage membrane filter method was not unexpected. This did, however, provide an additional reason to use the enrichment membrane filter technique in the study of mountain streams whenever it is feasible.

The fecal coliform MPN results were very low. Out of a total of 104 Little Cottonwood samples which were tested, only 13 produced a positive reaction in the EC medium. With no positives in a 3-tube test, the MPN index is reported as "less than 3 per 100 ml." In 96 percent of the cases, the single-stage membrane filter results either agreed with the index which signified the lack of a positive MPN reaction or fell within the 95 percent confidence limits for samples which did produce positive test results. There were a limited number of comparisons possible between the results of the MPN and enrichment membrane filter tests for fecal coliforms. In 85 percent of the comparisons which could be made, however, the enrichment membrane filter counts either were within the confidence limits of positive MPN tests or were less than three per 100 ml in cases where no positive MPN results were obtained.

The low MPN fecal coliform results appeared to confirm the low rates of recovery obtained with both of the membrane filter procedures. The results from all three methods agreed in their indications that

fecal coliform organisms either were scarce in Little Cottonwood Creek or could rarely be recovered if they were present. As there were no significant differences apparent in the results of the three methods, the one-stage membrane filter technique, which is the simplest, would seem to be the most desirable approach for the routine analysis of fecal coliforms in Little Cottonwood Creek.