

## Tables

	<u>Page</u>	
1	Watershed Characteristics	14
2	Watershed Area by County	15
3	LCR Watershed in Cottonwood County	17
4	LCR River Basin Ditches in Cottonwood County	17
5	LCR River Basin Minor Watershed in Brown County	18
6	River Elevation and Gradients by Water Quality Site	22
7	1990 Land Use and Land Cover	31
8	Highly Erodable Land (HEL) Summary	35
9	% of Sub-shed by RUSLE erosion model	36
10	Acres of sub shed by RUSLE	37
11	Number of erodible acres within 200 feet of a waterway	37
12	Slope classes	41
13	Sub watershed and slope classes	41
14	Wetland Characteristics	42
15	Tillage Transact Survey	47
16	Feedlot Characteristics	48
16a	Analysis of Potential Phosphorus	49
17	Distance between monitoring sites	54
18	Reporting Units and Methods	59
19	FWMC Impairment Categories	62
20	Yield Impairment Categories	62
21	Interquartile Range of Concentration	64
22	MNDNR 1986 Fish Survey-Macro-inverts	75
23	MNDNR 1986 Fish Survey-Species	76
24	TSS Concentrations	84
25	Nitrate Nitrogen Concentrations	85
26	Total Phosphorus Concentrations	86
27	Ortho Phosphorus Concentrations	87
28	Fecal Coliform Bacteria Counts	88
29	Flow Conditions-Hydrographs 1998	90
30	Flow Conditions-Hydrographs 1999	90
31	1998 FLUX Flow Weighted Mean Concentrations (mg/l)	97
32	1998 FLUX Accumulated Yield (lbs/acre)	97
33	1998 FLUX Isolated Yield (lbs/acre)	97

34	1999 FLUX Flow Weighted Mean Concentrations (mg/l)	97
35	1999 FLUX Accumulated Yield (lbs/acre)	97
36	1999 FLUX Isolated Yield (lbs/acre)	97
37	2000 FLUX Flow Weighted Mean Concentrations (mg/l)	97
38	2000 FLUX Accumulated Yield (lbs/acre)	97
39	2000 FLUX Isolated Yield (lbs/acre)	97
40	Average FWMC for 1998-2000 mg/l	98
41	Average Accumulated yield for 1998-2000 lbs/acres	98
42	Average Isolated yield for 1998-2000 lbs/acre	98
43	MN DNR 2000-Macro-invert Results	121
44	MN DNR 2000 Fish Survey	123-125
45	Paired Sample (Site 1 and Site W1)	131
46	Paired Sample Storm Event 7-10-00	132
47	Paired Sample Base flow 7-31-00	132
48	Paired Sample Event 8-17-00	132
49	Stream Bank Protection Measures	153

## Figures

	<u>Page</u>	
1	Water Surface Elevation by River Mile	24
2	Normal Annual Precipitation	25
3	State Climatology Stations	26
4	Monthly Precipitation Totals 1998	27
5	Monthly Precipitation Totals 1999	28
6	Comparison of Monthly Precipitation Totals 1998-99	29
7	Water Year Precipitation	30
8	TSS During Storm Event	80
9	Nitrate Nitrogen During Storm Event	81
10	Total Phos During Storm Event	83
11	Reactive Phos During Storm Event	83
12	TSS Monitoring 1996-2000	84
13	Nitrate Nitrogen Monitoring 1996 – 2000	85
14	Total Phos Monitoring 1996 – 2000	86
15	Ortho Phos Monitoring 1996 – 2000	87
16	Site 2 Hydrograph	91
17	Site 3 Hydrograph	92
18	Site 4 Hydrograph	93
19	TSS – Site 3	111
20	Nitrate Nitrogen - Site 3	111
21	Total Phosphorus – Site 3	112
22	Ortho Phos – Site 3	112
23	TSS Yield Comparison	113
24	Total Phosphorus	113
25	Nitrate Nitrogen Comparison	113
26	TSS & Transparency Relationship	115
27	Channel Adjustment	127
28	Longitudinal Profile of Study Area	128
29	Primary Cross Section	128
30	Secondary Cross Section	129
31	Nitrate Nitrogen Comparison of Grab Samples between Sites	133
32	Nitrate Reductions at Red Top Farms	139

## Maps

	<u>Page</u>	
1	Path of 1998 Tornado	10
2	LCR in relation to State of Minnesota/basins	13
3	LCR Watershed Land Slope	20
4	LCR Watershed Shaded Relief	21
5	River Gradients	23
6	1990 Land Use	32
7	Soils	34
8	Modeled Soil Erosion Potential – Upper Portion	38
9	Modeled Soil Erosion Potential – Middle Portion	39
10	Modeled Soil Erosion Potential – Lower Portion	40
11	NWI Wetlands and Lakes	43
12	Artificial Public Drainage Ditch and Subsurface tile	45
13	Feedlots	50
14	Water Quality Monitoring Sites & Sub-sheds	55
14a	Minnesota’s Seven Eco-regions	64
15	Fish Survey Locations	74
16	Location of JD 9	77
17	Index map showing site locations relative to watershed	79
18	1999 Flux FWMC TSS (April – Oct.)	99
19	1999 Flux FWMC Total Phos (April – Oct.)	100
20	1999 Flux FWMC Nitrate Nitrogen (April – Oct.)	101
21	1999 Flux Accumulated Yield TSS (April – Oct.)	102
22	1999 Flux Accumulated Yield Total Phos. (April – Oct.)	103
23	1999 Flux Accumulated Yield Nitrate Nitrogen (April – Oct.)	104
24	1999 Flux Isolated Yield TSS (April – Oct.)	105
25	1999 Flux Isolated Yield Total Phos. Yield April – Oct.	106
26	1999 Flux Isolated Yield Nitrate Nitrogen Yield April – Oct.	107
27	TISWA Results	116
28	Location of JD 9	126
29	Paired Sample Location	131
30	Priority Management Areas	160

## **Photos**

	<u>Page</u>
1 Springs	89
2 Grab Sample Site 4-high flow	94
3 TSS Lab Filters From Storm Event	130