

Table 1.VR. Vermillion River Monitoring Station Information



Station Address: 2005 Vermillion Street, Hastings, MN 55303
County: Dakota
Major Basin: Mississippi River Basin
Watershed: Vermillion River
Drainage Area: 326.97 square miles

Station Operator: Dakota County Soil and Water Conservation District

Metropolitan Council Environmental Services Contact Information:

Contact Person: Casandra Champion
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Watershed District or Watershed Management Organization:

Station Overview: MCES has supported water quality monitoring of the Vermillion River since 1995. The monitoring station is located inside the ConAgra Mill near Highway 61 in Hastings, Minnesota, about two miles upstream from the Mississippi

River floodplain. There is no rain gage at this station. The Vermillion River flows from western Scott County and drains most of Dakota County.

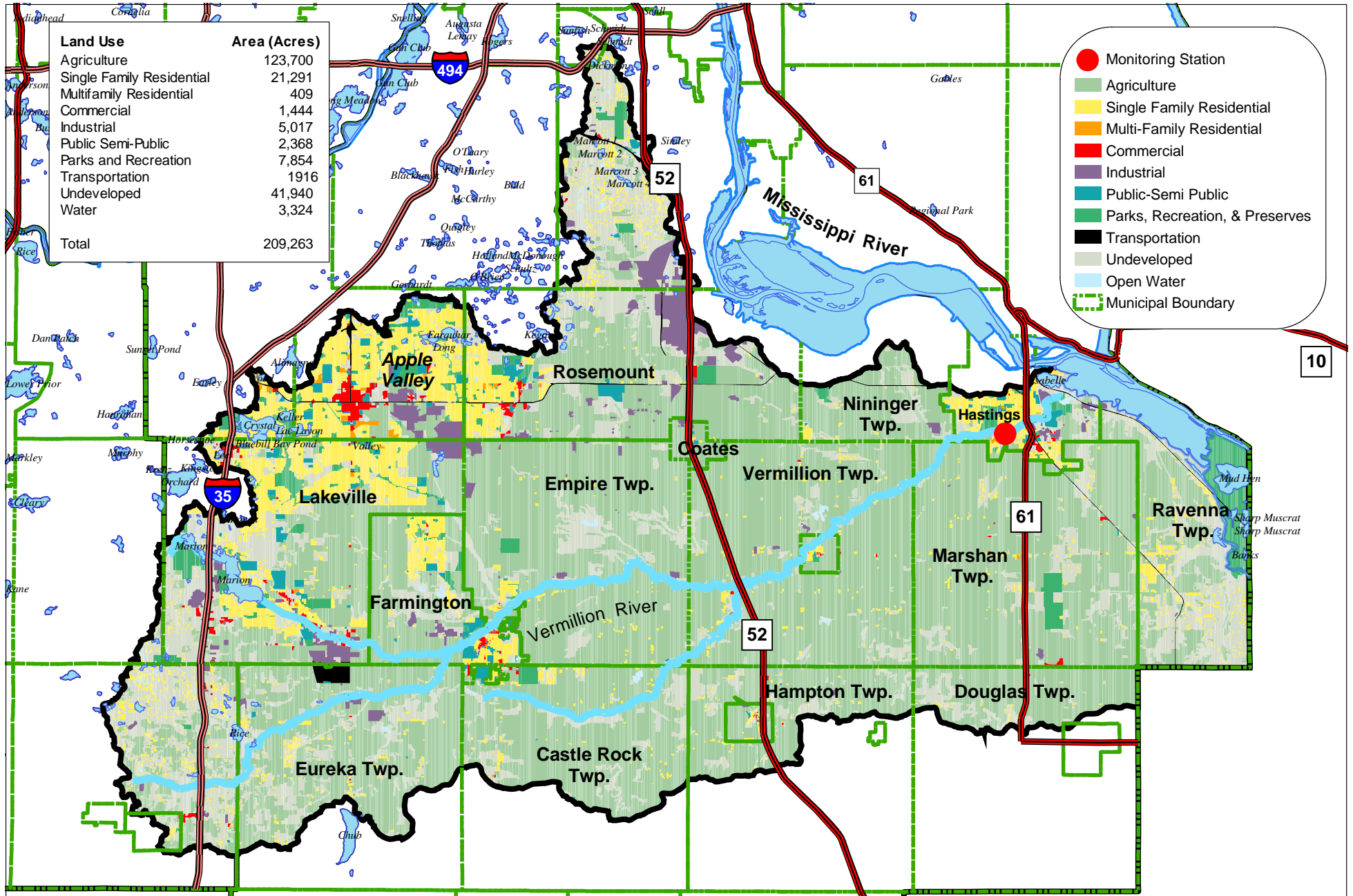
2001 Monitoring Year: Snowmelt began during the last week of March 2001. Daily average flows were estimated prior to April 1. The peak daily average flow of 757 cfs occurred on April 25, 2001.

A composite sample collected on the rising limb of the snowmelt hydrograph, on April 1-3, 2001, had the highest total suspended solids (TSS) concentration (83 mg/L) of all 2001 samples. A significant rainfall-related runoff event occurred during the May 11-23 period. The composite sample collected on the rising limb of this event hydrograph, on May 14-15, had the highest TSS concentration (58 mg/L) for a rainfall event.

Twenty samples were collected for water quality analysis during 2001, including 10 composite samples and 10 grab samples. The MCES annual water quality monitoring plan includes 12 monthly baseflow (“non-event”) grab samples and approximately 10 to 15 flow-weighted composite samples collected during all runoff events in the open-water season (March – November). The 2001 sampling scheme met the goals of the MCES monitoring work plan.

For additional stream monitoring information and monitoring methods regarding this site, see www.metrocouncil.org/environment/RiversLakes.

Figure 1.VR. Vermillion River Monitoring Station Location and Watershed Characteristics



0 1.5 3 6 Miles



Figure 2.VR. Vermillion River 2001 Hydrograph with Sampling Information

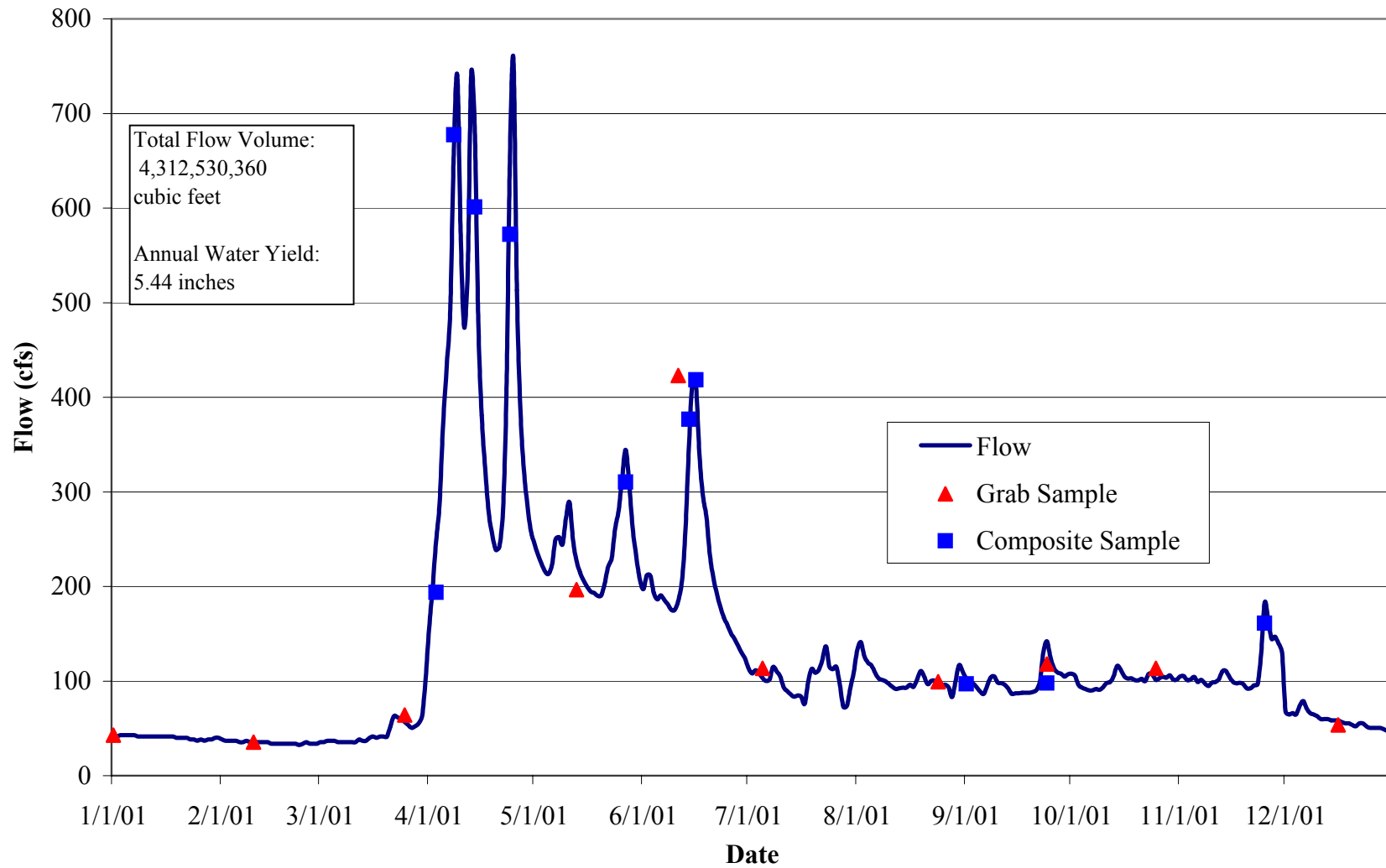


Table 2.VR. Vermillion River 2001 Water Chemistry Information

Variable	N	Mean	Median	Minimum	Maximum	25%	75%	STD
Chloride, mg/L	3	34	na	32	35	na	na	na
Hardness, mg/L	20	259	272	170	302	235	294	41
Cadmium, ug/L	19	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Chromium, ug/L	19	0.8	0.5	0.5	2.1	0.5	0.9	0.5
Copper, ug/L	19	5.1	4.5	2.8	11.8	4.0	6.0	2.1
Lead, ug/L	19	0.8	0.5	0.5	2.0	0.5	0.9	0.5
Nickel, ug/L	19	2.9	2.8	2.2	4.5	2.6	3.0	0.5
Zinc, ug/L	19	7.0	7.0	4.0	16.0	5.0	8.0	3.0
Nitrogen, Total Kjeldahl, mg/L	20	1.30	0.90	0.40	9.60	0.60	1.10	2.00
Nitrogen, Total Nitrate, mg/L	20	6.03	6.44	2.62	12.60	3.47	7.77	2.61
Phosphorus, Total, mg/L	20	0.79	0.60	0.25	4.00	0.43	0.79	0.80
Phosphorus, Total Dissolved, mg/L	17	0.47	0.34	0.17	1.07	0.27	0.64	0.28
Solids, Total Suspended, mg/L	20	24	19	2	83	8	39	21
Solids, Volatile Suspended, mg/L	20	7	6	2	22	2	9	5
Turbidity, NTU	11	4	3	1	14	2	7	4

na: Data are insufficient to calculate these statistics.

Table 3.VR. Vermillion River 2001 Annual Loading Information* for Suspended Solids and Nutrients

Variable	Annual Load (tons)	Annual Yield (lbs/acre)	Annual Normalized Yield (lbs/acre/in of water)	Flow Weighted Mean Concentration (mg/L)
Solids, Total Suspended	3,390	32	6	26
Phosphorus, Total	96.18	0.92	0.17	0.74
Phosphorus, Total Dissolved	65.66	0.63	0.12	0.51
Nitrogen, Total Nitrate	749.94	7.17	1.32	680.22

* 2001 Annual Loading Information is provisional and may be subject to minor revisions.

Table 4.1.VR. Vermillion River 2001 Macroinvertebrate Monitoring Results and Metrics

Monitoring Date 05/21/01

Class	Order	Family	Common Name	Life Stage	Organism Count
Gastropoda			Snails		3
Insecta	Coleoptera	Dytiscidae	Predaceous Diving Beetles	Larvae	4
Insecta	Diptera	Chironomidae	Midges	Larvae	3
Insecta	Ephemeroptera	Baetidae	Small Minnow Mayflies	Larvae	55
Insecta	Ephemeroptera	Baetiscidae	Armored Mayflies	Larvae	1
Insecta	Ephemeroptera	Heptageniidae	Flatheaded Mayflies	Larvae	10
Insecta	Hemiptera	Corixidae	Water Boatman	Larvae	4
Insecta	Plecoptera	Perlidae	Comon Stoneflies	Larvae	7
Insecta	Plecoptera	Pteronarcyidae	Giant Stoneflies	Larvae	6
Insecta	Trichoptera	Hydropsychidae	Common Netspinners	Larvae	25
Insecta	Trichoptera	Odontoceridae	Strongcase Makers	Larvae	4

Macroinvertebrate Taxa Metrics

Total Taxa	11
EPT Taxa	6
% EPT Taxa	55
Diptera Taxa	1
% Diptera Taxa	9
Mean Tolerance Value	4.00

Macroinvertebrate Organism Metrics

Total Organisms	122
EPT Individuals	108
% EPT Individuals	89
Diptera Individuals	3
% Diptera Individuals	2
Chironomidae Individuals	3
% Chironomidae Individuals	2

Water Quality

Degree of Organic Pollution

Hilsenhoff Biotic Index	3.81	Very Good	Possible slight organic pollution
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Table 4.2.VR. Vermillion River 2001 Macroinvertebrate Monitoring Results and Metrics

Monitoring Date 09/28/01

Class	Order	Family	Common Name	Life Stage	Organism Count
Gastropoda			Snails		2
Insecta	Coleoptera	Dytiscidae	Predaceous Diving Beetles	Adult	5
Insecta	Coleoptera	Elmidae	Riffle Beetles	Larvae	2
Insecta	Coleoptera	Noteridae	Burrowing Water Beetles	Adult	12
Insecta	Diptera	Chironomidae	Midges	Larvae	400
Insecta	Diptera	Culicidae	Mosquitoes	Larvae	1
Insecta	Diptera	Simuliidae	Black Flies	Larvae	1
Insecta	Diptera	Stratiomyidae	Aquatic Soldier Flies	Larvae	2
Insecta	Diptera	Tipulidae	Crane Flies	Larvae	2
Insecta	Ephemeroptera	Heptageniidae	Flatheaded Mayflies	Larvae	15
Insecta	Ephemeroptera	Oligoneuriidae	Brushlegged Mayflies	Larvae	1
Insecta	Ephemeroptera	Tricorythidae	Little Stout Crawlers	Larvae	1
Insecta	Hemiptera	Belostomatidae	Giant Water Bugs		2
Insecta	Hemiptera	Nepidae	Water Scorpion	Adult	7
Insecta	Hemiptera	Pleidae	Pygmy Backswimmer		1
Insecta	Odonata	Calopterygidae	Broadwinged Damselflies	Larvae	17
Insecta	Odonata	Gomphidae	Clubtails	Larvae	1
Insecta	Plecoptera	Pteronarcyidae	Giant Stoneflies	Larvae	5
Insecta	Plecoptera		Stoneflies	Larvae	1
Insecta	Trichoptera	Brachycentridae	Humpless Case Makers	Larvae	3
Insecta	Trichoptera	Hydropsychidae	Common Netspinners	Larvae	75
Insecta	Trichoptera	Leptoceridae	Longhorned Case Makers	Larvae	3

Macroinvertebrate Taxa Metrics

Total Taxa	21
EPT Taxa	8
% EPT Taxa	38
Diptera Taxa	5
% Diptera Taxa	24
Mean Tolerance Value	4.24

Macroinvertebrate Organism Metrics

Total Organisms	559
EPT Individuals	104
% EPT Individuals	19
Diptera Individuals	406
% Diptera Individuals	73
Chironomidae Individuals	400
% Chironomidae Individuals	72

	Water Quality	Degree of Organic Pollution
Hilsenhoff Biotic Index	5.50	Very Good
		Possible slight organic pollution