

### **Valentine Lake (62-0071) Rice Creek Watershed District**

Valentine Lake is located within the City of Arden Hills in Ramsey County. The lake has a surface area of 60-acres, and a maximum and mean depth of 4.0 m (13.1 feet) and 1.5 m (4.9 feet), respectively. Because of the shallowness of the lake, its entire surface area is considered littoral, the shallow (0-15 foot depth) area dominated by aquatic vegetation, and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The mean depth and surface area of the lake translates to an approximate volume of 300 ac-ft. The result of comparing the lake's surface area to its 2,237-acre drainage area (watershed) is a rather large 37:1 watershed-to-lake size ratio (the greater the ratio, the greater the potential stress on the lake from surface runoff).

This was the third year that Valentine Lake has been involved in CAMP (2001-2002 being the others). In fact, the 2001-2002 CAMP data were the only data found through STORET nationwide water quality database search. Therefore 2001-2003 represents the only water quality data readily available for the lake.

The lake was monitored 12 times between mid-April and mid-October, 2003. On each sampling day the lake was monitored for TP, CLA, TKN, and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The mean summertime (May through September) surface TP concentration was 67.8 µg/l (minimum of 32.0 µg/l, maximum of 106.0 µg/l). The mean CLA and Secchi transparency readings were 31.1 µg/l (minimum of 4.9 µg/l, maximum of 88.0 µg/l) and 1.18 m (minimum of 0.50 m, maximum of 1.96 m), respectively. The lake's mean surface TKN concentration was 0.93 mg/l (minimum of 0.73 mg/l, maximum of 1.10 mg/l).

The lake's 2003 quality grades determined from each parameter's summertime mean are TP= C, CLA= C, and Secchi transparency= D. While the resulting overall grade for 2003 (C) is identical to those of 2001-2002, the individual grades of 2001-2002 were better. The lake's 2003 nutrient concentrations and Secchi transparencies are graphed on the following page.

Because of the limitedness of the lake's water quality database, the determination of any only long- or short-term trends are not possible to determine. It is reported on the MPCA website, however, that a recently conducted trend analysis on the lake's Secchi transparency data revealed a statistically significant improvement in recent water clarity. To better understand the lake's water quality and what direction it may be heading, more years of data collection are needed.

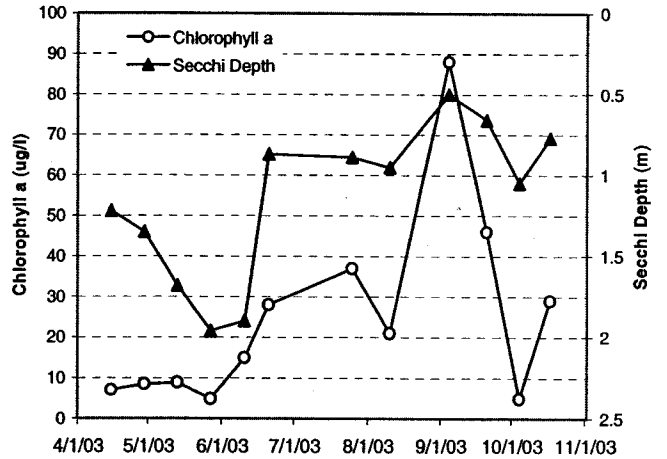
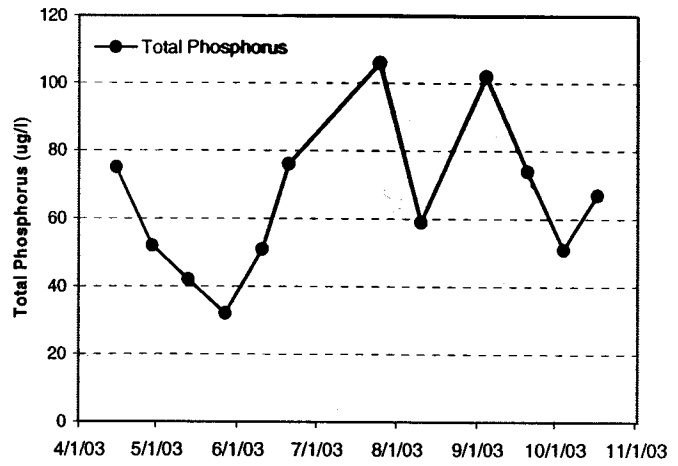
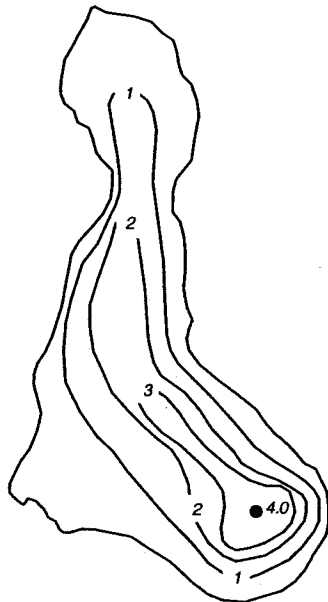
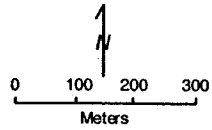
The perceived physical and recreational conditions of the lake, recorded by the volunteers, were ranked on a 1-to-5 scale. The rankings are shown in both tabular and graphical form on the lake's associated information sheet. The mean physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability ranking was 2.0 (2- "minor aesthetic problem").

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Randy Anhorn of the Metropolitan Council at (651) 602-8743 or [randy.anhorn@metc.state.mn.us](mailto:randy.anhorn@metc.state.mn.us).

**Valentine Lake**  
Arden Hills, Ramsey Co.

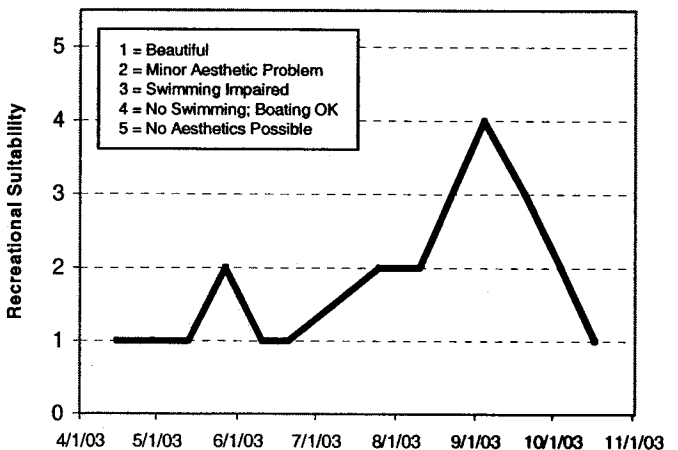
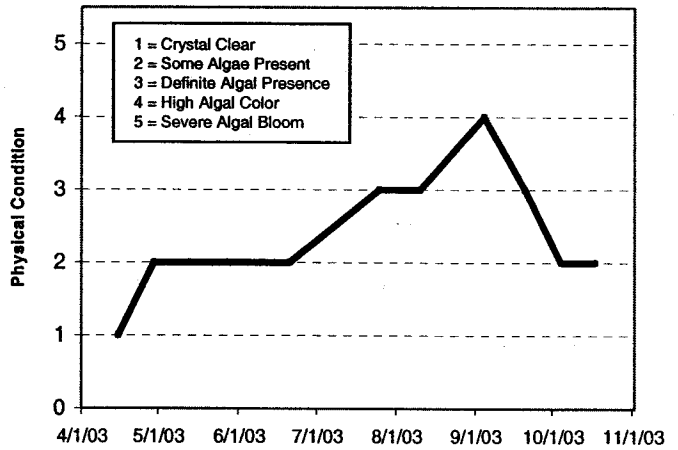
Lake ID: 620071  
WD: Pice Creek  
Volunteer: Nathan Bro

● Sampling site  
Contours in meters



**2003 Data**

Date	Surf. Temp. (C)	Bot. Temp. (C)	Surf. DO (mg/l)	Bot. DO (mg/l)	CLA (ug/l)	Surf. TP (ug/l)	Bot. TP (ug/l)	Secchi (m)	PC	RS
04/15/03	15.6		10.1	7.1	75	1.22	1	1		
04/29/03	15.6		9.9	8.5	52	1.35	2	1		
05/13/03	14		9.44	8.9	42	1.68	2	1		
05/27/03	21.5		11.1	4.9	32	1.96	2	2		
06/10/03	19.5		8.23	15	51	1.9	2	1		
06/20/03	20		9.73	28	76	0.87	2	1		
07/25/03	19.2		7.22	37	106	0.89	3	2		
08/10/03	26.9		8.07	21	59	0.953	3	2		
08/04/03	21.3		9.2	88	102	0.5	4	4		
09/20/03	17.7		7.83	46	74	0.66	3	3		
10/04/03	11.2		10.86	4.9	51	1.05	2	2		
10/17/03	12.3		8.55	29	67	0.77	2	1		



**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Overall												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus										C	C	C
Chlorophyll a										B	B	C
Secchi Depth										C	C	D
Overall										C	C	C

Source: Metropolitan Council and STORET data

2003 data collected by Jennifer Wegscheid & Bob Kistler