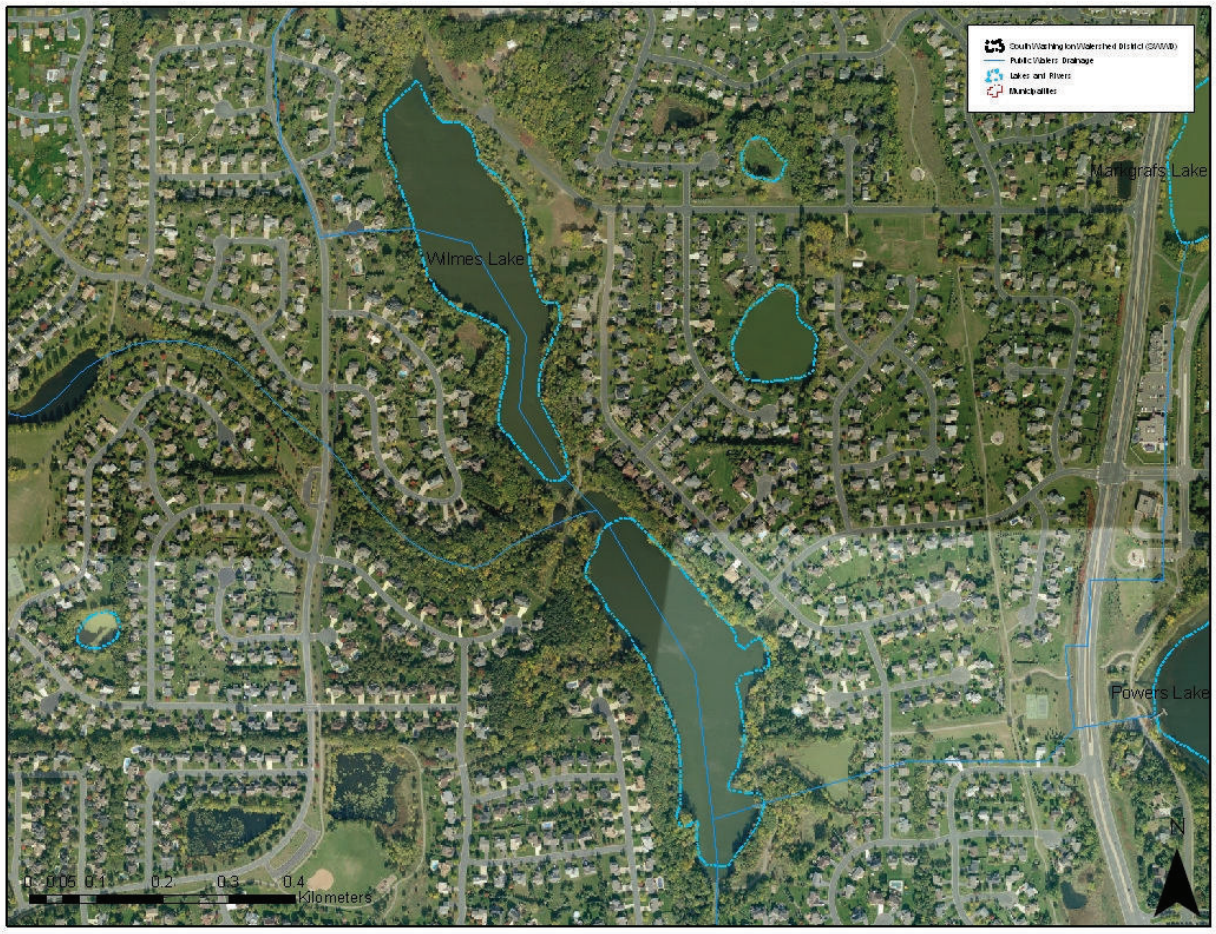
Wilmes Lake

DNR ID #82-0090	Municipality: Woodbury
Surface Area: 30 Acres	Watershed Area: 3,242 Acres
Mean Depth: 3-5 feet	Maximum Depth: 7-18 feet
SWWD Maximum Allowable Phosphorus Load: 0.10 lbs/ac/yr	
SWWD Trophic State Index (TSI) Goal: 60-63	

Map 19: Wilmes Lake



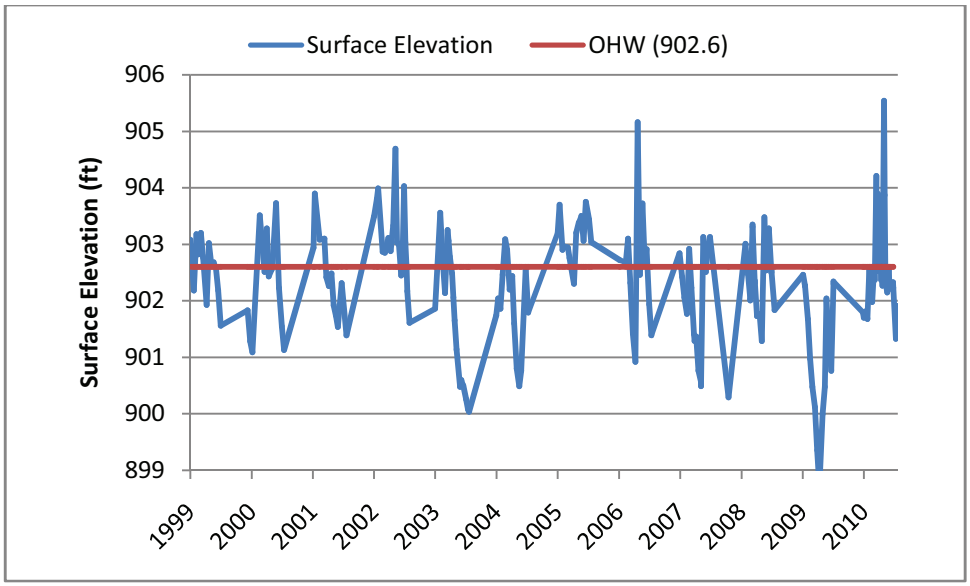
Wilmes Lake (Map 19) is situated in the Northern subwatershed. Similar to Armstrong Lake, Wilmes lake is divided into two basins by a berm with a culvert connecting the north and south basins. The southern portion of the lake has a maximum depth of 7 feet while the northern portion has a maximum depth of 18 feet. Wilmes Lake receives flows from Armstrong Lake and Markgrafs Lake, together adding approximately 1,000 acres of drainage. There is also a lift station at Powers Lake that would allow for water to be pumped from Powers to Wilmes. However, that pump station is not routinely used.

Results

Lake level has been recorded at Wilmes Lake since 1999 and are shown in Figure 35. Lake water quality was monitored 12 times April through October in 2010. Water Quality results are below in Table 26. Annual growing season averages of total phosphorus, chlorophyll a, and secchi transparency are shown

graphically in Figures 36-38. Wilmes Lake's 2010 trophic status and historical lake grades are presented in Table 27.

Figure 35: Wilmes Lake Surface Elevation, 1999-2010



Date	Secchi Depth (m)	Water Temperature (°C)	Pheophytin a Corrected Chlorophyll a (ug/L)	Trichromatic Uncorrected Chlorophyll a (ug/L)	TKN (mg/L)	TP (mg/L)
04/20/10	1.3	19.1	10	11	0.91	0.056
05/15/10	2.1	16.4	6.1	7	1	0.072
05/26/10	3.2	26	2.2	2.9	0.84	0.035
06/29/10	2.2	24.1				
07/16/10	0.9	27.1	53	52	1.7	0.108
07/29/10			14	15	1.1	0.079
08/08/10	2	27.4	15	17	1.4	0.051
08/27/10	1.4	24.4	26	29	1.1	0.108
09/06/10	1	20.4	93	100	1.4	0.107
09/26/10	1.1	17.8	23	25	1.1	0.12
10/03/10	1.2	15.6	32	37	1.2	0.116
10/16/10	1	14.4	35	40	1.3	0.127

Table 26: Wilmes Lake 2010 Water Quality Data Collected Through the Met Council Citizen Assisted Monitoring Program (CAMP)

Figure 36: Wilmes Lake Historical Mean Growing Season Total Phosphorus Concentrations

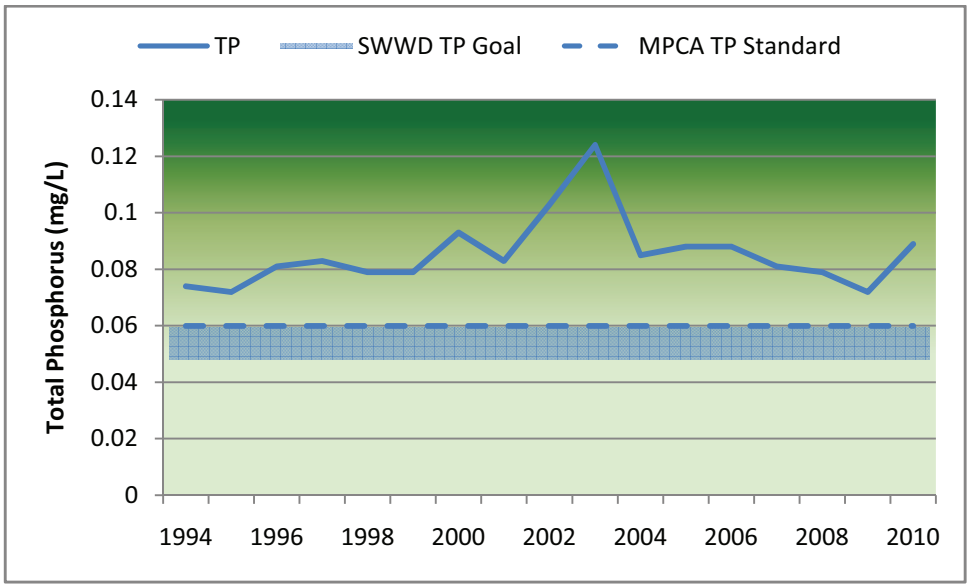


Figure 37: Wilmes Lake Historical Mean Growing Season Chlorophyll a[1] Concentrations

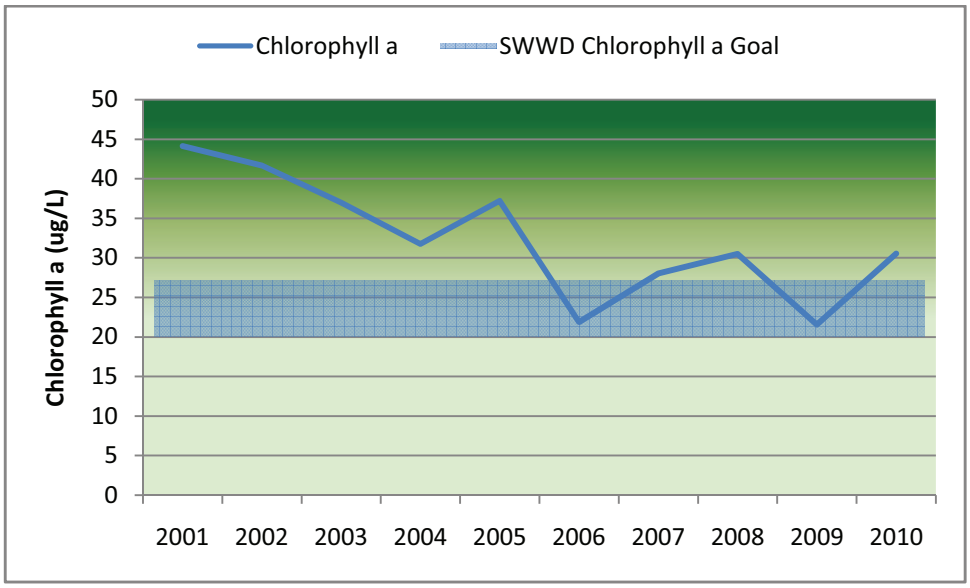
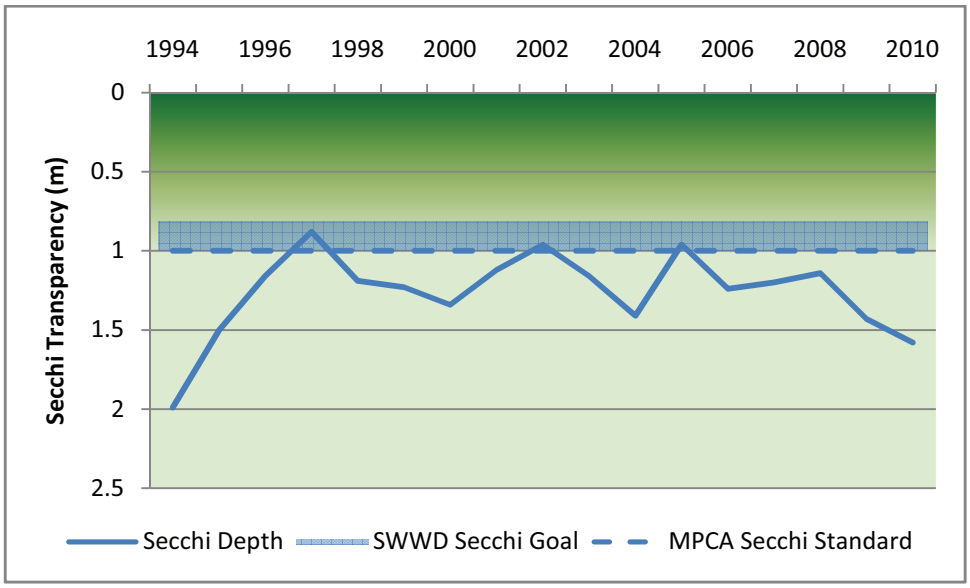


Figure 38: Wilmes Lake Historical Mean Growing Season Secchi Transparency



Parameter	Trophic Status	Lake Grades																	
		94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
Total Phosphorus	69; Eutrophic	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Chlorophyll a	64; Eutrophic								C	C	C	C	C	C	C	C	C	C
Secchi Transparency	53; Eutrophic	C	C	C	D	D	C	C	D	D	D	C	D	C	C	D	C	C
Overall	Eutrophic	C	C	C	D	D	C	C	D	D	D	C	D	C	C	D	C	C

Table 27: Wilmes Lake 2010 Trophic Status and Historical Lake Grades

Discussion

Historically, Wilmes surface elevation has displayed high fluctuation which continued in 2010. Wilmes discharged regularly throughout 2010 as the surface elevation overtopped the weir outlet set at the OHW.

Mean growing season total phosphorus concentration exceeded both SWWD's TSI goal for the Lake and MnPCA's shallow lake standard. Mean growing season chlorophyll a also exceeded SWWD and MnPCA standards although there is a long-term trend indicating improving chlorophyll a concentrations. Secchi transparency exceeds SWWD's goal and MnPCA's standard as it generally has in the past. The disparities in TSI scores for the three parameters indicate a system where algae dominates light attenuation in the water column, but is somehow limited—likely by zooplankton grazing.