DANE COUNTY WATER QUALITY PLAN
APPENDIX B UPDATE
SURFACE WATER QUALITY CONDITIONS

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Dane County Regional Planning Commission

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comparison with developed and intensively managed shorelines. "Noncritical" areas comprise seven percent of the total Lake Mendota shoreline and occur in three locations: 3 Cambridge Road to 607 Farwell Drive, 401 Woodward Drive to 801 Woodward Drive, and 3017 Diane Drive to 2903 Waconia Lane. Early herbicide treatments are permitted in these areas (WDNR, 1990b).

Lake Monona

Lake Monona covers 3,277 acres (5.1 square miles) and has a direct drainage area (excluding tributary streams) of 14.3 square miles. Tributary streams include the Yahara River, Starkweather Creek and Murphy (Wingra) Creek. The Yahara River provides most of the flow to the lake. Lake Monona has a maximum depth of 74 feet and flushes on the average of once/year. The lake contains an abundance of aquatic plants and experiences frequent blooms of blue-green algae. It thermally stratifies in the summer. Lake Monona supports a warm water fishery with a remnant population of cisco, a cold water species. The lake also supports a variety of "rough fish" species, with the most common being carp.

Lake Monona received heavy loads of municipal and industrial pollution until about 1950. This pollution increased the nutrient loading to the lake and contributed to nuisance conditions, especially algae blooms and associated odors. The lake has recovered significantly since 1950 because most point sources of pollution have been diverted or eliminated. However, past point sources of pollution and urban stormwater runoff have deposited heavy metals, such as lead and mercury, and organic compounds (e.g., PCBs) in the bottom sediments of the lake.

There generally have been improvements in water clarity, total phosphorus, and chlorophyll-a levels in Lake Monona since the mid-1970s (see Fig. B-9). Decreased phosphorus and algae in the water during 1977-89 is associated with lower than normal spring runoff in most years during this period. Sodium and chloride concentrations in the lake, however, have increased over the past 30 years, with chloride levels showing the greatest increase, from 15 mg/l in 1962 to 37 mg/l in 1990. Road salt use is associated with elevating the concentrations of these two constituents. Present levels of chloride and sodium are substantially below levels considered toxic to freshwater aquatic life, and increases at current rates should not be a concern for aquatic life in the foreseeable future.

Historically, water quality degradation in Lake Monona has led to a decline in the numbers and types of high-value aquatic plants in the lake. As the lake became more eutrophic, high-value plants were largely replaced by "weedy" species including coontail and Eurasian water milfoil. Densities of Eurasian milfoil became extensive in Lake Monona by the mid-1960s. Weed beds, dominated by milfoil, continued in large densities to the mid-1970s, decreased dramatically in 1976, and again increased from 1981 to 1989. A significant decline in milfoil has taken place since 1989.

The DNR has identified sensitive or critical areas in Lake Monona where aquatic plants are managed. The DNR has indicated that critical fish spawning habitats comprise nearly 95 percent of Lake Monona's shoreline (WDNR, 1990b). Herbicide treatments are prohibited in these areas until mid-June to protect fish spawning. "Non-critical" areas, where early herbicide treatments are permitted, comprise seven percent of the total shoreline and occur in three locations: 3,735 Monona Drive to 4100 Monona Drive, Winnequah boat landing to Tecumseh access point, and Brittingham Park to Bernie's Beach. The Olin Park shoreline, managed by the City of Madison Parks Department, is the least disturbed shoreline of the lake, and it is not to receive any herbicide treatments.

Compared with over 40 other inland lakes sampled in Wisconsin, deep water sediment in Lake Monona exhibits a high degree of mercury contamination. Peak mercury levels (1.9 mg/kg) in the sediment coincide with the time of direct municipal wastewater discharge into the Yahara lakes about 50 to 60 years ago. Compared with deeper sediment, surface layers sampled in 1972 contained lower mercury concentrations (1.1 mg/kg), indicating reduced mercury deposition following wastewater diversion from the lake. Sediment sampling in October 1988 indicated a continued trend of decreased mercury deposition with even lower concentrations (0.38-0.79 mg/kg) in surface sediment layers (Marshall, 1989). Mercury has bioaccumulated in walleyes in the lake, however, with concentrations exceeding recommended health standards in some fish that have been tested. Because of this, Lake Monona was placed on the Wisconsin Fish Consumption Health Advisory List in 1987.

PCBs are widely distributed in Lake Monona sediment, but the level of contamination (PCB range: 0.05-0.77 ug/g) is relatively low compared to other PCB contamination sites around the state. Highest PCB concentrations have been found in the sediment on the north side of Monona Bay. This site also exhibits high mercury levels, with a possible source for the contaminants being a large storm sewer outfall located 200 feet away.