

# Non-Point-Source Pollution Affecting Asylum Lake

by

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In 1976, the State of Michigan gave to Western Michigan University the land formerly occupied by the Alamo State Hospital Farm. Asylum Lake was included in the transfer and it was stipulated that the area be used for research and passive recreation.

Asylum Lake is generally thought to be of relatively good quality and an asset for the University. Changes in the surrounding area, however, may be creating problems for the lake. The first major change was the construction of U. S. 131 to the west in 1963. Later, between 1974 and 1976, Stadium Drive north of the lake was widened to five lanes and the West Towne hopping center built. These developments could affect Asylum Lake because their run-off is directly into the lake. The construction of U. S. 131 also disturbed the each bed of the sanitary system for a mobile home park located between U.S. 131 and Asylum Lake. Seepage from this system could be entering a stream that flows along the south side of the park into the west end of the lake.

Water tested from the stream at Station II (Fig. 1) contained a sample mean (average) of 1.99 mg/l inorganic nitrogen; samples from the ditch contained a mean of 1.43 mg/l, and samples from the storm sewer ranged from 1.33 mg/l to 8.66 mg/l. The mean concentration of orthophosphate in the samples at Station II was 0.24 mg/l; in the ditch it was 0.14 mg/l. Orthophosphate at Station III varied between an undetectable amount and 3.21 mg/l.

The significance of these nutrient concentrations becomes apparent when compared to those of Barton Lake. Barton Lake is one of the more culturally eutrophic lakes in Kalamazoo County. It is reported to have a mean inorganic nitrogen concentration of 0.985 mg/l and a mean phosphate concentration of 0.093 mg/l (U. S. Environmental Protection Agency, 1975). Thus, the examined sources of water for Asylum Lake would seem to be capable of causing a highly eutrophic condition.

Samples collected from the stream had fecal coliform counts as high as 430/100 ml. This suggests that much of the nutrients in the stream was probably emanating from the trailer park's septic system. By the end of 1976, the Kalamazoo County Health Department condemned the system. Although the sewage is now being trucked to the Kalamazoo Waste Treatment Plant (Akers, 1977), the problem has not been solved and high fecal coliform counts were obtained as late as May of 1977, indicating continued contamination.

Excessive chloride levels were also recorded. Run-off during the winter produced chloride concentrations as high as 19,000 mg/l due to extensive salting of the roads in the area. High chloride concentrations of 197 mg/l were detected in spring water, Station I, in the summer. The Federal Water Pollution Control Administration recommends 25 mg/l as the desirable limit for chloride in surface waters used for public water supplies.

The storm sewer water had lead concentrations ranging from 1.3 mg/l to 3.3 mg/l. These levels could be a threat to the ecosystem as the lead accumulates in the lake sediments. It could enter the food chain of the lake through organisms such as some midge larvae (Jones, 1958) and some bacteria (Tornbene and Edwards, 1977) which feed in the sediments and are resistant to lead toxicity. They may concentrate the poison in their bodies and then pass it up the food chain. Determination of a diversity index for aquatic invertebrates indicated moderate pollution.

Thus non-point-sources of pollution are important factors in the future of Asylum Lake. Increased cultural eutrophication seems to be the major problem and could greatly reduce the quality of the lake.



Asylum Lake A



Dr-icing salt and other runoff enter Asylum Lake A

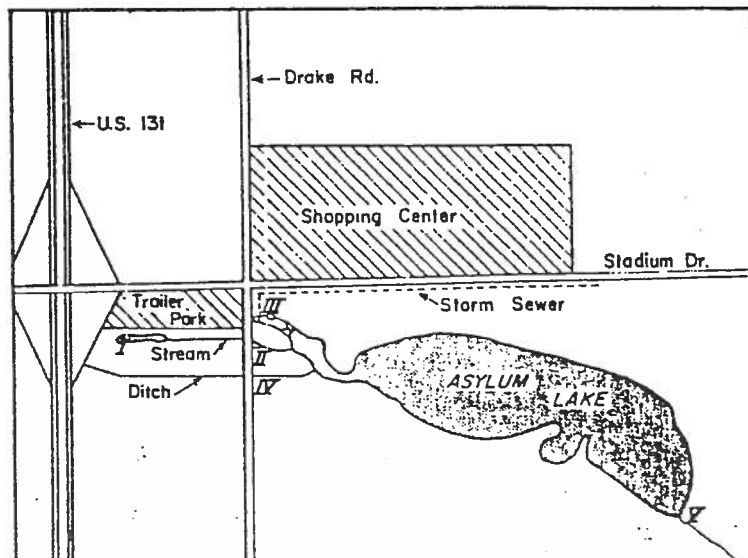


Figure 328.--The Asylum Lake area. ▶