Project Summary

WATER QUALITY, AQUATIC VEGETATION & WATERSHED MONITORING, WITH MANAGEMENT RECOMMENDATIONS
ASYLUM LAKE AND LITTLE ASYLUM LAKE, KALAMAZOO, MICHIGAN

Western Michigan University (WMU), on behalf of the Asylum Lake Policy and Management Council, authorized Kieser & Associates, LLC (K&A) to initiate a study of Asylum Lake and Little Asylum Lake beginning in July 2006. The purpose of this effort was to develop a robust understanding of current lake conditions, identify in-lake and watershed factors influencing water quality and recommend strategies for long-term management and improvements. A range of efforts was conducted by K&A that included:

- Watershed delineation and assessment of runoff contributions
- Identification of stormwater pollutant sources and loading estimates
- Water quality monitoring (seasonal and wet weather)
- Stormwater inlet and lake outlet sampling
- Sediment sampling
- Aquatic plant surveying
- Development of a hydraulic mass balance
- Development of a phosphorus mass balance
- BMP recommendations and preliminary stormwater treatment concepts

K&A project findings revealed the following:

- Stormwater pollutant inputs from storm sewered areas to the west and north of Asylum Lake constitute the largest source of external loading that can be managed through controls.
- Water quality conditions in both lakes suggest these systems can be characterized as eutrophic based on phosphorus, chlorophyll *a* and Secchi disk measurements.
- Rapid onset of anoxia is attributable to organically enriched sediments that exert a high sediment oxygen demand on overlying waters.
- High phosphorus and nitrogen concentrations in sediment samples suggest significant retention and accumulation of these materials.
- Eurasian water milfoil and purple loosestrife are invasive species in Asylum Lake. Curly leaf pondweed is the predominant invasive aquatic macrophyte in Little Asylum Lake.
- The most pressing water quality/watershed management issue is controlling stormwater loads from highly developed storm sewered drainage areas.

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$55,000

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2006 - 2008