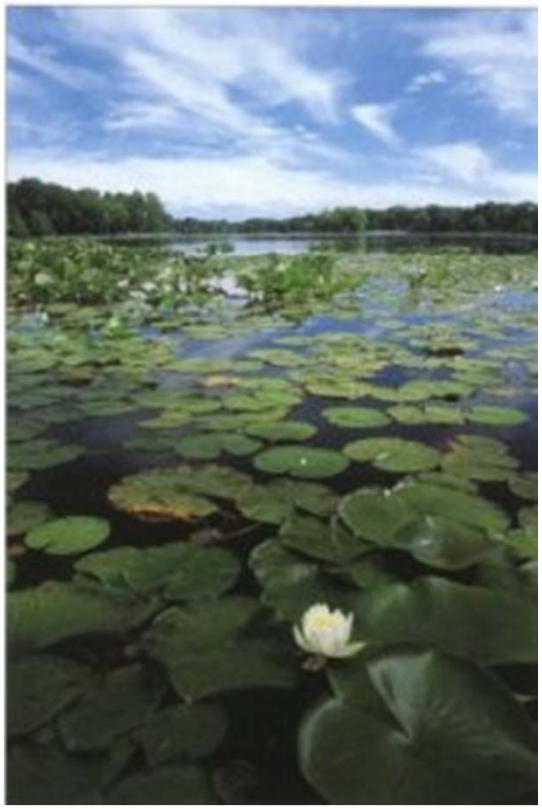

Silver Lake Water Quality

Presentation to Silver Lake Village Council by Silver Lake Estates Trustees

April 21, 2014

Purpose

- Inform Silver Lake Village (SLV) council and officials of current actions taken to address Silver Lake water quality (WQ) issues
  - Establishment of WQ task force
  - Development of WQ action plan

- Request Silver Lake Village ongoing support
  - Community education and engagement
  - Control nutrient input from SLV watershed
  - Guidance to task force

Silver Lake Water Quality

In 2012 EnviroScience, Inc. (ES) was contracted by the Silver Lake Estates Board of Trustees for lake diagnostic services to evaluate current in lake conditions and guide future management programs in Silver Lake. In addition to determining the current condition of the lake's water quality and aquatic plants, the study evaluated the operation of the existing hypolimnetic aeration system.

Study Findings & Conclusions

- Study found that the lake is **highly eutrophic (nutrient rich)**
- Several species of toxin-producing **algae** were found, algal toxin concentrations were at acceptably low levels
- High levels of nutrients entering from the **watershed** and cycling from the sediment is responsible for nuisance levels of algae seen in recent years
- **Monitoring** for algal toxins on a periodic basis is highly recommended due to the potential threat toxins pose
- *A combination of watershed controls and in-lake management options should be investigated*
- **Watershed options** should include community involvement and may involve active stormwater controls and treatment
- In-*lake options could include whole lake circulation/aeration, phosphorus inactivation, and chemical treatment*

7-step WQ Action Plan

1.	Study Silver Lake Water Quality	Complete
2.	Ongoing Monitoring of WQ	Monthly
3.	Educate and engage SLV residents	In-process
4.	Identify possible solutions to improve WQ	Completed
5.	Research/prioritize solutions (based on cost, impact, benefit and complexity)	In-process
6.	Decide on solutions and timing	
7.	Implement solutions	

Education and Engagement

- Host town-hall education meeting — May 2014
- Solicit resident involvement — May 2014
- Form teams to: — May 2014
  - Drive grass-roots education
  - Participate in solution evaluation
- Provide input to SLE board/SLV — Ongoing

In-Process Actions*

1. Management of nutrient input
   - *Community education regarding use of phosphorus-based fertilizer*
2. Fish management
3. Aeration – current system inadequate
4. Annual lake water drawdown

Source of possible solutions: Citation : Holdren, c., W. J o n e s , and J. Taggart. 200 I. Managing Lakes and Reservoirs. N. Am. Lake Manage. Soc. and Terrene Inst., in coop. with Off. Water Assess. Watershed Prot . Div. U.S. Environ. Prot. Agency, Madison, WI.

Solutions for Evaluation*

1. Management of nutrient input
   - Additional strategies to phosphorus-based fertilization
   - Storm water filtration
2. Flushing
3. Enhanced aeration
4. Water circulation and de-stratification
5. Phosphorus inactivation (inert chemical binding agents)
6. Settling agents
7. Sonication

Source of possible solutions: Citation : Holdren, c., W. J o n e s , and J. Taggart. 200 I. Managing Lakes and Reservoirs. N. Am. Lake Manage. Soc. and Terrene Inst., in coop. with Off. Water Assess. Watershed Prot . Div. U.S. Environ. Prot. Agency, Madison, WI.

Silver Lake Village Participation

- Support Community Education and Engagement
  - Newsletters and other written/electronic notices
  - Posting materials on website
  - Town hall meeting support
- Storm water management
- Guidance to task force