Proposals for the Sylvan Lake Watershed

Prepared for the
Sylvan Lake Watershed Stewardship Society

1. Design a Long Term Water Quality Data Collection Plan

This task will critically review existing lake and watershed data and design a new water sampling and analysis plan that will ensure that any changes to water quality variables are detected and recorded.

The protocol will specify the number, frequency and location of water samples required to monitor Sylvan Lake while minimizing the cost of sampling, analysis and reporting.

Long term monitoring of Sylvan Lake is necessary to confirm the condition of the lake and to provide the right information for lake management decisions. Baseline data have already been compiled in several technical reports[1,2]

Cost Estimate: $3,000.

2. Measure and Report on Sylvan Lake Water Quality

The cost of implementing Task 1 will be determined by the scope of the on-going requirement to implement the proposed new protocol. The total number of water samples and the specifications for water analyses by a qualified laboratory will determine the cost of this sampling campaign.

Cost Estimate and Limit: $10,000 per year.

3. Measure Flow Rates and Sample Sylvan Lake Tributaries

Flow rates of the principal tributaries will be measured and logged and water samples will be collected for analysis according to the protocol of Task 1 above. Instrumentation for flow rate measurement and data logging will be required.

Tributary or stream flows into Sylvan Lake are known to carry dissolved and suspended materials into Sylvan Lake. Flows are unsteady and the composition of the tributary waters varies seasonally. Both flow and composition must be measured over time to determine the loading of the lake with nutrients and other components. Correlations with land use in the watershed adjacent to the tributaries and with precipitation will be sought so that monitoring can be reduced with time and experience.

Cost Estimate: $10,000

4. Conduct Research on Internal Loading by N and P Nutrients in Sediments

Recommendations of the AXYS 2005 report on sediment and water-column sampling will be implemented to assess the potential for an increase in the release of dissolved nutrients by internal loading caused by chemical and biological processes.

Experts have advised that the legacy risk to Sylvan Lake and its water quality caused by the build-up of nutrients in the lake over time requires additional investigation. Studies have shown that surface flows and seepages can add nitrogen and phosphate to the lake. In addition, nutrients trapped by the lake sediments may release forms of N and P that can promote growth of algae and overall eutrophication.

Cost Estimate $20,000

5. Survey and Report on Lake and Tributary Riparian Zones

This task will extend the land use evaluation of the AXYS 2005 report by detailed analysis of the distribution and classification of riparian zones within the watershed and the potential for contaminant control. Expert organizations like Cows and Fish and Ducks Unlimited will be consulted on the detailed scope of this land use and tributary water quality analysis.

Riparian zones that bound Sylvan Lake and its tributaries are important natural filters and sinks for potential lake water contaminants and nutrients. Changes to land use within the watershed, like transformations from agricultural to urban, can adversely affect riparian zones.

Cost Estimate: $20,000

6. Initiate Action on Best Land Management Practices

The SLWSS recommends that the National Agri-Environmental Standards[3] and Best Management Practices (BMPs) developed by agricultural agencies be promoted within the watershed by a series of educational, outreach and demonstration projects.

Early prevention of any degradation to Sylvan Lake water quality starts on shore and upstream in the watershed.

Experts within the Red Deer and Lacombe Counties, Agriculture Canada, and Cows and Fish will be invited to assist in defining a program for the Sylvan Lake Watershed and to assist with the implementation of new techniques that will minimize nutrient runoff that might contaminate the lake.

Application of specific best management practices in the watershed requires essential information related to current land and lake uses. Knowledge of specific watershed and lake use activities, including the industrial infrastructure, and the various stakeholders involved is essential. Applying standard risk identification and assessment will allow the identification of key risks and the targeting of actions to facilitate either avoidance strategies and or mitigation via application of BMP's.

Cost Estimate: $10,000

7. Communicate and Market Watershed Protection

The goal of this task is to support the creation of awareness, interest, trial and adoption of vital behaviors and practices among residents and visitors to the watershed. Protecting the value of Sylvan Lake requires the adoption of a wide range of specific vital behaviors by the watershed community and lake users. Communications in form of information based newsletters, web site content development and distribution, public forums and supporting outreach activities. Specific communications on watershed protection progress, including significant focus of success stories and testimonials is anticipated.

Cost Estimate: 20,000-25,000/year.

8. Summary of Recommendations from the AXYS 2005 Report and 2008 Actions Proposed by the SLWSS

Immediate Term	***Status***	***SLMP Action Required***
1) In addition to existing environmental setback requirements from the high water mark of the lake shore, the same "no development" setback should be assigned to all streams, as well to the boundaries of all wetlands occurring on or adjacent to a development site		Check and report on bylaws, regulations, case histories
2) All new development should be required to install communal holding tank systems, rather than septic fields.		Check and report on bylaws, regulations, case histories
3) Lawn and garden restrictions should be implemented as part of purchase conditions for development lots immediately adjacent to the recommended "no development" reserve for the lake, inflow streams and wetlands.		Check and report on bylaws, regulations, case histories
4) Storm water run-off should not be permitted to empty directly into the lake, streams or localized standing water bodies on or adjacent to the development site without first passing through a detention pond where some ground infiltration and sedimentation reduction can occur.		Check and report on Town of Sylvan Lake, Summer Village and County systems
5) Storm water detention ponds should have the capacity to reduce post development peak run-off rates to pre-development levels for the developed area		Check and report on Town of Sylvan Lake, Summer Village and County systems
6) Periodic monitoring of water quality parameters in the detention pond should be undertaken to identify potential nutrient or contaminant issues		Check and report on Town of Sylvan Lake, Summer Village and County systems

Medium to Long-Term		
1) Protect the upstream reaches of streams in the sylvan lake watershed to effectively manage cumulative nutrient loads through regional initiatives such as the Alberta Riparian Habitat Management Society Cows and Fish program		See new SLWSS Tasks 1, 2, 3
2) To maintain the lake's water balance, consideration should be given to returning treated sewage back into the lake drainage basin from the town and future developments, provided that nutrient levels in the treated sewage can be reduced to acceptable levels that won't add to a nutrient loading problem.		Check on status of regional projects
3) Continue to monitor septic field performance in the Summer Villages, and identify a regional body with appropriate authority in the counties to monitor field performance and identify potential problem sites		Check on regulatory action
4) Develop an adaptive nutrient management strategy for Sylvan Lake to assist in responsible watershed planning and development to protect water quality		See new SLWSS Tasks 2, 3, 4, 5
Best Management Practices		
1) Consideration should be given to the implementation of a number of additional best management practices that are widely promoted by provincial and federal agencies for the protection of land and water values.		See new SLWSS Tasks 6, 7

[1] Assessment of Water Quality in Sylvan Lake. Alberta Environment.1999.
[2] Sylvan Lake Water Quality Assessment and Watershed management Considerations. AXYS. 2005.
[3] National Agri-Environmental Standards. Technical Report Series-NAESI. 2008