Board of Directors Notice *of Meeting*

November 10th - 10:00 a.m., Administration Office, Strathroy

Tentative Agenda

1. Chair's Remarks
2. Declaration of Pecuniary Interests
3. Minutes
4. General Manager's Report
   - (i) GM's Report
5. Chair & Conservation Ontario Report
   - (i) CO September 26, 2016 minutes
6. Business Arising from last meeting
7. Conservation Area Reports
   - (i) Conservation Lands Update
   - (ii) Highland Glen Boat Ramp
8. Water Resources Reports
   - (i) Current Watershed Conditions
   - (ii) WECI Projects
9. Biology Reports
   - (i) Lambton Shores – Healthy Lake Huron program
   - (ii) Fish Community Surveys
   - (iii) Outreach Activities
   - (iv) Watershed Report Cards
10. Conservation Services Report
    - (i) Conservation Services Programs
11. Planning & Research Reports
    - (i) Regulations Committee Report
    - (ii) Coastal Review of Development applications
    - (iii) 1992 Shoreline Protection Structures
    - (iv) DART report
    - (v) Planning Activity Summary Report
    - (vi) St. Clair River AOC

12. Finance Reports
    (i) Revenue & Expenditure Report
    (ii) September - October Disbursements
    (iii) General Levy Update
    (iv) Investment Report
    (v) 2016 Fees
    (vi) Apportioning of Matching and Non-Matching general levy for 2016
    (vii) 2016 Preliminary Forecast Budget
    (viii) Joint Health & Safety Minutes
    (ix) 2016 Nominating Committee
    (x) 2016 Meeting Schedule
    (xi) AODA Training
13. Communications Reports
    (i) Communications Report
    (ii) Education Report
    (iii) 5 Year Strategic Plan
14. Source Protection
15. In Camera
16. New Business
17. Adjournment

Please contact Marlene (call 519-245-3710, 1-866-505-3710 or e-mail mdorrestyn@scrca.on.ca) at the Administration Office by November 8, if you are unable to attend.

November 10, 2016

Board of Directors Proposed Resolutions

2. It is requested that each Director declare a conflict of interest at the appropriate time, on any item within this agenda in that a Director may have pecuniary interest.

3. (i) Moved by: Seconded by:
That the minutes of the Board of Directors meeting, held September 15, 2016, be approved as distributed.

4. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the General Manager's report, dated November 1, 2016.

5. (i) Move by: Seconded by:
That the Board of Directors acknowledges the September 26, 2016 meeting minutes of Conservation Ontario.

6. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the updates on business arising from the September 15, 2016 Board of Directors meeting.

7. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the Conservation Lands Update, dated October 24, 2016 on Conservation Area maintenance and development, McKeough Upstream Lands and management activities on Lambton County Lands.

7. (ii) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 25, 2016 on the Highland Glen boat ramp and seawall project.

8. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 27, 2016 on the current watershed conditions and Great Lakes water levels.

8. (ii) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 27, 2016 on the ongoing Water and Erosion Control Infrastructure projects across the watershed.

9. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the status report dated November 1, 2016, regarding Healthy Watersheds program, including the outreach and education events held throughout the watershed.

9. (ii) Moved by: Seconded by:
That the Board of Directors acknowledges the status report dated October 25, 2016, regarding Fish Community Surveys conducted in 2016 through partnerships with Ontario Trillium Foundation via Friends of the St. Clair River and DFO.

9. (iii) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 25, 2016 on the recent outreach activities for the Education Outreach Program in the St. Clair Region.

9. (iv) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 26, 2016 on watershed report cards.

10. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated November 1, 2016 on the Conservation Services programs and projects across the watershed.

11.(i) Moved by: Seconded by:
That the Board of Directors acknowledges and concurs with the Regulations Activity Summary Reports on "Development, Interference with Wetlands & Alterations to Shorelines & Watercourses" Regulations (Ontario Regulation 171/06), for September and October, 2016 and further acknowledges the shoreline "in water and nearshore works" currently being investigated.

11. (ii) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 31, 2016 on high lake levels and erosion, ongoing litigation and SCRCA's Coastal review of Development applications, and further approves the minor revisions to current SCRCA staff review policy and that staff be directed to make the revisions.

11. (iii) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 26, 2016 on the request to update the 1992 Shoreline Protection Structures landowner resource manual and approves this as a 2017 SCRCA project with provincial grants allocated and further that the remaining funds are to be allocated to the Lake Huron shoreline municipalities as outlined, subject to funding approval from Lake Huron Shoreline municipalities and further directs staff to add this project to the Authority budget for 2017.

11. (iv) Moved by: Seconded by:
That the Board of Directors acknowledges and concurs with the August to October 2016 municipal drain activity report associated with the Drainage Act and Conservation Authorities Act Protocol (DART).

11. (v) Moved by: Seconded by:
That the Board of Directors acknowledges the St. Clair Region Conservation Authority's monthly Planning Activity Summary Reports for August and September, 2016.

11. (vi) Moved by: Seconded by:
That the Board of Directors acknowledges the update dated October 26, 2016 on the St. Clair River Area of Concern.

12. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the revenue and expenditure report to September 30, 2016, as it relates to the budget.

12. (ii) Moved by: Seconded by:
That the Board of Directors approves the September and October 2016 disbursements as presented in the amount of $782,265.65.

12.(iii) Moved by: Seconded by:
That the Board of Directors acknowledges the status report on the 2016 general levy receipts to October 31, 2016.

12.(iv) Moved by: Seconded by:
That the Board of Directors acknowledges the Investment Report, for the period ending September 30, 2016.

12. (v) Moved by: Seconded by:
That the Board of Directors acknowledges the report on Conservation Area fees and approves the Schedule of Fees dated October 2016, for all programs and services for the year 2017 fees and further directors staff to circulate the approved fee schedule to all member municipalities.

12. (vi) Moved by: Seconded by:
That the Board of Directors approves the apportioning of matching and non-matching general levy to member municipalities for 2017 as per Schedule A, using the Modified Current Value Assessment, values provided by the Ministry of Natural Resources in October 2016.

12. (vii) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated November 1, 2016 and verbal summary of comments received to date on the 2017 Draft Budget.

12. (viii) Moved by: Seconded by:
That the Board of Directors acknowledges the June 8, 2016 meeting minutes of Joint Health and Safety Committee.

12. (ix) Moved by: Seconded by:
That the 2017 Nominating Committee consisting of the following four directors representing the four districts of the Authority being Sarnia, Lambton, Chatham-Kent, and Middlesex be: _____ and further that the Nominating Committee's recommendation for the 2017 membership be presented at the Annual General Meeting.

12. (x) Moved by: Seconded by
That the Board of Directors approves the 2017 tentative schedule of meetings for the Board of Directors and Committees, dated October 18, 2016.

12.(xi) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 31, 2016, on AODA IASR Training and further that any director who has not completed this training, do so by November 18, 2016 and provide a copy of the completed testing to the Authority for required record keeping.

13. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the Communications Report dated October 26, 2016 including memorial forests, conservation awards, Conservation Foundation update and conservation education fundraising.

13. (ii) Moved by: Seconded by:
That the Board of Directors acknowledges the Conservation Education Report, dated October 28, 2016 including fall education programs and events.

13. (iii) Moved by: Seconded by:
That the Board of Directors acknowledges the report dated October 28, 2016 and further approves the 5-year Strategic Plan entitled Our Future to Shape – A Way Forward.

14. (i) Moved by: Seconded by:
That the Board of Directors acknowledges the report, dated November 1, 2016, on Drinking Water Source Protection.

15. (i) Moved by: Seconded by:
That the Board of Directors go in camera at _____ a.m. to discuss personnel issues with the General Manager and Director of Finance remaining.

15.(ii) Moved by: Seconded by:
That the Board of Directors rise and report at _____ a.m.

17. Moved by: Seconded by:
That the meeting be adjourned.

Staff Report

4.(i)

To: Board of Directors
Date: November 1, 2016
From: Brian McDougall, General Manager
Subject: General Manager's Report

Environmental Awareness Award

- on October 20th, Strathroy & District Chamber of Commerce hosted it's annual Gala Awards Celebration
- in 2012, the Authority was awarded the Community Involvement Award
- this year, the Authority was nominated for the TD Environmental Awareness Award
- Chair Arnold proudly accepted the Award for the Authority

Agriculture Sector Working Group

- a large group of representatives from agriculture and adjacent agriculture organizations formed by Ontario Ministry of Agriculture, Food and Rural Affairs to provide input to OMAFRA regarding proposed agricultural components of the Domestic Action Plan to reduce phosphorous levels in Lake Erie
- 5 Conservation Authorities have been active participants with the Group
- OMAFRA has requested a meeting with Conservation Authorities to discuss what CAs do now regarding efforts to reduce phosphorous run-off and what CAs could do if more resources were available and to review some ideas about what OMAFRA would like to see CAs do
- the meeting is scheduled for November 14th at the Upper Thames Watershed Conservation Centre

Upcoming Events

- Shoreline Information Night
  - for Reach 5 (Haight Road East to Hillcrest Nisbet Drive - Sarnia)
  - Dynamic Beach Assessment
  - Monday November 14, 2016 4:00 pm – 8:00 pm
  - Real Canadian Superstore, Upper Meeting Room
  - 600 Murphy Road, Sarnia

- 2017 Annual General Meeting
  - February 16, 2017 – 10:00 am
  - Brooke – Alvinston – Inwood Community Centre Auditorium
  - 3210 Walnut Street, Alvinston
  - meeting to be followed with Lunch

SMALL STEPS FORWARD

Environmental Protection Report 2015/2016

EXECUTIVE SUMMARY

Download the full report at:
eco.on.ca/reports/2016-small-steps-forward

Environmental Commissioner of Ontario

Executive Summary

The Environmental Commissioner of Ontario (ECO) is the guardian of the *Environmental Bill of Rights (EBR)*, and reports to the Ontario Legislature, and to the public, on energy conservation, climate change and environmental protection.

This report focuses on two questions:

1. Do the environmental rights of Ontarians get enough respect? (Volume 1); and
2. How well do recent Ministry of Natural Resources and Forestry (MNRF) initiatives conserve biodiversity? (Volume 2)

Environmental Rights
The environmental rights of Ontarians need more respect.

There has been meaningful progress since December 2015. As we showed in our Special Report *EBR Performance Checkup: Respect for Ontario Environmental Rights 2015/2016*, Ontario government ministries worked hard this year to improve their compliance with the *EBR*.

This was welcome and overdue. In 2015, ministries had 1,800 outdated proposal notices on the Environmental Registry reaching as far back as 1996. By the summer of 2016, more than 1,000 of these outdated notices had been brought up to date. New notices from some ministries became of better quality and more helpful to the public. We welcomed the Treasury Board Secretariat as our 15th prescribed ministry.

The Ministry of the Environment and Climate Change (MOECC) makes the largest number of environmentally significant decisions and should set a good example in respecting environmental rights. The ECO is glad to see that the MOECC has, at last, begun posting public progress updates on its outstanding applications for review. The MOECC has also begun a long-overdue review of the *Environmental Bill of Rights* itself. These initiatives are important and appreciated. However, much remains to be done:

1. The Environmental Registry, Ontarians' window on significant government environmental decisions, is hobbled by obsolete software and often frustrates public participation.
2. The MOECC is still responsible for more than 400 outdated Environmental Registry proposals, depriving Ontarians of their legal right to seek leave to appeal on many controversial and important environmental decisions.
3. The MOECC has not completed *EBR* reviews from as far back as 2009, leaving Ontario residents hanging and important policy issues unresolved. One relates to the shameful impact of Sarnia's air pollution on the health of the First Nations community of Aamjiwnaang and other similar air pollution hotspots.
4. When the MOECC "completes" a review, it does not always deliver what it promised. For example, the MOECC agreed in July 2015 that the public deserves to know when raw sewage is dumped into Toronto's harbour. When it happened again in August 2016, the public didn't receive notice.

By next year's report, the MOECC should earn Ontarians' trust by respecting and protecting Ontarians' environmental rights.

The MNRF and Biodiversity
The MNRF is responsible for almost all of Ontario's biodiversity, including the plants, animals and natural landscapes for which we are famous around the world. This biodiversity is coming under increasing threat as climate change accelerates. The MNRF has important new tools this year to conserve our biodiversity: a new *Invasive Species Act, 2015*, a new *Wildland Fire Management Strategy*, and new moose management measures. These are good steps in the right direction.

But will MNRF "walk the talk"?

Unfortunately, the MNRF often fails to use its tools to provide effective conservation for Ontario's species. We have seen instances where the MNRF:

1. Did what was easiest and cheapest, instead of what works;
2. Hoped for the best instead of collecting the data that is essential for effective species protection; and
3. Relied on others to do the work it should do, or used to do, without providing them with leadership, co-ordination, funding or accountability.

The impact was substantial:

1. Invasive species continued to be a serious threat while some practical and inexpensive precautions were ignored;
2. Years of fire suppression impaired the ecological health of our forests and increased the risk of catastrophic fires; and
3. Important wildlife populations like moose, bats and amphibians declined.

Prescribed Ministry	Quality of Notices Posted on the Environmental Registry	Timeliness of Decision Notices and Avoiding Outdated Proposals	Handling of Applications for Review and Investigation	Considering Statements of Environmental Values (SEVs)	Co-operation With ECO Requests
MOECC					
MNRF					

Excerpt from ECO Special Report, *EBR Performance Checkup: Respect for Ontario Environmental Rights 2015/2016*

Ontario needs an overall, big picture assessment of our biodiversity. It's the MNRF's job to provide one, but it doesn't.

Ontario needs an overall, big picture assessment of our biodiversity. It's the MNRF's job to provide one, but it doesn't.

The MNRF, like other ministries, struggles to fulfil its many mandates within the constraints of limited resources, and amid the demands of many stakeholders. But the MNRF can, and must, take its biodiversity duties more seriously. It has new tools. Will it use them well?

Walking the Fire Line: Managing and Using Fire in Ontario's Northern Forests

Ontario's forests need regular renewal by fire. But Ontario doesn't allow enough managed fire in our Crown forests to provide ecological benefits and prevent future catastrophic fires. The MNRF took a step in the right direction with a new *Wildland Fire Management Strategy* that could allow more fires to be left to burn in northern Ontario. Now the MNRF needs to let such fires burn when and where they are needed and appropriate, even if this means the loss of some potentially harvestable timber:

- Forest fires are necessary for the ecological health of Ontario's forests, particularly to enable a diversity of species types and age classes.
- Long-term fire suppression can result in older forests that are burdened with excess fuel loads, and more susceptible to catastrophic and uncontrollable fires such as the one in Fort McMurray.

A strong focus on protecting standing timber for possible future use by the forestry industry has traditionally been a substantial obstacle to restoring natural fire cycles. The MNRF has not yet faced up to the trade-offs between these two objectives.

Regular fire cycles have particular importance in protected areas such as provincial parks, which must conserve Ontario's biodiversity. Unfortunately, these areas are starved of fire because Ontario Parks lacks the resources to manage prescribed burns, and the MNRF as a whole will not assist them without payment. This is penny wise and pound foolish.

With climate change gathering speed, northern Ontario communities should increase their resistance and resilience to forest fire. The Ontario government should ensure all communities near flammable forest become "FireSmart."

Jack Pine regeneration in Woodland Caribou Provincial Park after the spring 2016 forest fire. Source: Ontario Parks.

Invasive Species Management in Ontario: New Act, Little Action

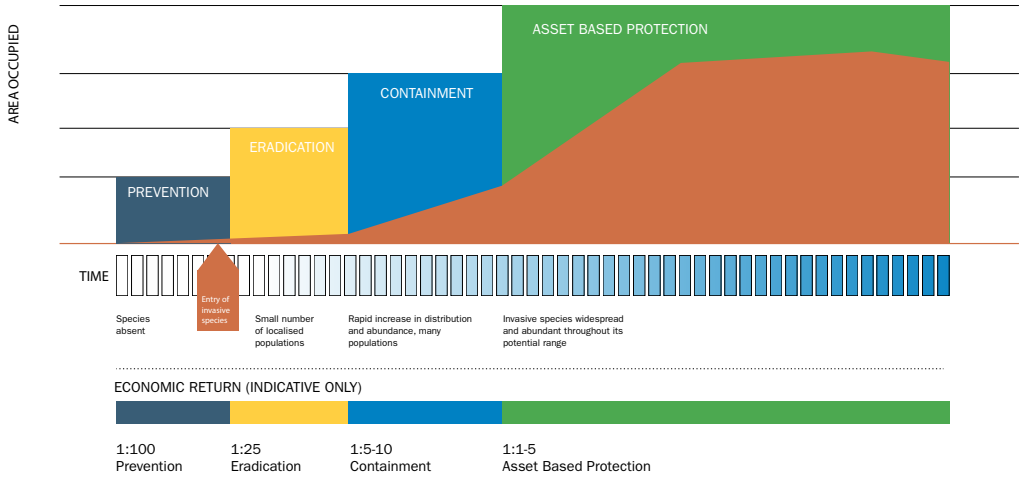
Invasive species have huge economic, social and health effects, and are among the biggest threats to biodiversity. Ontario has Canada's highest risk of invasions by non-native species (e.g., emerald ash borer, Phragmites, zebra and quagga mussels, and Asian carp). Up to 66 per cent of Ontario's species at risk are already threatened by established invaders such as garlic mustard (a forest herb), Phragmites (a grass), and round goby (a fish).

Ontario's new *Invasive Species Act, 2015*, and the 2012 *Ontario Invasive Species Strategic Plan* are useful tools for managing invasive species. But the MNRF is taking few concrete actions to prevent the introduction of invaders, detect them early, or manage and monitor species that are already doing damage. Worse, the MNRF is failing to take basic precautionary steps to block known pathways by which some invasive species spread.

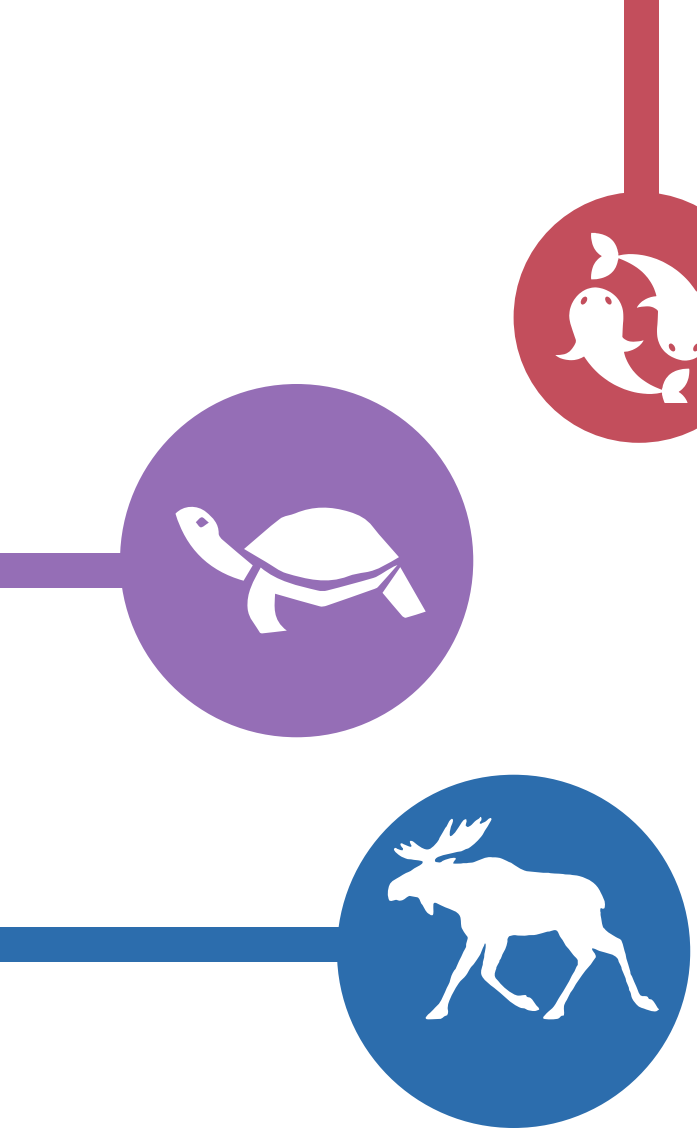
Instead, the MNRF is mostly leaving the hard front-line work to municipalities, conservation authorities and private landowners, without provincial guidance, co-ordination, expertise or predictable funding. The MNRF is not collecting enough data to know which threats are the most urgent, and which control measures work best.

The MNRF should:

- restrict known pathways of invasive species spread;
- tackle invasive species in provincial parks;
- establish advisory panels with scientific expertise and local and Aboriginal knowledge; and
- report publicly on progress in managing invasive species.



Generalized invasion curve showing actions appropriate to each stage. © State of Victoria, Department of Economic Development, Jobs, Transport and Resources. Reproduced with permission.

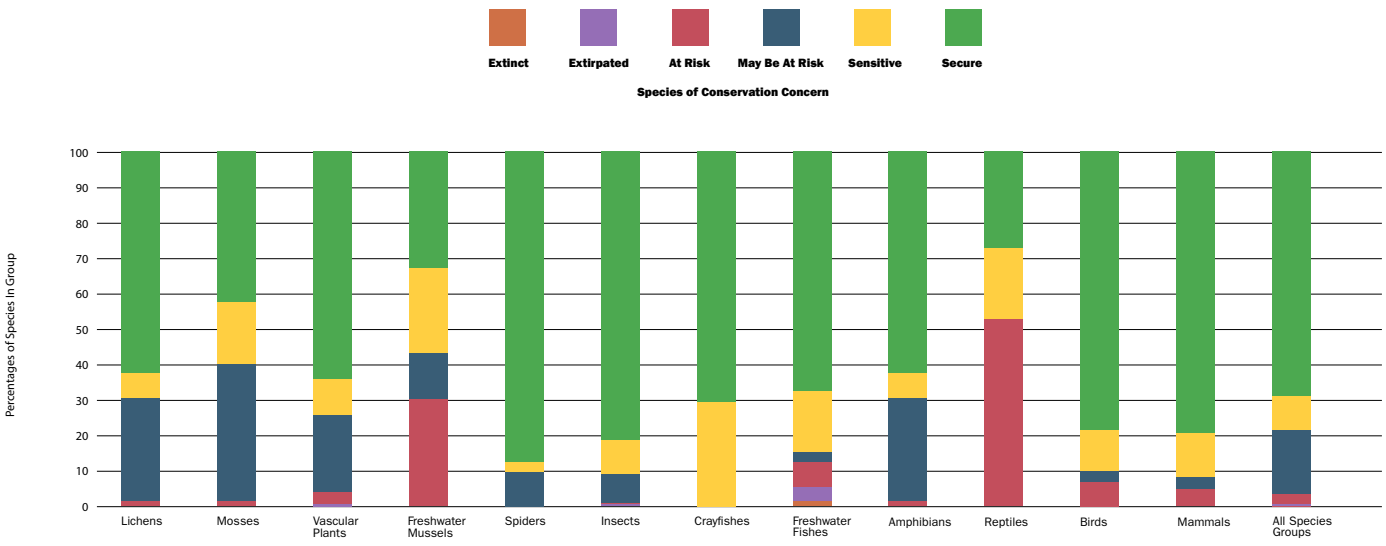


Biodiversity Under Pressure: Wildlife Declines in Ontario

The large-scale loss of biodiversity is a crisis in Ontario and around the world. As well as invasive species, the biggest threats are human-caused habitat loss and degradation, and disease, with climate change playing a growing role. The declines of moose, bats and amphibians in Ontario demonstrate that the Ministry of Natural Resources and Forestry needs to act urgently on habitat protection and biodiversity monitoring.

Ontario's Declining Moose Populations

Moose are an iconic Ontario species with particular cultural and economic significance. However, Ontario's moose are in trouble. There are now about 92,300 moose – down about 20 per cent in the last decade. In nearly half of Ontario moose management units, too few calves are reaching adult breeding age to keep the population stable.



Proportion of Ontario native wild species in secure and conservation concern categories. Source: Ontario Biodiversity Council (2015). *State of Ontario's Biodiversity*. Available at: http://ontariobiodiversitycouncil.ca/sobr.

The declines of moose, bats and amphibians in Ontario demonstrate that the Ministry of Natural Resources and Forestry needs to act urgently on habitat protection and biodiversity monitoring.

Source: Ryan Hagerty, U.S. Fish and Wildlife Service

There are many pressures on moose, including habitat degradation, disease and parasites (e.g., winter ticks, liver fluke, brainworm), hunting, predation and weather. Climate change is an increasingly serious threat.

The MNRF's Moose Project included changes to moose harvesting rules, and an ill-advised proposal (since abandoned) to increase the hunting of wolves and coyotes. However, the new restrictions on harvesting moose may not prevent further population declines. Ontario has approximately 98,000 licensed moose hunters – more than one licensed hunter for every moose in Ontario – plus Aboriginal peoples with a constitutional or treaty right to take moose without a licence. Based on the MNRF's estimates:

Climate change is an increasingly serious threat.

Moose Population Decline	Adult Moose Harvest (2014)	Calf Moose Harvest (2014)
-22,700 since early 2000s	Legal limit: 13,499 tags	Legal limit: one for each of the 98,000 licensed hunters
	Estimated resident harvest: 3,020	Estimated resident harvest: 1,403
	Aboriginal harvest: Unknown	Aboriginal harvest: Unknown
	Tourism industry harvest: 601	Tourism industry harvest: 26

A little brown bat infected with white-nose syndrome Source: Ryan von Linden/New York Department of Environmental Conservation used under CC BY 2.0.

White-nose Syndrome: Tragedy of the Bats

Ontario's bats are important predators of mosquitoes and other insects. Since 2010, millions of them have died from an invasive fungal disease called white-nose syndrome. As a result, four of Ontario's eight native bat species have become endangered. Bat populations across eastern North America are collapsing. There is no known treatment.

Ontario's White-nose Syndrome Response Plan concentrates on increasing awareness about white-nose syndrome, so as to limit the inadvertent spread of the disease by humans. The MNRF is also co-operating with other ministries and governments to share information, and to co-ordinate surveillance and research.

While white-nose syndrome is by far the major threat to Ontario's bats; bats can suffer additional losses from human persecution and from wind turbines. The collapse of Ontario's bat population could lead to an increase in insect pests, just as public health authorities are calling on Ontarians to protect themselves from mosquito bites because of the spread of insect-borne diseases.

Bat populations across eastern North America are collapsing. There is no known treatment.

Update: Amphibian Declines Continue in Ontario

Amphibians are the most threatened group of vertebrate animals in the world.

Both globally and in Ontario, the most significant threat to amphibians is habitat loss. Habitat degradation (e.g., from pollutants such as agrochemicals, pharmaceuticals and road salt), habitat fragmentation, road mortality, overharvesting, invasive species, infectious diseases, climate change, and ozone depletion also put pressure on amphibian populations. In 2009, the ECO recommended that the MNRF co-ordinate an inter-ministerial plan to protect and conserve amphibian populations.

Bat White-Nose Syndrome Occurrence as of August 2016. Source: Lindsey Heffernan, Pennsylvania Game Commission.

Blanchard's cricket frog (*Acris blanchardi*). Source: Jessica Piispanen/U.S. Fish and Wildlife Service Midwest used under CC BY 2.0.

Seven years later, there has been no action, and amphibian habitat (especially wetlands) continues to decline. Provincial land-use planning policies have not effectively protected amphibian habitat. In fact, the Ontario government continues to subsidize the destruction of irreplaceable wetlands under the *Drainage Act*.

Meanwhile, the MNRF does not effectively monitor amphibian populations. Most of Ontario's information about our amphibians comes from unpaid citizen science monitoring programs. These programs are immensely valuable, but would be far more effective with MNRF leadership, co-ordination and support. Ontario cannot effectively conserve biodiversity with uncoordinated piecemeal monitoring.

ECO Recognition Award

The ECO is impressed by the passion, commitment and expertise of many government staff who devote themselves to Ontario's environmental well-being, despite obstacles and constraints.

With our annual ECO Recognition Award, we are delighted to recognize the initiative of two groups of civil servants who set outstanding examples of environmental commitment and achievement last year. This award recognizes their hard work on projects that are innovative, go above and beyond legal mandates, better Ontario's environment and that meet the requirements and purposes of the *EBR*.

The 2016 ECO Recognition Award goes to MNRF staff for the Mid-Canada Radar Site Clean-up in Polar Bear Provincial Park. An honourable mention goes to the Ministry of Transportation for its project to restore fish passage in a tributary to the Saugeen River, near Southampton, Ontario. The ECO congratulates all the ministry staff who implemented these exceptional environmental projects.

Mid-Canada Radar Site Clean-up in Polar Bear Provincial Park. Source: Ontario Parks/MNRF

Key Recommendations From This Year's Report

Volume 1

Chapter 1.2.2: No Transparency for *Aggregate Resources Act* Instruments

The Ministry of Natural Resources and Forestry should fix the long-standing deficiencies in Environmental Registry notices for *Aggregate Resources Act* instruments to ensure the public's right to be notified and comment.

Chapter 1.2.3: Outdated Proposals

All prescribed ministries should establish processes to ensure that decision notices are posted as soon as reasonably possible after decisions are made.

All prescribed ministries should remedy all of their outdated notices that remain on the Environmental Registry without a decision.

Chapter 1.2.4: Environmental Registry: Overhaul Discussions Begin

The Ministry of the Environment and Climate Change should give the needs of existing Environmental Registry users strong consideration in the design of a new Registry.

Chapter 1.4: Keeping the *EBR* in Sync with Government Changes and New Laws

The Ministry of Education should be prescribed under the *EBR* for the purposes of Applications for Review.

Chapter 2.2: Ministries' Handling of Applications for Review in 2015/2016

The Ministry of the Environment and Climate Change should conclude all overdue reviews in 2016/2017 and, further, should conduct reviews with greater speed going forward.

Chapter 2.3.2: Public Should be Alerted to Poor Water Quality After Wastewater Overflows and Bypasses

The Ministry of the Environment and Climate Change should work with Toronto Water to implement procedures for public notification of sewage bypass events as soon as possible.

Volume 2

Chapter 1: Walking the Fire Line: Managing and Using Fire in Ontario's Northern Forests

The Ministry of Natural Resources and Forestry should ensure that the fire-dependent forests it is charged with sustainably managing, including those in the Area of the Undertaking and protected areas, experience forest fire, either by letting forest fires burn or by conducting prescribed burns.

The Ministry of Natural Resources and Forestry should follow through on its commitment to build and maintain a workforce capable of executing prescribed burns, and create a team of dedicated burn personnel.

The Ontario government should ensure all communities near flammable forest become "FireSmart" by making prevention and mitigation plans mandatory, and providing adequate funding to communities to develop and implement them.

Chapter 2: Invasive Species Management in Ontario: New Act, Little Action

The Ontario government should take actions now to restrict known pathways of invasive species spread, including:
- prohibiting the sale of invasive plants;
- requiring boats to be cleaned and inspected before entering new water systems; and
- banning live bait from protected areas.

The Ministry of Natural Resources and Forestry should tackle invasive species in parks now by:
- assessing and documenting the invasive species threats to each protected area;
- developing prevention, detection and management plans; and
- allocating funds for ecological restoration that are not tied to visitor revenue.

The Ministry of Natural Resources and Forestry should establish advisory panels with scientific expertise and local and Aboriginal knowledge to propose species for regulation.

The Ontario government should report publicly on progress to manage invasive species regulated under the *Invasive Species Act, 2015*.

Chapter 3: Biodiversity Under Pressure: Wildlife Declines in Ontario

The Ministry of Natural Resources and Forestry should implement mandatory reporting for all licensed moose hunters.

The Ministry of Natural Resources and Forestry should examine and publicly report on whether habitat-related issues are playing a role in moose declines.

The Ministry of Natural Resources and Forestry should take accelerated steps to identify and implement potential recovery actions for at-risk bat species as soon as possible.

The Ministry of Natural Resources and Forestry should take steps to remedy the chronic delays in finalizing government response statements.

The Ministry of Municipal Affairs and Housing should prohibit infrastructure in provincially significant wetlands.

The Ministry of Transportation should finalize and publicly consult on its draft wildlife mitigation strategy for provincial roads.

The Ministry of Natural Resources and Forestry should develop and implement a broad-scale biodiversity monitoring program.

Conservation Ontario Council
Minutes from Meeting #3/16
Monday, September 26, 2016
Black Creek Pioneer Village

Voting Delegates Present:

Dick Hibma (Grey Sauble), Chair
Robert Morrison, Cataraqui Region
Steve Knechtel, Cataraqui Region
Kim Smale, Catfish Creek
Chris Darling, Central Lake Ontario
Don MacIver, Credit Valley
Deb Martin-Downs, Credit Valley
Tim Pidduck, Crowe Valley
Richard Wyma, Essex Region
Forrest Rowden, Essex Region
Linda Laliberte, Ganaraska Region
Helen Jowett, Grand River
Joe Farwell, Grand River
John Cottrill, Grey Sauble
John Vice, Halton
Hassaan Basit, Halton
Chris Firth-Eagland, Hamilton
Heather Stauble, Kawartha Region
Rob Messervey, Kawartha Region
Bill Mackie, Kettle Creek
Elizabeth VanHooren, Kettle Creek
Richard Simpson, Lake Simcoe Region
Mike Walters, Lake Simcoe Region
Donna Blunt, Lakehead Region
Tammy Cook, Lakehead Region
Michael Columbus, Long Point Region
Cliff Evanitski, Long Point Region
Don Pearson, Lower Thames Valley
Ray Benns, Lower Trent
Glenda Rodgers, Lower Trent
Art Versteeg, Maitland Valley
Mark Burnham, Mississippi Valley
John Karau, Mississippi Valley
Paul Lehman, Mississippi Valley
Bruce Timms, Niagara Peninsula
Stephen Kaufman, Nickel District (Conservation Sudbury)
Brian Tayler, North Bay Mattawa
Doug Lougheed, Nottawasaga Valley
Gayle Wood, Nottawasaga Valley
Dan Marinigh, Otonabee
Terry Murphy, Quinte
Frank Prevost, Raisin Region
Roger House, Raisin Region
Richard Pilon, Raisin Region
Lyle Pederson, Rideau Valley
Sommer Casgrain-Robertson, Rideau Valley
Wayne Brohman, Saugeen Valley
Rhonda Bateman, Sault Ste Marie Region
Doug Thompson, South Nation
Angela Coleman, South Nation
Steve Arnold, St. Clair Region
Brian McDougall, St. Clair Region
Brian Denney, Toronto and Region
Murray Blackie, Upper Thames River
Ian Wilcox, Upper Thames River

Members Absent:
Ausable Bayfield
Mattagami Region

Presenting Guests:
Honourable Kathryn McGarry, Minister of Natural Resources and Forestry
Jason Travers, Director, Natural Resources Conservation Policy Branch, Ministry of Natural Resources and Forestry
Steve Chapka, Policy Advisor, Minister's Office, Ministry of Natural Resources
Mark Tyler, Senior Policy Advisor, Minister's Office, Ministry of Natural Resources
Jennifer Keyes, Manager, Water Resources Section, Ministry of Natural Resources and Forestry
Finn MacDonald, Policy Research, Water Resources Section, Ministry of Natural Resources and Forestry
Mike Passey, Senior Policy Advisor, Ministry of Natural Resources and Forestry
John Dungavell, Coordinator, Ministry of Natural Resources and Forestry
Sharon Bailey, Director, Food Safety & Environmental Policy Branch, Ministry of Agriculture, Food and Rural Affairs
Paul Smith, Senior Policy Advisor, Environmental & Land Use Policy, Ministry of Agriculture, Food and Rural Affiars
Jen Turnbull, Poicy Advisor, Environmental & Land Use Policty, Ministry of Agriculture, Food and Rural Affairs

Guests:

Rob McRae, Cataraqui Region
Donna Campbell, Cataraqui Region
Keith Murch, Grand River
Lisa Burnside, Hamilton
Phil Beard, Maitland Valley
Duncan Abbott, Mississippi Valley
Carmen D'Angelo, Niagara Peninsula

CO Staff:

Kim Gavine, General Manager
Jessica Chan
Jane Dunning
Bonnie Fox
Chitra Gowda
Matt Millar
Nekeisha Mohammed
Leslie Rich
Jo-Anne Rzadki
Rick Wilson

1. Honourable Kathryn McGarry, Minister of Natural Resources and Forestry

Chair Hibma introduced the Honourable Kathryn McGarry, Minister of Natural Resources and Forestry who introduced her team and provided updates on both the Review of the Conservation Authorities Act as well as the review of the Ontario Wetlands Conservation Framework. During her remarks, the Minister announced the creation of a multi-stakeholder Service Delivery table.

Following the Minister's remarks, Jennifer Keyes (MNRF) made a presentation on the *Conservation Authorities Act Review - Stage 2 Results.* The presentation is attached to the minutes of the meeting.

2. Comments from the Chair

The following members and guests were introduced:

Donna Blunt, Chair (Lakehead Region CA)
Richard Simpson , Vice-Chair (Lake Simcoe Region CA)
Frank Prevost, Chair (Raisin Region CA)
Rob McCrae, Acting GM (Cataraqui Region CA)

The retirements of 2 General Managers were acknowledged:
Steve Knechtel (Cataraqui Region CA) and John Cottrill (Grey Sauble CA).

In addition, Forrest Rowden (Ganaraska Region CA) announced their 70th anniversary celebration will take place on October 6, 2016.

The Chair referenced the "2015-2016 CO Representatives and CA Discussion Group List" provided in Item 9-c of the Consent Agenda. The success of Conservation Ontario relies upon harnessing the expertise housed in our member CAs and the chair asked members to take the time to review the report list to recognize the significant, volunteer contributions provided through their Conservation Authority staff to collective strategic priorities over the past year. Unfortunately it is not possible for us to track all the other CA staff that have further contributed to these initiatives through review of materials and participation in related workshops.

3. Adoption of the Agenda

Doug Lougheed (NVCA) requested time to discuss a new matter as part of New Business.

#23/16 Moved by: Mark Burnham **Seconded by: Doug Thompson**

THAT the Agenda be amended by moving the following consent items to discussion items:

- ***9 g) PGMN- Partnership agreement,***
- ***9 k) Soil Health Strategy and Designation of CO Representative on Working Group***
- ***9 l) CO's Draft Submission on the Coordinated Land Use Planning Review***

AND THAT the Agenda be adopted as amended.

CARRIED

4. Declaration of Conflict of Interest

There was none.

5. Approval of the Minutes of the Previous Meeting

#24/16 Moved by: Mark Burnham **Seconded by: Rhonda Bateman**

THAT the minutes from the June 27, 2016 meeting be approved.

CARRIED

6. Business Arising from the Minutes

There was none that is not addressed in the agenda.

7. Council Business: Budget & Audit Committee Membership

#25/16 Moved by: Rhonda Batemen **Seconded by: Doug Lougheed**

THAT Council approve Tammy Cook (LRCA) and Ian Wilcox (UTRCA) as members of the Budget and Audit Committee.

CARRIED

8. Motion to move from Full Council to Committee of the Whole

#26/16 Moved by: Forrest Rowden **Seconded by: Bob Morrison**

THAT the meeting now move from Full Council to Committee of the Whole.

CARRIED

9. Consent Agenda

#27/16 Moved by: Mark Burnham Seconded by: John Cottrill

THAT Council approve a consent agenda and endorse the recommendations accompanying Items 9 a - f, 9 h – j and 9 m – q:

a. **General Managers Report**

THAT Conservation Ontario Council receives this report.

b. **Budget Status Report (August 31, 2016)**

THAT Conservation Ontario Council receives this report.

c. **April 2015-March 2016 Conservation Ontario (CO) Representatives and Conservation Authorities Program Discussion Group List**

THAT Conservation Ontario Council receives this report.

d. **Great Lakes Water Quality Agreement Executive Committee and Annex Sub-Committees Updates and Decision Items**

i. Conservation Ontario's Submission on the Great Lakes Nearshore Framework

THAT Conservation Ontario's submission dated July 12, 2016 to The Great Lakes Nearshore Framework report be endorsed

ii. Conservation Ontario Representative for Lake Erie Nutrients Working Group

THAT Jo-Anne Rzadki (Conservation Ontario) be endorsed as Conservation Ontario's representative on the Lake Erie Nutrients Working Group

iii. **Conservation Ontario Representative for Data Sharing and Management Task Team**

THAT George Sousa (Grand River Conservation Authority) be endorsed as Conservation Ontario's representative on the Data Management and Sharing Task Team

e. **Ontario Low Water Response Funding**

THAT Conservation Ontario Council endorse the letter sent to the Ministry of Natural Resources and Forestry regarding funding changes to the Ontario Low Water Response Program

f. **CO Submission on Federal Infrastructure Funding Program Design – Phase 2**

THAT Conservation Ontario endorse the comments provided to Infrastructure and Communities Canada towards the development of the Phase 2 Federal Infrastructure Plan.

h. **4R Nutrient Stewardship Memorandum of Cooperation Update**

THAT Conservation Ontario receive the following Report.

i. **Carolinian Canada Update Report**

THAT Conservation Ontario Council receives this Report

j. **The Ontario Aggregate Resources Corporation (TORAC) Board Position – CO Representative**

THAT Council endorse Chris Darling of Central Lake Ontario Conservation Authority as CO's representative on TOARC's Board

m. Road Salt Working Group Membership

THAT Amy Dickens of Quinte Region Conservation Authority be endorsed to represent Conservation Ontario on the Road Salt Working Group.

n. Conservation Ontario representatives to the Water and Erosion Control Infrastructure (WECI) Program Committee

THAT Chris Tasker (Upper Thames Region Conservation Authority) and Craig Mitchell (Toronto and Region Conservation Authority) be endorsed as Conservation Ontario representatives on the Water and Erosion Control Infrastructure (WECI) Program Committee

o. Board of Directors Meeting Minutes to be received: January 19, April 7, April 11

THAT Conservation Ontario Council receives these minutes.

p. Program Updates

i. Source Water Protection
THAT Conservation Ontario Council receives this report.

ii. Marketing & Communications
THAT Conservation Ontario Council receives this report.

iii. Business Development and Partnerships
THAT Conservation Ontario Council receives this report.

iv. Conservation Authority Members Services
THAT Conservation Ontario Council receives this report.

v. Information Management
THAT Conservation Ontario Council receives this report.

q. Project Tracking
THAT Conservation Ontario Council receives this report.

10. Discussion Items

a. 2017 Workplan

Kim Gavine (CO) highlighted the staff report provided with the agenda.

C.W. #21/16 Moved by: Doug Thompson Seconded by: Mark Burnham

THAT Council adopt the 2017 Proposed CO Workplan.

CARRIED

b. Proposed 2017 Operating Budget and CA Levy

Mark Burnham (CO Treasurer) presented the 2017 Budget. One member expressed some concern with using reserves to balance the budget. The committee will continue to look at this in future budgets.

C.W. #22/16 Moved by: Terry Murphy Seconded by: Mark Burnham

THAT Council adopt the 2017 Proposed Operating Budget as presented.

CARRIED

C.W. #23/16 Moved by: Forrest Rowden Seconded by: Helen Jowett

THAT the general levy of $1,217,000 be approved and apportioned in accordance with the attached schedule.

CARRIED

c. Conservation Authorities Act Review

Kim Gavine (CO) provided some comments and gave members an opportunity to provide feedback from the presentations made by the Honourable Kathryn McGarry, Minster of Natural Resources and Forestry and Jennifer Keyes from the Ministry of Natural Resources and Forestry.

It was recommended that we ask the Minister to "publicly endorse" the referenced multi-stakeholder Service Delivery table.

Nekeisha Mohammed's (CO) presentation *CA Act Review Social Media Campaign* is attached to the meeting minutes.

Keith Murch (GRCA) was available to answer questions on the funding chart.

It was recommended that the recommendation provided in the report be divided into 2 separate items:

C.W. #24/16 Moved by: Richard Simpson Seconded by: Mark Burnham

THAT Council endorse in principle the proposed definitions for costs and the proposed apportionment process (September 15, 2016 chart) for further discussion with the Association of Municipalities of Ontario and the Ministry of Natural Resources and Forestry.

CARRIED

C.W. #25/16 Moved by: Doug Thompson Seconded by: Brian Tayler

AND THAT Council endorse the attached joint stakeholder letter (minus the reference to the preamble and purpose statement) with a view to CO staff obtaining at the earliest opportunity the following signatories; Association of Municipalities of Ontario, Building Industry Land Development, Canadian Environmental Law Association, Ontario Homebuilders' Association, and the Ontario Federation of Agriculture.

CARRIED

d. Gilmor Case

Kim Gavine (CO) and Gayle Wood (NVCA) provided verbal updates. The Ontario Landowners Association was not successful in gaining intervener status, but a new organization has come forward requesting intervener status: Canadian Institute for Property Rights Advocacy. Their request will be heard on October 7th. Members were also reminded to submit to CO any court cases/board appeals that reference the Gilmor file.

C.W. #26/16 Moved by: Forrest Rowden Seconded by: Doug Lougheed

THAT Council receive this report as information.

CARRIED

e. Endorsement of draft *Guideline for Development of a Guide to Conservation Authority Permits on Agricultural Lands*

Bonnie Fox (CO) provided a verbal update and reported that there will be a workshop scheduled for Fall 2016 for CA Regulations and CA Stewardship staff on implementation of the Guideline.

C.W. #27/16 Moved by: Joe Farwell Seconded by: Heather Stauble

***THAT the draft Guideline for Development of a Guide to Conservation Authority Permits on Agricultural Lands* (September 2016) be endorsed;**

AND THAT the Province be so notified.

CARRIED

Items brought forward from Items for Consent:

g. Provincial Groundwater Monitoring Network – Partnership Agreement

Members acknowledged the value of the partnership and the program, but also expressed great concern with the reduced funding that accompanies the renewed agreement. In addition CA staff have reported technical and data problems that have not been addressed.

Ian Wilcox, member of the PGMN Directors Committee, suggested that the Committee could discuss and address the concerns expressed by the members.

Matt Millar (CO) reported that the PGMN Directors Committee is seeking to fill a CAO/GM position.

The staff report included the following recommendation:
THAT Conservation Ontario Council endorse the proposed amendment to the PGMN partnership agreement for signing by the Conservation Authority Provincial Groundwater Monitoring Network Partners.

C.W. #28/16 Moved by: Heather Stauble Seconded by: Rhonda Bateman

THAT Conservation Ontario Council defer the recommendation provided until the December 5, 2016 Council meeting.

CARRIED

k. Soil Health Strategy and Designation of CO Representative on Working Group

Carmen D'Angelo reported that his concerns were addressed through a discussion with Paul Smith (OMAFRA) and Jo-Anne Rzadki during lunch break. There was no additional discussion.

C.W. #29/16 Moved by: Doug Thompson Seconded by: Joe Farwell

THAT Conservation Ontario Council endorse Tracey Ryan, Manager of Environmental Education and Restoration (Grand River Conservation Authority) to continue participating on the Provincial Soil Health Working Group as CO Representative.

CARRIED

l. Conservation Ontario Draft Submission on the "Co-ordinated Land Use Planning Review"

The staff report included the following recommendation:
THAT Council endorse the draft letter, dated September 26, 2016 on the "Proposed Greenbelt Plan (2016) (EBR # 012-7169)", "Proposed Growth Plan for the Greater Golden Horseshoe, 2016 (EBR # 012-7194), "Amended Niagara Escarpment Plan, 2016 (EBR # 012-7228)" and "Proposed Oak Ridges Moraine Conservation Plan (2016) (EBR #012-7197)" for submission to the Ministry of Municipal Affairs and Housing and the Ministry of Natural Resources and Forestry.

Heather Stauble (Kawartha Conservation) expressed concerns and suggested stronger language be used for the protection of the Oak Ridges Moraine. She outlined concerns regarding the infrastructure policies within the Oak Ridges Moraine Conservation Plan as it pertained to oil and gas pipelines and the generation of electricity.

C.W. #30/16 Moved by: Heather Stauble Seconded by: Chris Darling

THAT Conservation Ontario Council endorse the Conservation Ontario Draft Submission on the "Co-ordinated Land Use Planning Review" with the following additions to recommendations on the "Oak Ridges Moraine Conservation Plan":

- ***THAT wording such as "where feasible", "where possible", "if possible" be removed and clarified and strengthened to align with the objectives of the ORMCP***
- ***THAT "energy" be removed from list of permitted uses under Section 41***
- ***THAT the requirement under Section 41 of ORMCP to "demonstrate need" and that there is "no reasonable alternative" be given legislative regard by infrastructure ministries and legislation***

CARRIED

11. Regional Presentation

Glenda Rodgers (Lower Trent) presentation on behalf of the Eastern Conservation Authorities is attached to the minutes of the meeting.

12. Presentation

Jo-Anne Rzadki (CO) introduced Sharon Bailey, Paul Smith and Jen Turnbull *Developing Ontario's Agricultural Soil Health and Conservation Strategy* is attached to the minutes of the meeting.

13. Motion to Move from Committee of the Whole to Full Council

#27/16 Moved by: Bob Morrison Seconded by: Doug Thompson

THAT the meeting now move from Committee of the Whole to Full Council.

CARRIED

14. Council Business

Council Adoption of Recommendations

#28/16 Moved by: Bruce Timms Seconded by: Heather Stauble

THAT Conservation Ontario Council adopt Committee of the Whole (C.W.) Recommendations: C.W. #21/16 to C.W. #30/16

CARRIED

15. New Business

Doug Lougheed, NVCA reported that WSIB premiums will be increasing by as much as 5.9% as a result of increases for municipal employees (that include first responders, fire fighters, etc). Every other rate group is seeing a decrease. Kim Gavine (CO) reported that this issue will be brought up at the General Manager's meeting in October.

#29/16 Moved by: Doug Lougheed Seconded by: Richard Simpson

WHEREAS all Conservation Authorities face challenges as they prepare their 2017 Budgets;

AND WHEREAS Conservation Authorities were recently advised by the Workplace Safety Insurance Board (WSIB) that their rate group (RG 8545 Local Government Services) was one of only 2 rate groups to face a rate increase (5.9%), when all other rate groups will see no increase or reduction in their premium rates;

AND WHEREAS the rationale for the 5.9% increase to rate groups including the Local Government Services rate group is due to the new Post Traumatic Stress Disorder legislation affecting First Responders (Police, Fire and Ambulance Services);

AND WHEREAS Conservation Authorities, unlike Local Government Municipalities, do not employ any First Responders as defined by the new Post Traumatic Stress Disorder legislation;

BE IT RESOLVED THAT Conservation Ontario engage the Workplace Safety Insurance Board (WSIB), on behalf of all Conservation Authorities, to consider review and reform to more accurately reflect the scope and types of work performed within a WSIB rate group to ensure the premium is relative to the work related risks of each rate group.

CARRIED

Deb Martin-Downs (CVC) reported that registration is now open for the 2016 Symposium being held November 15-17, 2016. She also reminded members of the need for items to be included in the Silent Auction at the Latornell Symposium this year. Funds raised at the auction are provided to future grant recipients who would otherwise not be able to afford to attend the conference.

16. Adjourn

#30/16 Moved by: John Cottrill Seconded by: Steve Knechtel

THAT the meeting be adjourned

Staff Report

6. (i)

To: Board of Directors
Date: August 24, 2016
From: Marlene Dorrestyn
Subject: Business Arising from September 15, 2016 meeting

- Boat ramp at Highland Glen
  - determine fees and viability of a Trillium application
  - report at upcoming meeting – *see report 7.(ii)*

- McKeough dam and upstream lands
  - requested a report regarding actions to gain control of the Phragmites – what works best – *report to be provided at the December meeting – which will include substance of Lambton County organized round table meeting regarding phragmites.*

Staff Report

7.(i)

To: Board of Directors
Date: October 24, 2016
From: Kevan Baker, Director of Lands
Subject: Conservation Lands Report

Conservation Areas:

- the Conservation Authority owns 15 conservation areas in the watershed
- of those 15 conservation areas, 6 are managed by the local municipality and 9 are operated by the Conservation Authority
- of these 9, 3 conservation areas are regional campgrounds which attract campers primarily from Southwestern Ontario
- our three regional campgrounds have over 500 campsites and 421 seasonal campers
- the three campgrounds are self-sufficient receiving no tax dollars towards the maintenance and operation; profits obtained from our campgrounds are used to offset capital improvements

Warwick Conservation Area (Warwick Township)

- the pool has been renovated with new 2 x 2 porcelain tile and colored quartz surfacing
- WIFI system has been upgraded with additional transmission units which has enhance reception and coverage
- a new laundry shed to be constructed in the woodlot campground
- the main campground washroom roof will be replaced with steel
- 25 wildlife shrubs have been planted (Bingo)

L.C. Henderson Conservation Area (Enniskillen Township)

- the campground pool fence has been replaced with new chain link fence
- 2 shower areas have been renovated with new shower surrounds and ceramic tile installed on the floors and walls
- subsurface drainage has been installed in the Towerview campground and on one of the seasonal campsites
- a new door has been installed to the outdoor education center office
- 30 wildlife shrubs have been planted (Bingo)

A.W. Campbell Conservation Area (Municipality of Brooke Alvinston)

- a 12 x 34 ft addition was constructed to existing workshop; the addition facilitates a superintendent's office, staff lunch room and storage.
- pool washrooms have been upgraded with new lighting, washroom fixtures and an accessible shower area
- bike cross trail has been upgraded with new gravel surfacing
- 30 wildlife shrubs have been planted

Other Lands Activities:

- safety railing and stairs have been installed along the trail system in the Strathroy Conservation Area (funded by Bonduelle)
- a number of cedar post supports and board walk decking has been upgraded at the Coldstream Conservation Area (Middlesex Centre)
- a new deck and accessible ramp has been constructed at the Peers Wetland CA (Sydenham Field Naturalists and Union Gas)
- 52 trees to be planted in our conservation areas (Foundation)

- many of our trails on all our properties have been widened and trimmed back to permit better access for trail users
- property boundary and no hunting signs have been posted on Foundation and managed forest properties.

<u>Camping Statistics:</u>

- 421 seasonal campers have registered in our 3 campgrounds, down from 422 in 2015. 190 seasonal campers are registered at Warwick (191 in 2015), 123 at LC Henderson (123 in 2015) and 108 at A.W. Campbell (108 in 2015).
- our 3 regional campgrounds have been busy this year, gross revenues to the end of September are $ 1,128,000 (up 3 %), and net revenues remained even (seasonal camping up 2 % to $792,000; overnight camping up 6% to $213,000; and pump-out up 10% to $37,000.00)

Foundation Lands:

- the St. Clair Region Conservation Foundation owns 16 land holdings and 456 hectares of land; these lands are maintained and operated by the Conservation Authority

- new property identification signs have been installed at the Gawne Habitat Management Area (Dawn-Euphemia) and Evoy Woods (Enniskillen)
- a number of dead ash trees to be removed from around the perimeter of the property at the Maples Woodlot (Plympton-Wyoming)
- at the Evoy property; a new property identification sign has been installed and forestry staff are preparing a forest management plan which will enable the property to be eligible for the Managed Forest Tax Incentive Plan (MFTIP) (waiting for MPAC to provide a roll number)
- at the Keith McLean Conservation Lands; extensive tree trimming has taken place along the access laneway off Rose Beach Line and around one of the agricultural fields

- the Foundation has provided financial assistance to the Conservation Authority to support the development and maintenance of trails on our properties

County of Lambton Lands:

- fencing has been upgraded on the sand hill in Port Franks; the fence restricts access and allows for dune grasses to become established (Lambton County Heritage Forest)
- trail head signage has been installed at the Lambton County Heritage Forest
- a new property identification sign has been installed at the Bowens Creek Management Area
- forestry staff continue to manage the over 40,000 trees at the Bowens Creek Management Area

McKeough Upstream Lands:

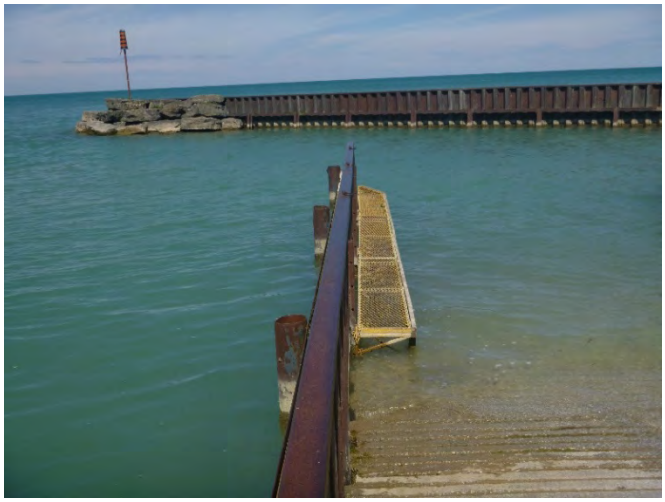
- wetlands on properties 38 and 79 have been upgraded to improve water retention and reduce soil erosion
- a climate change tree growth plot has been planted at property 105; this plot consists of 600 red and swamp white oak seedlings and the study will compare the growth and survival rates of locally supplied and southern U.S. trees (Forestry Department)
- approximately 8000 ft of 4 inch and 1600 ft of 6-inch tile drainage has been installed at Property 82

Staff Report

7.(ii)

To: Board of Directors
Date: October 25, 2016
From: Kevan Baker, Director of Lands
Subject: Highland Glen Boat Ramp and Seawall Project

Highland Glen Conservation Area:



General Information:

- the Highland Glen Conservation Area is located on Lakeshore Road in the Town of Plympton-Wyoming
- it has an access roadway, two parking lots, pavilion, beach access, picnic tables, and a boat ramp onto Lake Huron
- during the spring fishing season and on nice days in the summer the area is extremely busy with boat and vehicle traffic
- the access to the conservation area and boat ramp have been free and the operation and maintenance costs are covered by general levy.
- proposed fees for 2017 will assist with maintenance and upkeep costs.
- to our knowledge the Highland Glen boat ramp is the only ramp accessing Lake Huron between Sarnia and Port Franks

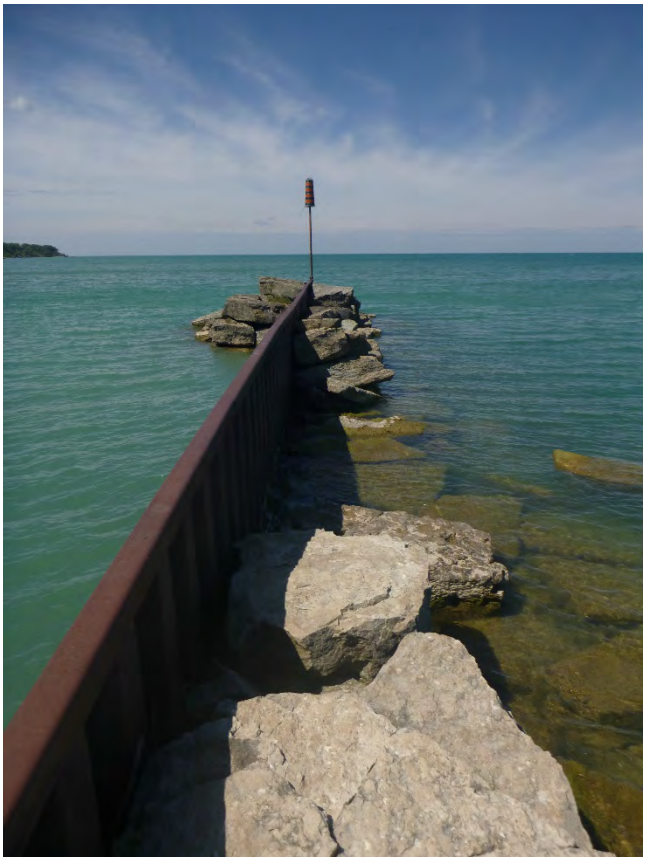
Boat Ramp and Seawall protection:

- the boat ramp and seawall were constructed in 2 phases; the access roadway and ramp constructed in 1986 and the seawall protection in 1990
- total cost for the entire project was approximately $ 200,000.00 with funds coming from all levels of government
- other than a few repairs over the last 25 to 30 years the facility has held up well to weather, time and public use
- however, there are maintenance and upgrades required to meet public needs and ensure the facility is safe and usable long term

Proposed Upgrades:

- replace and install approximately 60 ft of new docking walkways along both sides of the boat ramp, this will allow for more than one boat to be docked at a time
- repair existing seawall by excavation and installing new tie back supports
- remove existing non-operational dock supports from within the harbor area
- reposition existing armor stone to provide the necessary support for the steel seawall

Estimated Cost $40,000.00



2017 Boat Ramp Fee Comparisons
KB/October 12, 2015

7.(ii)

Boat Ramp Location	Per Ramp Fee	Seasonal Rate
Sarnia Bay Marina (City of Sarnia) (2016 rate)	$ 12.00	$150.00
Port Franks Marina (Lambton Shores)(2016 rates)	$15.50	$ 234.00
Grand Bend Marina (Lambton Shores)(2016 rates)	$ 15.50	$234.00
Kettle Point Marina (Kettle Point First Nations) (2016 rates)	$ 15.00	Unknown
Highland Glen Conservation Area (St. Clair Region Conservation Authority) (Proposed for 2017)	$ 10.00	$ 120.00

Staff Report 8.(i)

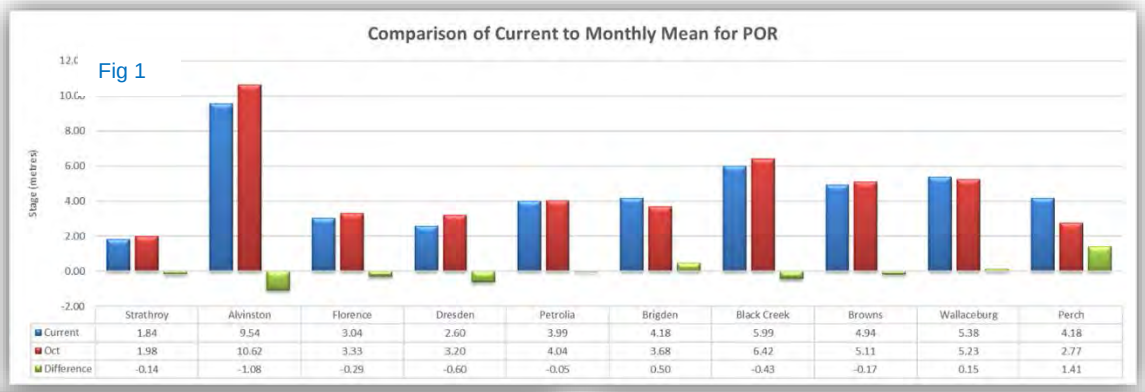
To: SCRCA Board of Directors
Date: October 27, 2016
From: Steve Clark, Water Res. Spec.
Subject: Current Watershed and Lake Conditions

<u>Watershed Precipitation and Streamflow Conditions</u>

Highlights:
- Lower precipitation and levels into fall
- Average watershed flow conditions

- Precipitation and flow conditions continued to be lower than normal in September with most of the regional stations reporting only 60%-70% of the expected rain. The major exception was the Windsor region which experienced a significant rainfall over a period of several days resulting in significant local flood conditions. This localized storm did not however affect our region directly and the final three-month precipitation was recorded at below the average at 94% of normal.
- Several storm events into October improved precipitation conditions slightly into October with several periods of continuous precipitation associated mosltly with frontal weather systems which are more common in the fall period. This maintained watershed flows close

Fig 1



	Strathroy	Alvinston	Florence	Dresden	Petrolia	Brigden	Black Creek	Browns	Wallaceburg	Perch
Current	1.84	9.54	3.04	2.60	3.99	4.18	5.99	4.94	5.38	4.18
Oct	1.98	10.62	3.33	3.20	4.04	3.68	6.42	5.11	5.23	2.77
Difference	-0.14	-1.08	-0.29	-0.60	-0.05	0.50	-0.43	-0.17	0.15	1.41

Fig 2

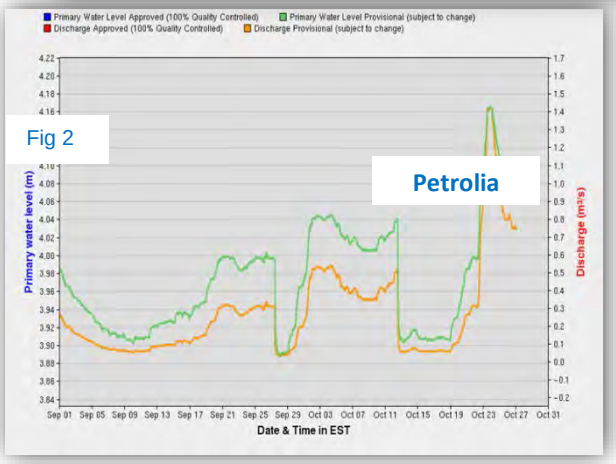
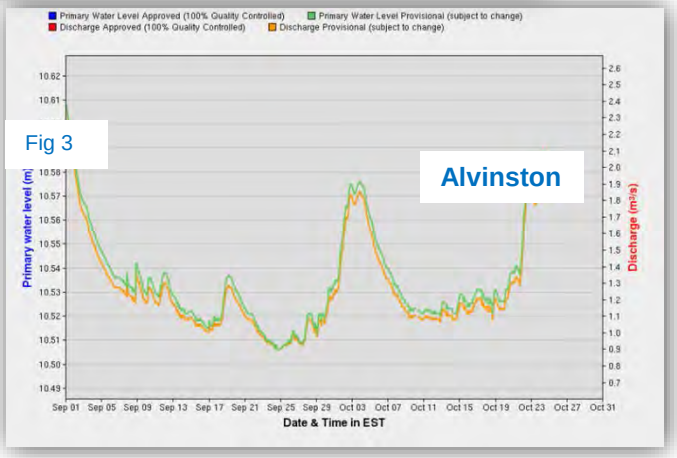
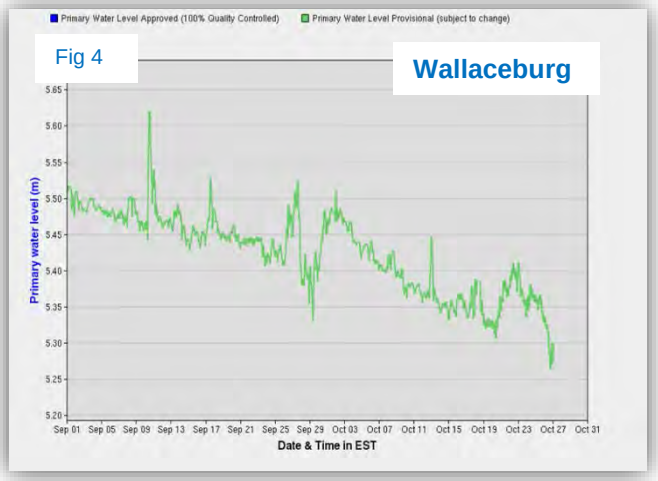


Fig 3



to average as in fig 1. with levels being a little above average at some stations.

Fig 4



➢Flows recorded at key stations in the watershed identify the sudden response to rain events which returned to normal quickly (figs 2 and 3). Additionally, flows at Wallaceburg, while not as quick to respond, have continued however to gradually decline over the last two months by approximately 30cm. As we move into the winter flows will likely continue to be at or slightly below average as the amount of runoff is reduced with the colder conditions and greater storage in the form of snowfall.

Monthly % Normal	Sarnia	Strathroy	London	Windsor
September 2016	62%	64%	72%	173%
October 2016	103%	67%	59%	104%

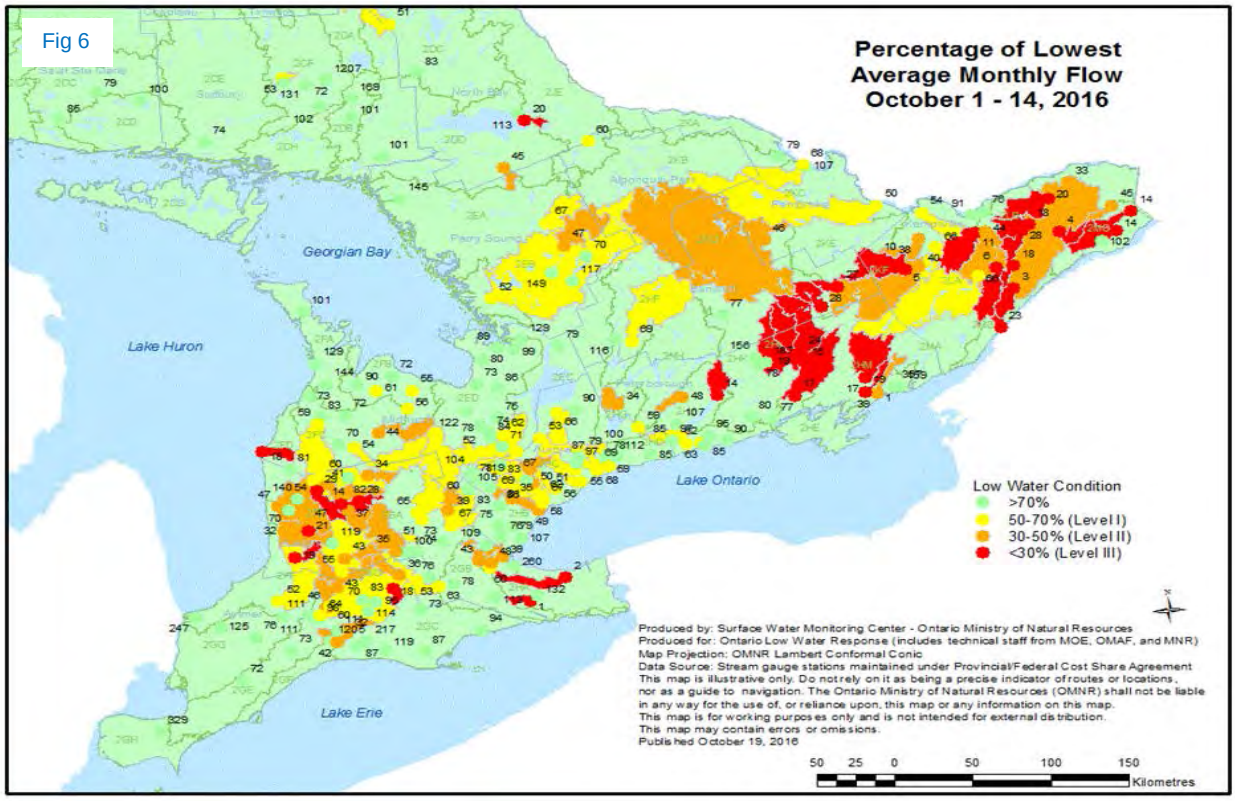
- As noted, precipitation remained lower in September and higher in the upper areas of the watershed. Central areas continued the trend of **40%** less than average precipitation.
- Regionally the three and six month trend continues be below average by **6%** and **13%** respectively which in turn has now begun impacted on the past 12 month numbers. While these numbers indicate reduced amount of precipitation, this trend has not been as significant as other areas of the province to the east where Level II and in some cases level III conditions have been persistent over the course of the summer and into the fall.

Fig 5

Precipitation (mm)	Sarnia		Strathroy		London		Windsor	
Last Quarter	Actual	Normal	Actual	Normal	Actual	Normal	Actual	Normal
October	68	66	47.2	70.8	45.5	77.6	67.4	64.9
September	58.1	94	57.8	89.8	70.3	97.7	166.6	96.2
August	65.8	77.1	91.2	82.1	107	85.3	75.8	79.7
Averages								
last 3 month totals	191.9	237.1	196.2	242.7	222.8	260.6	309.8	240.8
last 3 month % of normal	80.9%		80.8%		85.5%		128.7%	
regional average	94.0%							
last 6 month totals	393.6	466.6	410.6	462.9	408.1	512.5	477.4	493.2
last 6 month % of normal	84.4%		88.7%		79.6%		96.8%	
regional average	87.4%							
last 12 month totals	787	846.8	842.6	945.1	858	987	933.7	918.4
last 12 month % of normal	92.9%		89.2%		86.9%		101.7%	
regional average	92.7%							

MNRF data is compared with the last significant drought period in 2012 and although it has been a somewhat dry summer for our watershed this year, the MNRF standard for drought conditions was not met as it was for our watershed in 2012. Fig 6 below identifies those

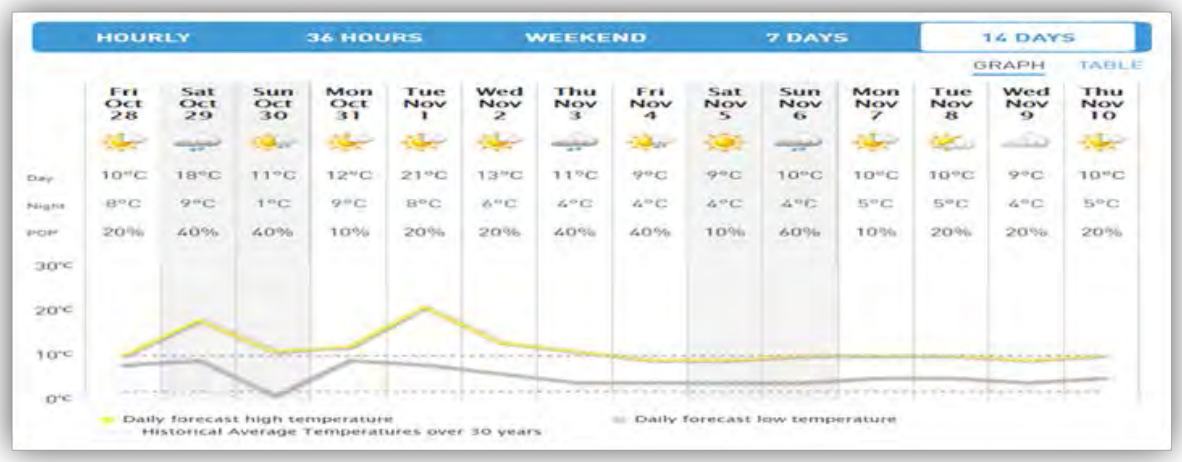
watersheds throughout the province that continue to experience low flow conditions as compared to the precipitation and flow conditions thresholds for August.



Flood Threat

Based on current conditions there is no concern for any flood conditions as the watershed is able to handle most storm events. While seasonal flows remain in the average range, we continue to monitor changes in watershed conditions as they occur. As always we will continue monitor flows and any significant storm events. Advisories will be provided as conditions dictate.

Weather Forecast (Data: Weather Network, Environment Canada, OFA)

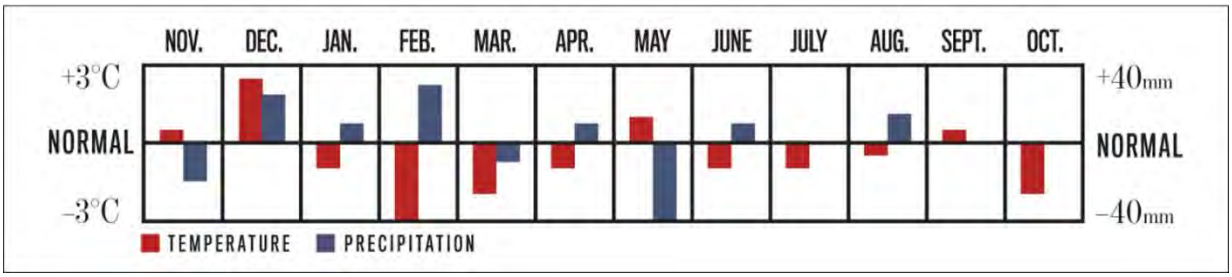


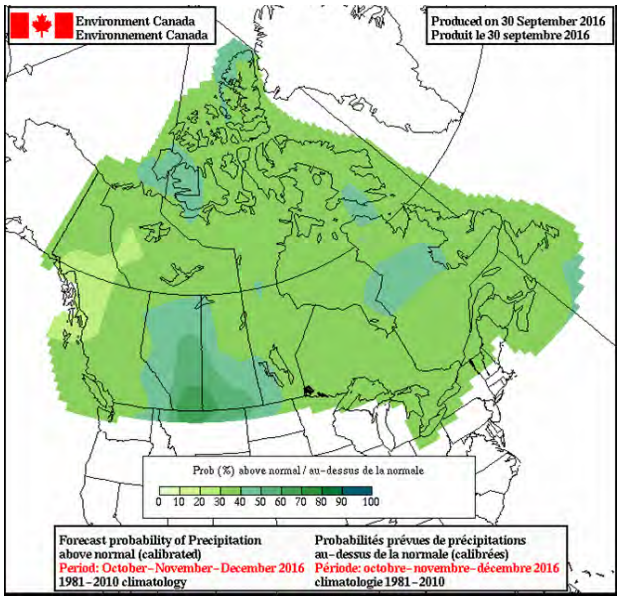
Short Term Outlook

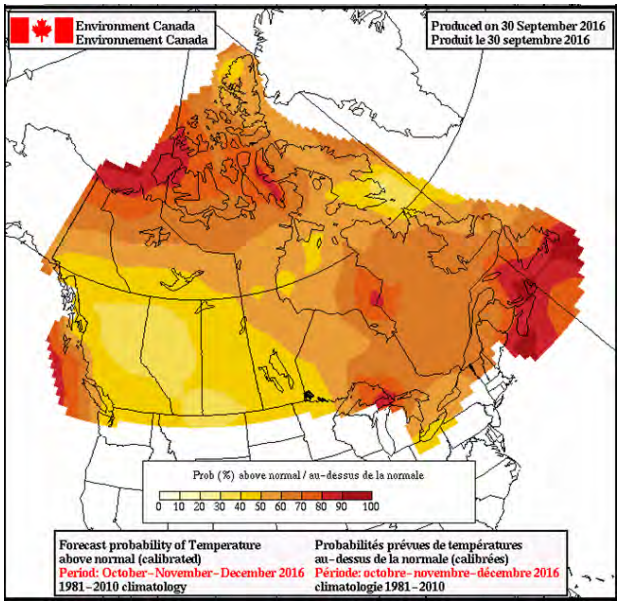
- Seasonal temperature and precipitation across the region over the next 14 days

Long Term Outlook

- Environment Winter will be warmer than normal in the remainder of 2016, with above-normal precipitation and snowfall. Temperatures will be colder with higher precipitation into 2017 with the potential for significant lake-effect snow conditions. The coldest periods will be in early to mid-January, late January, and late February, with the snowiest periods in mid- and late December, early January, and mid-February.







Great Lakes Levels (Canadian Hydrometric, NOAA data – September)

Units	Current Monthly Level	Monthly Level Last Year	Change 2015/2016	Current Month Avg for Last 10 Years	Change Current compared to 10 year	Anticipated Next Month	Average for Period of Record (96 years)
Lake St. Clair							
Metric (m)	175.41	175.42	-0.01	175.03	0.38	175.28	175.08
Imperial (ft)	575.49	575.52	-0.03	574.24	1.25	575.06	574.41
Lake Huron							
Metric (m)	176.78	176.7	0.08	176.19	0.59	176.70	176.50
Imperial (ft)	579.99	579.72	0.26	578.05	1.94	579.72	579.07

The monthly comparison for September 2016 (current available data) indicate that Lake Huron levels have increased only slightly by 8 **cm** over September 2015 and continue to remain above the 10 year average for Lake Huron at **59cm.** Lake St. Clair levels are almost identical to last year and **38cm** above the 10 year average. Both lakes also remain above the average for the entire period of record by approximately 30 cm.

Ipperwash October 2015

Ipperwash October 2016

Staff Report

8.(ii)

To: Board of Directors
Date: October 27, 2016
From: Girish Sankar, Director of Water Resources
Subject: Water & Erosion Control Infrastructure (WECI) Projects

- we continue to wrap up projects on a monthly basis. Status of **2016 WECI/Shoreline** projects is outlined below:

Structure	Project Name	Status
McKeough Dam	Dam Safety Review	Golder Associates have been retained to complete the DSR
McKeough Dam	McKeough Dam Drop structure repair	Completed by Brosco Concrete restoration as of September 2016
Petrolia Dam	Stop log replacement	Completed as of July 2016
Courtright Park	Courtright shoreline revitalization	Design work ongoing
Aamjiwnaang Shoreline	Aamjiwnaang shoreline naturalization	Design work ongoing, Construction work expected to start early 2017

McKeough Dam drainage improvement works

- previous inspections of the Floodway channel sideslope showed indications of slope failure
- in some cases, sideslopes had slid down the slope opening up crevices along the top of the side slope parallel to the channel
- this was attributed to the concentration of surface runoff at a few low areas on the top of the berms
- McKeough staff have installed a tile along the top berm to drain water effectively to minimize the low spots.
- 2 sections of approximately 900 foot of 4-inch tiling was completed, these tiles outlet to the bottom of the channel

Staff Report

9.(i)

To: Board of Directors
Date: November 1, 2016
From: Jessica Van Zwol, Healthy Watershed Specialist
Subject: Healthy Watersheds Program - Outreach

Recent Event Highlights

Ipperwash Beach Great Canadian Shoreline Cleanup *September 10*

More than 10 community volunteers met at the Centre Ipperwash Boat Launch and spread out from there to clean the beach. We even had visitors from Michigan volunteer! Over 50 pounds of garbage were collected.

Ag in the Classroom *September 16*

As part of our growing relationship with the agriculture community in Lambton Shores, staff was asked to provide a soil health and water quality demonstration to 120 grades 3 & 4 students from Forest. Using chocolate sprinkles for livestock “poop” and food colouring for fertilizers and herbicides were quite a hit with the students!

Mount Brydges TD Tree Days *September 17*
Despite the rain, over 60 Scouts and volunteers came out to plant 150 native trees in 3 parks in Mount Brydges.

Forest Fall Fair *September 23-25*
Staff had a booth at the Forest Fall Fair and spoke with many individuals and families about what SCRCA does, including biological monitoring and agricultural and stewardship grants.

Sarnia TD Tree Days *October 22*
We had close to 50 volunteers participate in this sunny but chilly Saturday morning tree planting event at Canatara Park in Sarnia. A large portion of the volunteers were international students from Lambton College. They had a great time; if it weren't for them, it would have taken a long time to plant all 300 trees. Some of Shell's Environment employees participated and are keen to partner with SCRCA to create a similar event!

Stewardship projects – **Grants available** SCRCA secures funding to support landowner implemented stewardship projects including riparian buffers, block tree planting, windbreaks, wetlands, and erosion control measures. Staff meet with landowners, offer advice and project design and where applicable, support projects with grants. Call today for more information for stewardship projects.

Upcoming Events:
Lambton Soil and Crop Improvement Association Winter meeting *November 3***:**
Staff will have a booth to talk with farmers about stewardship projects, soil health, and water quality (GLASI)

Staff Report *9.(ii)*

To: Board of Directors
Date: October 25th, 2016
From: Nicole Drumm, Aquatic Research Technician
Subject: Fish Community Surveys

Fish Community Surveys

With support from the Department of Fisheries and Oceans (DFO) and a three-year partnership with the Friends of the St. Clair River funded by the Ontario Trillium Foundation (OTF), the SCRCA biology staff have been able to complete fish community surveys throughout our watershed. Survey work for OTF focused on the St. Clair River Area of Concern (AOC) while DFO work took place throughout the St. Clair Region.

The purpose of fish community surveys is to gain important information on fish species distribution and watershed health. Additionally, the data will provide information for management recommendations.

The fish data collected will be compiled and shared with other entities including DFO, the Royal Ontario Museum, and the Flowing Waters Information System (FWIS), so that the information can be used to instruct policies and studies. Our data will contribute to important fish records that began in the early 1900s.

For the 2016 fish surveys:

- 16 sites were sampled
- thousands of fish were examined (identified, weighed, measured and recorded)
- invasive species that threaten our native fish were found at multiple sites including carp, goldfish and goby
- approximately 40 different fish species were identified in these locations combined; there are approximately 160 native freshwater fish species in Ontario with the Sydenham being home to at least 82 of these species

Black crappie in viewing boxes

Longnose gar

Staff Report *9.(iii)*

To: Board of Directors
Date: October 25, 2016
From: Nicole Drumm, Aquatic Research Technician
Subject: Biology Education Programs

The SCRCA biology department participated in several public outreach and educational events this year and, through these programs, were able to reach thousands of people spanning various demographics.

Turtle Watch/Adopt-a-Pond
The SCRCA, in conjunction with Middlesex Public Library, held a community information event called Turtle Watch. The information presented was created by the Toronto Zoo's Adopt-a-Pond program with a focus on locally significant turtles as well as other local reptiles and amphibians. Topics covered by the presentation included the identification of all turtle species native to Ontario, how to help turtles safely cross roadways, and citizen science programs that families can participate in. The audience of the presentation was mainly local families with young children. Following the presentation, all those in attendance were invited to congregate at a nearby stream where a SCRCA staff member had collected and discussed interesting aquatic life and was available to answer specific questions on turtle habitat and life cycles.

Strathroy District Collegiate Institute Earth Week Presentations
Strathroy District Collegiate Institute (SDCI) asked the SCRCA to give a presentation on Species at Risk and Invasive Species to all six of their grade 9 level Canadian Geography classes. The presentations covered all species at risk located within the watershed with an emphasis on mussels and reptiles. Talking points included unique attributes of certain species as well as some of the factors that cause species to become at risk. Hands-on material was also brought in for the post-presentation question and answer session where a lot of interest was directed at species at risk reptiles, particularly turtles. Overall, around 200 students were reached during the two days over which the presentations were given.

Aamjiwnaang First Nation Earth Day
At the request of the Aamjiwnaang First Nation the SCRCA attended their annual Earth Day celebrations. A biology staff member was on hand with information about species at risk in the region, including snakes and turtles. The theme for this year's celebration was turtles and, as such, many of the questions raised at the SCRCA booth revolved around local at risk turtles.

Kettle and Stony Point First Nation School Education Program

Over two days in October, grade 3-5 students from the Hillside School at Kettle and Stony Point First Nation were educated on aquatic insects, fish, reptiles, species at risk, and their environmental significance. On the first day, the classes spent time with our biologists in Shashawandah Creek where they were able to capture aquatic insects and check minnow traps. The second visit consisted of an in-class portion where SCRCA staff presented material on habitat loss, reptilian species at risk, and played an educational game outside with the children that reinforced the concepts learned earlier in the day. The students were then read a story book on the locally endangered Five-lined Skink and took part in a craft where they used clay to make a skink of their own.

Students in Shashawandah Creek

Children using nets to catch aquatic insects

Chatham-Kent & Lambton Children's Water Festival

The 8th Annual Chatham-Kent & Lambton Children's Water Festival was coordinated by the Lower Thames Valley Conservation Authority and was held at the CM Wilson Conservation Area. This three day festival took place from October 4-6 and had a record attendance of nearly 2,000 students. The students were able to visit more than 40 educational and interactive stations to learn about various topics relating to water. On the first day, the biology staff member in attendance delivered a program on the importance of groundwater protection and for the remaining two days ran a station that addressed the importance of the native flora and fauna, with a focus on the aquatic insects, that live in our watercourses. The kids had a chance to use nets to catch and study the insects, tadpoles and fish living in the nearby pond. By working with the LTVCA, we were able to engage children in the community, foster respect for our water resources, and encourage environmental stewardship and sustainability.

Aquatic Education Day with an Elementary School in the St. Clair AOC
160 students ranging from kindergarten to grade 8 attended our educational river day in the St. Clair Area of Concern (AOC). SCRCA educators along with members of the biology department ran different stations that provided the children with the opportunity to learn about various topics relating to the water cycle, wetlands, lakes and rivers. Biology staff demonstrated how fish surveys are performed and taught the children about the fish and other animals that live in our watercourses. The river day was implemented by the SCRCA with funds received from an Ontario Trillium Foundation grant secured through a partnership with the Friends of St. Clair River.

Fish survey demonstration using seine nets

Teaching children about fish found in our rivers

Park Street Place Presentation
The Park Street Place Retirement Residence asked the SCRCA to visit and deliver a presentation to the residents. A biology staff member gave a presentation, which was followed by a discussion, on species at risk (SAR) in Ontario including mussels, fish, reptiles and projects the biology department has taken on to support the recovery of our local SAR populations.

Workshop with High School Students Enrolled in an Agriculture Specialist High Skills Major (SHSM)
Over the course of two days, biology department staff assisted in a workshop with local high school students pursuing a Specialist High Skills Major (SHSM) in agriculture. The topics covered included best management practices, conservation agriculture, nutrient management, and the principles of drains.

Staff Report *9.(iv)*

To: Board of Directors
Date: October 26, 2016
From: Erin Carroll, Manager of Biology
Subject: Watershed Report Cards

Background

- all Conservation Authorities agreed to produce Watershed Report Cards on a regular basis to:
  - respond to public demand for easily understood environmental information
  - allow Conservation Authorities to demonstrate accountability
  - allow comparison of environmental parameters between abutting watersheds

- SCRCA Report Card includes a Summary Report on Forest Conditions and Surface Water Quality

- in addition, the St. Clair region was divided into 14 subwatersheds, and 14 individual Report Cards written

- forest conditions are graded on the amount of Forest Cover and Forest Interior

- surface water quality grades are based on Total Phosphorus, E. coli and Benthic invertebrate values where this information is available

- cards include assessments and grades for Forest Conditions and Surface Water Quality and analysis or written descriptions of: land use; geology; soils; streamside cover; wetlands; groundwater; natural areas; fishes; species at risk; area; municipalities; First Nations; watercourses and waste water treatment plants

Current Status

- the planned release of the next round of watershed report cards is 2018.

- the St. Clair Region Conservation Foundation donated $10,000 in 2017 towards to production of the next round.

- it is anticipated that a contract position under the Job Creation Program will be hired in December with the contract extending until the end of March. This person will work on delineating the woodland boundaries, using updated aerial photography.

Staff Report 10.(i)

To: Board of Directors
Date: November 1, 2016
From: Steve Shaw, Conservation Services Department
Subject: Conservation Services Report

Tree Planting Program

- staff are busy preparing for the 2017 spring tree planting program
- interested landowners are being called and site visit appointments are well underway
- all projects that meet the program criteria are planned for project review on November 22nd for funding approval under one or more of the grant programs that SCRCA has available for financial incentive.
- 2017 tree allocations and prices from the supplying nurseries are expected to be finalized before the end of the month.
- more than $120,000 in grants have been secured through several individual tree planting and habitat improvement programs and will be used to offset landowner project expenses.
- approximately 40,000 trees are expected to be subsidized though the SCRCA in 2017.
- Forests Ontario provided SCRCA approximately $70,000 in grant this year which was used to offset some of the costs of tree planting expenses on private lands and some of the costs associated with the Assisted Migration Tree plot at Warwick CA.

Seed Collection Program

- this year's tree seed collection was very successful with approximately 600 litres of oak and hickory seed collected and another 2500 litres of walnut seed collected and shipped to our supplying tree nursery.
- deciduous trees are a major component of the SCRCA planting program and future seedling stock from the tree nursery is directly related to the tree seed collected and shipped annually.
- all tree seed collected by SCRCA staff is local seed. Since demand for deciduous trees is higher than what is available from tree nurseries, first choice for next year's deciduous trees is normally given to the agency that collected that particular tree seed. This also ensures that trees planted by SCRCA in the future will be from genetically local tree stock.

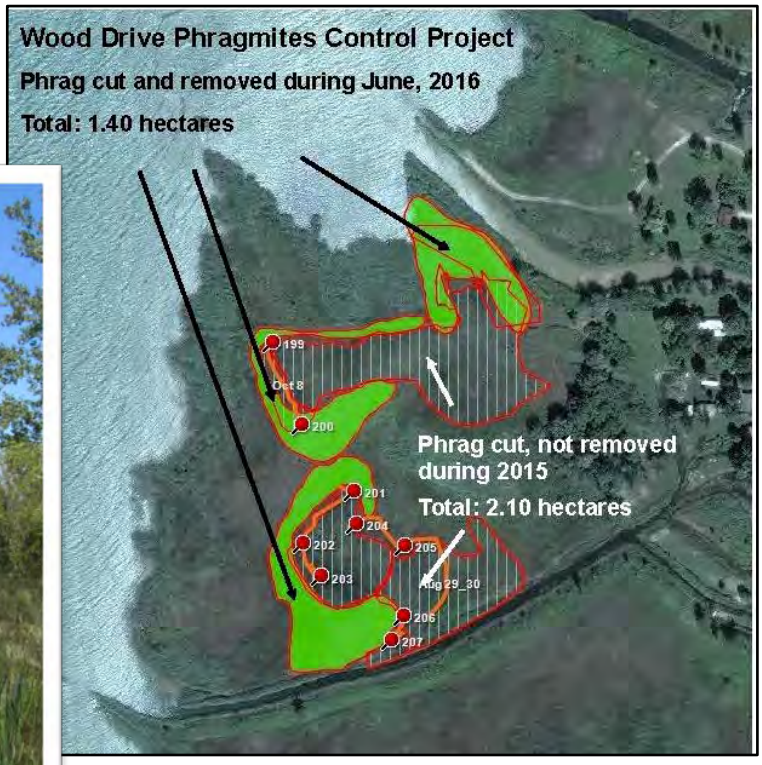
Vegetation Management Program

- approximately 200,000 trees require follow up with herbicide this fall
- fall herbicide application for vegetation control on 2013 to 2016 tree planting sites started in late October and will end after the first killing frost.
- warmer fall weather over the past several years has delayed the program due to deciduous trees holding on to their leaves longer than normal
- approximately 8 km of municipal brush control was completed this summer for the municipality of Southwest Middlesex. Regrowth of woody brush from the previous year's drain clean out is treated with a herbicide to prevent re-establishment.

Stewardship funding

- we were awarded a one year grant under the Ministry of Natural Resources and Forestry's Species at Risk Stewardship program for 2016-2017
- a new stewardship application was required for 2017-2018, so we decided to combine this year's application with the Reptiles SAR application which was also due this year. The biology department worked on the application process and combined both SAR projects into one very big application. It was recently submitted for review
- another year of funding from Great Lakes Guardian Community Fund resulted in many hours of laborious work in Lambton Shores this year. A final report will be submitted to OMAFRA in the new year.
- the Lambton Shores Phragmites Community Group has secured 3 years of funding under other programs. SCRCA will continue to work with them and support their efforts.

Dense, flooded Phragmites section after cutting and drowning operations



ST. CLAIR REGION CONSERVATION AUTHORITY REGULATIONS ACTIVITY REPORT **11.(i)**

October 31, 2016

TO: **SCRCA Chair and Board of Directors**

SUBJECT: **Administration – Section 28 Status Report – Development, Interference of Wetlands and Alteration to Shorelines Watercourses Regulation**

FROM: Dallas Cundick, Environmental Planner / Regulations Officer
Melissa Deisley, Regulations Officer

A summary of staff activity related to the Conservation Authority's *Development, Interference of Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 171/06 under Ontario Regulation 97/04) is presented below. This report covers the period from September 1, 2016 to October 31, 2016.

September 1, 2016 to September 30, 2016

Application No.	Applicant and Subject Property	Proposed Works ***Permissions may be granted where in the opinion of the CA, the control of Flooding, Erosion, Dynamic Beach, Pollution, or the Conservation of Land will not be affected by the development.***	Submission Complete: Permit Issued:
11184	**Eugene Marchand** 29915 St. Clair Parkway Municipality of Chatham-Kent	• Construct an addition; • Plans completed by Dave Polowick Design;	04/08/2016 01/09/2016
11185	**Plains Midstream Canada** Lot 17, Con 4 GORE Municipality of Chatham-Kent	• Integrity Dig; • Plans prepared by Stantec Consulting Ltd.;	22/08/2016 01/09/2016
11187	**Pat Misson** 4338 St. Clair Parkway Township of St. Clair	• Construct a deck addition; • Works are appropriately floodproofed;	29/08/2016 08/09/2016
11188	**Clarence & Tina Dykhouse** 4156 St. Clair Parkway Township of St. Clair	• Construct a new garage; • Plans completed by Lambton Design Consultants;	06/09/2016 08/09/2016
11189	**Union Gas Limited**	• Install of 8852m NPS Pipeline;	13/09/2016

	Quaker Drive Township of Warwick	• Plans completed by Union Gas Limited;	13/09/2016
11190	**Terry & Barbara Jones** Coldstream Road Township of Middlesex Centre	• Construction of Access Laneway; • Plans Completed by Spriet Associates Ltd.;	02/09/2016 09/09/2016
11191	**Mun. of Middlesex Centre** 10227 Ilderton Road Mun. of Middlesex Centre	• Construction of Access Laneway and Parking Lot; • Plans completed by Middlesex Centre;	21/09/2016 21/09/2016
11192	**Devy Brouwer** Old Lakeshore Road City of Sarnia	• Construct a New Dwelling; • Plans completed by David Lavender Architect;	16/08/2016 14/09/2016
11193	**County of Lambton** Petrolia Line Geo. Twp. Enniskillen	• Rehabilitation of Bridge; • Plans completed by B.M. Ross and Associates Ltd.;	07/09/2016 16/09/2016
11194	**Wendy Milliken** 6914 Petrolia Line Township of Brooke-Alvinston	• Construct an Addition; • Plans completed by Evan Lucas Designs;	16/08/2016 12/09/2016
11195	**Dominic DiCarlo** 6214 Telfer Road City of Sarnia	• Construct a New Dwelling; • Plans completed by Lambton Design Consultants;	23/09/2016 23/09/2016
11196	**Brad Nelson** 5418 Oak Ave Mun. of Lambton Shores	• Construct a Covered Patio; • Plans completed by Aaron Lucas Design;	09/09/2016 27/09/2016

October 1, 2016 to October 31, 2016

Application No.	**Applicant and Subject Property**	**Proposed Works** ***Permissions may be granted where in the opinion of the CA, the control of Flooding, Erosion, Dynamic Beach, Pollution, or the Conservation of Land will not be affected by the development.***	**Submission Complete:** **Permit Issued:**
10938 Amended-III	**Bill and Joanne Marshall** 4690 Lakeshore Street Town of Plympton-Wyoming	• Construction of a New Addition; • Plans prepared by Brandon Home Designs;	13/10/2016 17/10/2016
11198	**Middlesex Centre**	• Culvert Replacement;	27/09/2016

	Ivan Drive Mun. of Middlesex Centre	• Plans completed by Middlesex Centre;	03/10/2016
11199	**Town of Plympton-Wyoming** 8046 Hillsboro Road Town of Plympton-Wyoming	• Re-Construction of a Bridge Embankments; • Plans completed by Northwest Consulting;	22/09/2016 13/10/2016
11200	**Roger Buurma** Murphy Drive Twp. Of Adelaide-Metcalfe	• Erosion Repair/Creek Rehabilitation; • Detailed plans completed by Roger Buurma;	17/10/2016 19/10/2016
11201	**Town of Plympton-Wyoming** Confederation Line Town of Plympton-Wyoming	• Culvert Replacement; • Plans completed by R. Dobbin Engineering Inc.;	17/10/2016 18/10/2016
11202	**John & Heidi McIntyre** 3913 Pointview Drive Town of Plympton-Wyoming	• Construction of a Covered Porch; • Plans completed by Aaron Lucas Design; • Proposed works meet SCRCA Shoreline Policy;	22/09/2016 18/10/2016
11206	**Earl Spohn** 4544 William Street Town of Plympton-Wyoming	• Construct a Front Deck Entrance; • Proposed works meet SCRCA Shoreline Policy;	26/10/2016 28/10/2016

Total No. of Application = 19 **Average No. of Days for SCRCA to Issue Permit = 11 Days**

Permit Review Timelines are outlined in the document "*Policies and Procedures for Conservation Authority Plan Review and Permitting Activities*" Final Version May 2010, completed by the Conservation Authority Liaison Committee (CALC). In this document it states;

- CAs are to make a decision (i.e. recommendation to approve or referred to a Hearing) with respect to a permission (permit) application and pursuant to the CA Act within 30 days for a minor application and 90 days for a major application.

Recommended and Approved by:

_____ _____

Dallas Cundick, Environmental Planner/Regulations Officer Melissa Deisley, Regulations Officer

_____

Patty Hayman, Director of Planning

ST. CLAIR REGION CONSERVATION AUTHORITY REGULATIONS ACTIVITY REPORT- VIOLATIONS AND CORRECTIVE ACTIONS

October 31, 2015

TO: **SCRCA Chair and Board of Directors**

SUBJECT: **Enforcement- Section 28 Status Report – Development, Interference of Wetlands and Alterations to Shorelines and Watercourses Regulation**

FROM: Dallas Cundick, Environmental Planner/Regulations Officer

File	Background
FV # 201604 **Devonshire Road** Town of Plympton-Wyoming County of Lambton	• Unauthorized New Groyne Construction; • On Crown Land, MNRF requiring permit under *Public Lands Act*; • SCRCA to send requirements for application for works undertaken;
FV # 201610 **Bluepoint Drive** Town of Plympton-Wyoming County of Lambton	• Unauthorized Shoreline Protection Works along Bluepoint Subdivision; • Works are in front of several properties and appear to be on an area of user common to all owners of subdivision; • SCRCA is investigating further;

Recommended and approved by:

_____
Dallas Cundick, Environmental Planner/Regulations Officer

_____
Melissa Deisley, Regulations Officer

_____
Patty Hayman, Director of Planning

Staff Report *11.(ii)*

To: Board of Directors
Date: October 31, 2016
From: Patty Hayman, Director of Planning
Dallas Cundick, EP/Regulations Officer
Subject: SCRCA Coastal review of Development applications

Lake Huron is experiencing high lake levels and erosion of the shoreline whereas in the last twenty years minimal erosion has occurred due to low lake levels. There are numerous Regulation violations as a result of "knee jerk" installations of (non engineered) sheet steel walls and groynes which can have a significant impact updrift and downdrift of the structure. The St. Clair Region Conservation Authority shoreline is heavily protected with structures that are aging and failing to various degrees.

We are aware of one lawsuit involving shoreline protection structures on Lake Huron between landowners immediately south of Bayfield in the ABCA watershed. The ABCA has been named in the suit as well as the municipality. The claim is over a groyne that required significant repair. ABCA's insurance company is involved. Following discussions with ABCA senior staff, several Conservation Authority Best Management Regulations application/violation practices were reiterated as important and need to be included in policy:

1. need to obtain downdrift and updrift adjacent neighbour written approval
2. Conservation Authority site specific peer review by a P. Eng. with expertise in coastal engineering.

Current SCRCA shoreline policy (Board approved Sept 2011) with proposed revision in red:

The shoreline protection has been designed using accepted scientific and coastal engineering principles by a Professional Engineer with experience in coastal processes;

- This includes assessment of and certification that the proposed shoreline protection will not negatively impact updrift or downdrift properties – **regardless of future maintenance practices;**
- Certification that the protection works will not aggravate existing hazards and/or create new hazards to updrift or downdrift properties – **regardless of future maintenance practices;**;
- Updrift and downdrift property owner written approval will be required.

~~The SCRCA reserves the right to request additional technical studies or additional information in order for staff to make a recommendation to the SCRCA Board of Directors on the application.~~

Proposed Revised SCRCA shoreline policy:

The SCRCA reserves the right to request additional technical studies or additional information. SCRCA will generally require shoreline development be reviewed by the CA retained coastal engineer. Costs are to be borne by the proponent. Information and the qualified engineering coastal review is necessary in order for staff to make informed recommendations on applications which are subject to appeal to both the Board of Directors and Mining and Lands Commissioner.

It is important to note that applicants have the right to appeal a Conservation Authority's staff recommendation/decision on proposed development in a shoreline regulated area to the Authority Board of Directors via a hearing process.

Other Conservation Authorities have been contacted for information regarding their costs. Qualified Coastal engineering review costs range from $1500 – 3000.00.
A 100 foot wide fully serviced waterfront property is valued at 1.5 million in Sarnia. A 100 foot wide waterfront property in Ipperwash (Centre) is 1.0 million. These are vacant lot values.

The cost is only 0.3% of the land value; not taking into account dwellings, which are increasing three fold in size and value from original.

Ferne Ave PW_Oct 2016

Staff Report *11.(iii)*

To: Board of Directors
Date: October 26, 2016
From: Patty Hayman, Director of Planning
Subject: 2017 Funding request –Update to 1992 Shoreline Protection Structures Landowner resource

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As mentioned in the 11.(i) memorandum, Lake Huron is experiencing high lake levels and erosion of the shoreline whereas in the last twenty years minimal erosion has occurred due to low lake levels. There are numerous Regulation violations as a result of “knee jerk” installations of (non engineered) sheet steel walls and groynes which can have a significant impact updrift and downdrift of the structure. The St. Clair Region Conservation Authority shoreline is heavily protected with structures that are aging and failing to various degrees.

General recommendations for appropriate shoreline structures is needed for shoreline residents.

SCRCA staff are recommending an update to the January 1992 Design Considerations for Shore Protection Structures. The document is 25 years old. See attached.

Several chapters need to be updated including: water levels, geotechnical considerations, inclusion of Lambton Shores and Sarnia and West Ipperwash dynamic beach information, shoreline protection design concepts and improvements to existing structures, permits and approvals, etc. It is proposed this document be specific to the reaches of SCRCA shoreline with cross sections extractable for residents and that the document and information be made user website friendly for resident use. For example, web site links to applicable structure cross sections and other applicable information for each area.

Cost:

Total	$	50,000.00	based on verbal estimate
Grant		25,000.00	from External grants (infrastructure technology transfer)
			Surplus adjustments, reserves
Pt. Edward		2,500.00)	
Sarnia		7,500.00)	apportionment based on length of
Plympton Wyoming		7,500.00)	shoreline
Lambton Shores		7,500.00)	

Unanimous municipal support will be required to proceed if a joint project with neighbouring lakeshore C.A.’s can be arranged total costs could be reduced by 20%

ST. CLAIR REGION
CONSERVATION AUTHORITY

DESIGN CONSIDERATIONS FOR SHORE PROTECTION STRUCTURES

FINAL DRAFT

W.F. Baird & Associates Coastal Engineers Ltd.

January 1992

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1.0 INTRODUCTION

Ontario's Conservation Authorities have been designated as the lead implementing agencies for the shoreline management programs and policies of the Ontario Ministry of Natural Resources (MNR). The St. Clair Region Conservation Authority (SCRCA) shoreline extents along the southeast shore of Lake Huron from the St. Clair River in the southwest to Hillsboro Beach in the northeast (refer to Figure 1.1). This shoreline includes the City of Sarnia-Clearwater and Plympton Township.

Between the St. Clair River and Brights Grove, the shoreline consists of vegetated dunes generally fronted by wide sandy beaches retained by an extensive groyne system. To the northeast of Brights Grove, the shoreline is characterized by glacial bluffs, increasing in height from low (4 to 6 m) to moderate (up to 18 m) as one moves towards Hillsboro Beach. The bluffs are typically fronted by narrow beaches, and in places by extensive shore protection. These beaches provide only limited protection to the bluffs, and erosion of some of the bluffs is caused by wave action during storms, particularly during periods of high water levels.

Development along the shoreline is characterized by single family residences, typically consisting of permanent homes in Sarnia-Clearwater and a mixture of permanent homes and seasonal cottages in Plympton Township. As a result of this existing development and the ongoing erosion of the shoreline, many properties have constructed shoreline protection, with groynes and seawalls the predominant structures. These structures have affected shoreline processes in the area by reducing the erosion of the shoreline and therefore the supply of sediment to the shore zone. Increasing development pressure in Plympton Township will clearly lead to an increased demand for shoreline protection. The purpose of this document is to present an overview of design considerations for shoreline protection structures in this area, recognizing the presence and performance of existing structures, as well as the impacts of existing and new structures on the shoreline processes. However, it is important to note that the information presented in this report is general in nature and intended for guidance purposes only. It is recommended that a qualified professional be retained to develop shore protection designs for any specific site.


Shoreline Management Plan
Study Area
LAKE HURON
USA
Canada
Hillsboro Beach
Blue Point
Highland Creek
Errol Village
Bonnie Doon Creek
Brights Grove
Perch Creek
Cow Creek
Canatara Park
Point Edward
Sarnia
Plympton
St. Clair River
7
30
40
402

Figure 1.1

2.0 SHORELINE CHARACTERISTICS

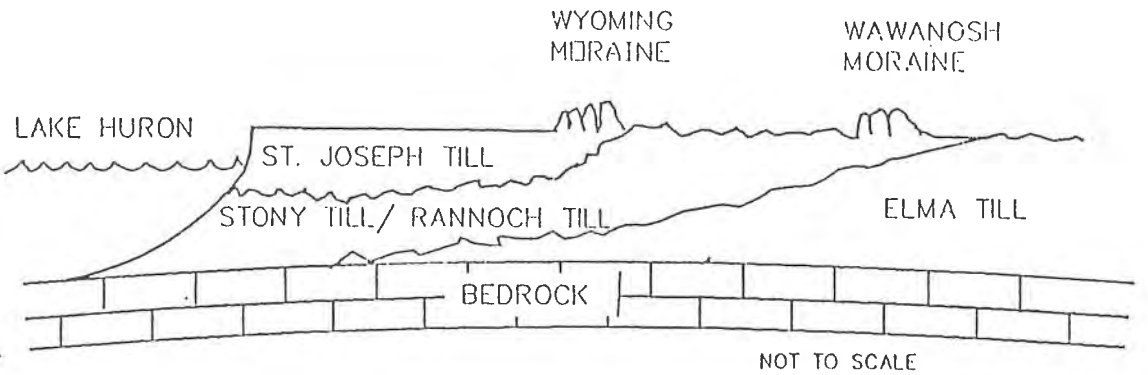
2.1 Introduction

As a result of the glacial history of this area, the entire region is covered by thick deposits of glacial drift. A schematic cross-section through the eastern shoreline of Lake Huron is presented in Figure 2.1, and indicates the presence of bedrock overlain by Rannoch till, which is in turn overlain by St. Joseph till.

These tills contain differing proportions of sand, gravel and boulders in the clay matrix. The Rannoch till is very resistant to wave action, and has significantly affected the evolution of the Lake Huron shoreline. Specifically, the Rannoch till is believed to form submerged shelves throughout this area, acting like bedrock when lag deposits of coarse material armour the exposed surface of the lake bottom. These shallow shelves cause waves to break and dissipate their energy offshore, thus reducing the exposure of the shoreline to wave-induced erosion.

The St. Joseph till is significantly less durable than the Rannoch till. The majority of the exposed bluffs in this area consist of this material, which is readily eroded by wave action. Although wave action at the shore, which is controlled by water levels, is the dominant force in the evolution of the shoreline, the response of the shoreline depends on the composition of the shoreline. Specifically, the presence of exposed Rannoch till on the nearshore lake bottom and base of the bluff results in a relatively stable (non-erodible) shoreline, while the presence of St. Joseph till on the nearshore lake bottom and base of the bluff results in an eroding shoreline (and nearshore lake bottom).

Erosion of the bluffs and lake bottom supplies sediment (clay, silt, sand and gravel) to the shore zone. These materials are transported by wave action and currents. The finer sediments (clay and silt particles) are carried in suspension, and tend to deposit offshore in deep water, while the coarser sediments (sand and gravel particles) are transported along the shoreline and form beaches, dunes and offshore bars. The extent of these beaches and bars is dependent on a number of factors, including the supply of



(From Reinders 1989)

Baird & Associates	SCRCA SHORELINE MANAGEMENT PLAN SCHEMATIC CROSS-SECTION OF LAKE HURON SHORELINE		
	Designed by: kjm	Scale N.T.S.	Date: 15/11/91
	Drawn by: bkc		Figure 2.1

sand and gravel to a particular location, and the nearshore wave climate and water depths.

2.2 Typical Shoreline Types

To the southwest of Brights Grove, the shoreline consists of vegetated dunes generally fronted by wide sandy beaches retained by an extensive groyne system. To the northeast, the shoreline consists of glacial bluffs of low to moderate height fronted by narrow beaches and, in places, extensive shore protection. These bluffs may be either stable or eroding, depending on the nearshore characteristics, exposure to wave action, bluff characteristics etc. Ongoing erosion of some of these bluffs supplies sediment to the nearshore zone which maintains the beaches at locations downdrift (southwest) of the eroding bluff. Typical characteristics of the different shoreline types are presented below.

2.2.1 Beach/Dune Shoreline (St. Clair River to Brights Grove)

In the southwest of the study area, the shoreline consists of dunes fronted by wide sandy beaches retained by an extensive groyne system. The dunes are generally well vegetated, and thus relatively stable, although severe storms at high water levels may expose the dunes to direct wave action which will result in erosion of the dune face. The beaches are relatively dynamic, and constantly change in response to variations in wave action and water levels. Offshore bars may be present, and wind blown losses to the backshore may develop small active dunes.

The unconsolidated sand deposits contained in the dune, beach and bar(s) are located over glacial till. Based on limited observations (visual inspection by a diver) of the nearshore lake bottom characteristics at specific locations along this reach of shoreline, it is hypothesized that the nearshore lake bottom is composed of the armoured Rannoch till along much of the Sarnia-Clearwater shoreline. However, towards the northeast, specifically in the vicinity of Pulse Creek and Brights Grove, the available observations suggest that the nearshore lake bottom consists of the relatively erodible St. Joseph till. This difference in lake bottom characteristics has a significant

impact on the stability of shoreline, as an eroding lake bottom allows larger waves to reach the shoreline, thus increasing shoreline erosion.

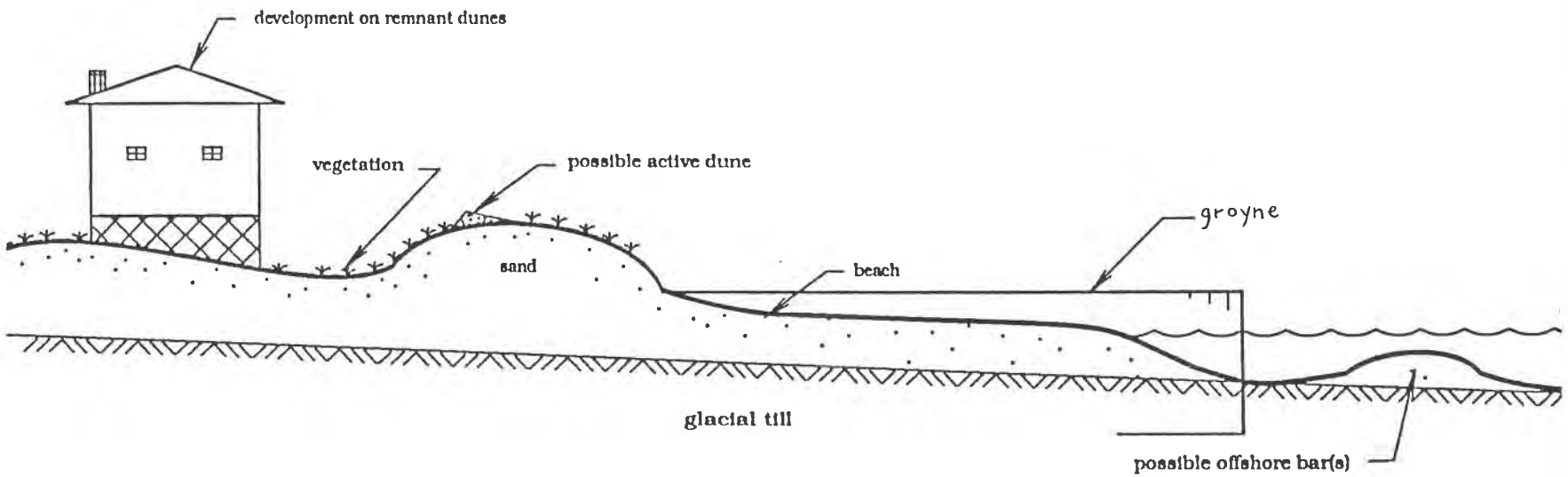
Development of the backshore in this area is intense and of high value, with large single family permanent homes predominating. Steel sheet pile groynes have been constructed along this entire reach of shoreline in an effort to maintain the beaches, and additional protection to the backshore is provided by seawalls in many areas. In some cases, the seawalls are buried in sand trapped between the groynes and fronted by a wide beach (for example, as generally exists along the shoreline within the former City of Sarnia), while in other areas, the retaining wall is directly exposed to wave action on the lake, with no beach and significant water depths directly in front of the wall (for example, at a number of properties in the vicinity of Telfer Side Road). These different shoreline characteristics are related to the nearshore water depths, which are dependent on the erodibility of the nearshore lake bottom, as discussed above.

Typical characteristics of this shoreline type are shown in Figure 2.2.

2.2.2 Glacial Till Bluff Shoreline (Brights Grove to Hillsboro Beach)

To the northeast of Brights Grove, the shoreline consists of glacial till bluffs fronted by narrow beaches. The height of these bluffs increases from low (4 - 6 m) in the vicinity of Brights Grove to moderate (up to 18 m) in the vicinity of Hillsboro Beach. Depending on the nearshore characteristics, exposure to wave action, bluff stratigraphy/characteristics and other factors, the bluffs may be relatively stable or actively eroding. In general, it seems likely that stable bluffs exist where the Rannoch till is exposed in the nearshore area, while eroding bluffs (and nearshore lake bottom) exist where the St. Joseph till is exposed.

Stable bluffs are characterized by a well vegetated slope and a beach of moderate width; such conditions typically occur in areas where the nearshore area is relatively flat and shallow, thus limiting the magnitude of the waves which can reach the shoreline. Eroding bluffs are characterized by a poorly vegetated slope, little or no beach, erosion/undercutting at the toe, and slumping of the face; such conditions typically occur where the nearshore area is relatively steep and deep, which allows greater wave energy to reach the shoreline. It is very important to note that erosion of the bluff face



Baird & Associates	SGRCA SHORELINE MANAGEMENT PLAN BEACH / DUNE SHORELINE – TYPICAL CHARACTERISTICS		
	Designed by: oda	Scale N.T.S.	Date: 20/11/91
	Drawn by: bko		Figure 2.2

is controlled by a corresponding erosion of the nearshore lake bottom. In fact, the stability of the bluff is dependent on the erodibility of the nearshore profile. Erosion of the lake bottom allows larger waves to reach the shoreline, and thus exposes the bluff to increased erosional stress. Thus, it seems likely that in areas where the bluff is eroding, the nearshore profile is composed of a more erodible till (St. Joseph till) than in areas where the bluff is stable (Rannoch till).

The extent of beach deposits in front of the bluff varies considerably, with little or no beach present in front of eroding bluffs, and moderately wide beaches present in front of stable bluffs. Again, offshore bars may be present.

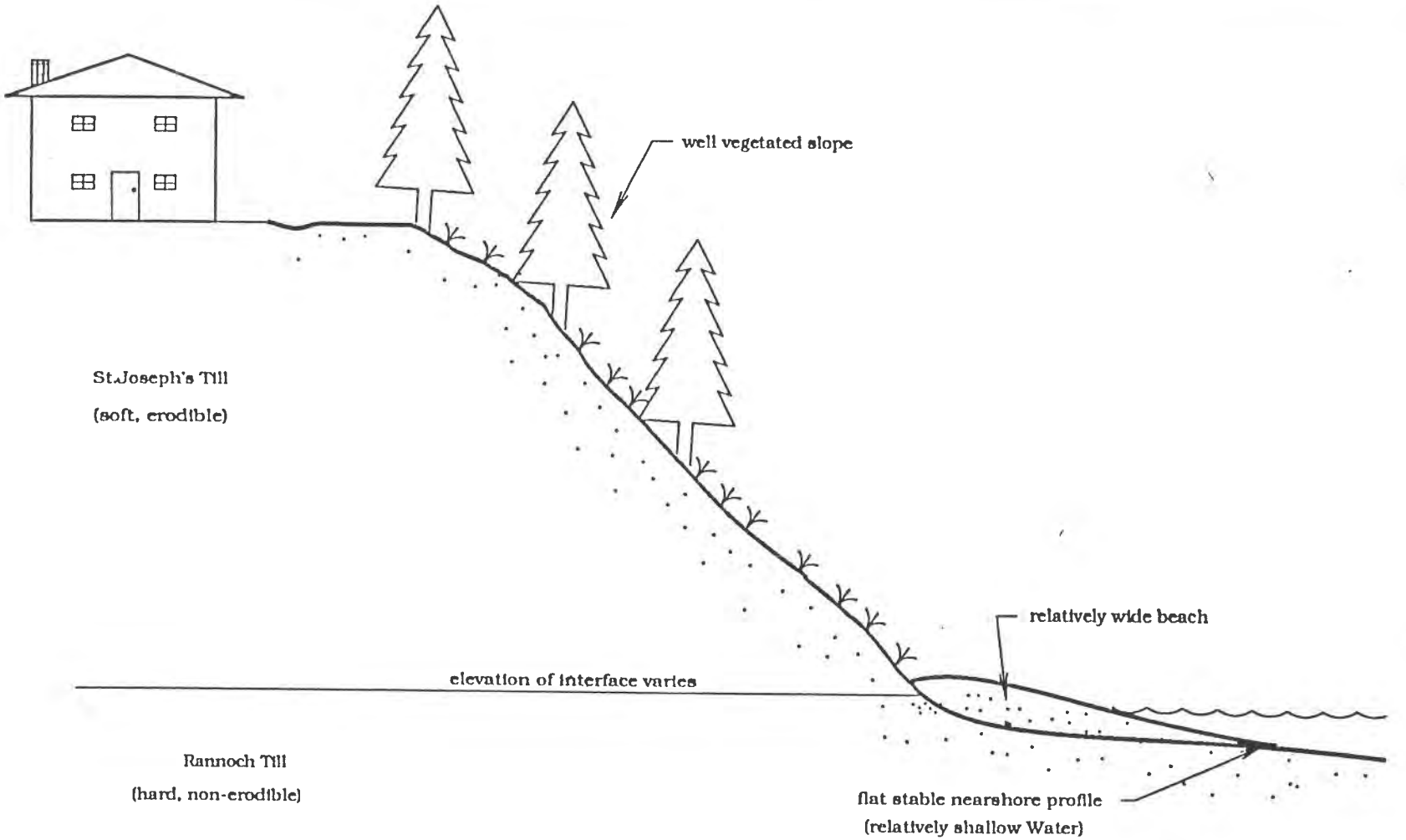
Development of this reach of shoreline is less extensive than to the southwest of Brights Grove, and is characterized by single family seasonal residences on the tableland behind the bluff, or on sand dunes which sometimes exist between the bluff and the beach. Again, shoreline protection structures generally consist of steel sheet pile groynes and seawalls, but to a lesser extent than in Sarina-Clearwater.

Typical characteristics of stable and eroding bluffs are shown in Figures 2.3 and 2.4.

2.3 Sediment Transport/Shoreline Processes

A detailed description of shoreline processes on Lake Huron between Sarina and McRae Point is provided in Reinders (1989). This report documents the alongshore movement of sand occurring within each of four littoral cells on the Lake. Each littoral cell is a "self-contained coastal system, where the ongoing shoreline processes are not affected by the processes of the neighbouring cells". As such, shoreline management of a cell can proceed independently of any other cell. In particular, sand is not transported between cells.

The SCRCA shoreline is located entirely within Littoral Cell #4, which extends from Sarnia to Kettle Point. The cell is further subdivided into four reaches or subcells, based on areas with similar shoreline features or characteristics. The division points between these reaches are Brights Grove, Blue Point and Gustin Grove.

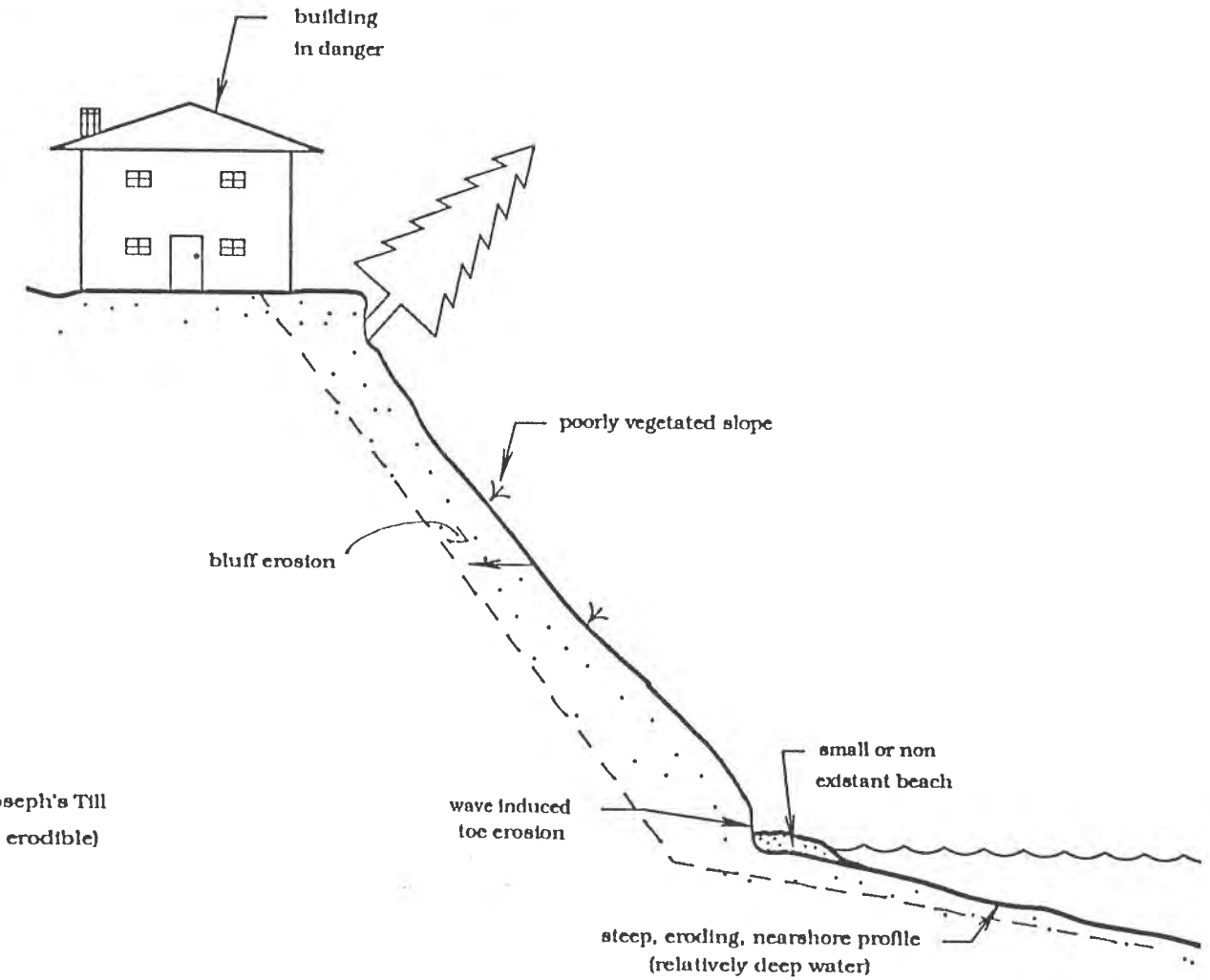


Baird & Associates

SCRCA SHORELINE MANAGEMENT PLAN

STABLE GLACIAL TILL BLUFF SHORELINE
TYPICAL CHARACTERISTICS

Designed by:	Scale	Date:
cda	N.T.S.	15/11/91
Drawn by: bkc		Figure 2.3



Baird & Associates

SCRCA-SHORELINE-MANAGEMENT_PLAN

ERODING GLACIAL TILL BLUFF SHORELINE
TYPICAL CHARACTERISTICS

Designed by:	Scale	Date:
cda	N.T.S.	15/11/91
Drawn by: bkc		Figure 2.4

The littoral material (the sediments along the shoreline) originates from the erosion of the glacial till that makes up the bluffs and lake bottom adjacent to the shoreline. This erosion is the result of wave action undercutting the toe of the bluffs, as well as surface runoff, groundwater flow, freeze-thaw action and other processes. As material is deposited in the nearshore area, it is transported along the shoreline by waves and wave-induced currents, and forms beaches and bars. Coarser material, such as sand and gravel, is transported along the shoreline, while finer material, such as silt and clay, is carried in suspension, with some moving alongshore and some moving offshore.

Due to the orientation of the shoreline in this area relative to the direction of average wave energy, the net transport of littoral material in this area is from northeast to southwest (Kettle Point to Sarnia), although the sediments may move in either direction in response to individual storms. If a sufficient quantity of sand is present, a beach and bar(s) may form, although these will generally be very dynamic in nature. The stability of these features is dependent on a supply of sand from the "updrift" shoreline (i.e. the shoreline to the northeast). This supply of sand is principally provided by the erosion of the bluffs, although smaller quantities are also supplied by erosion of the nearshore lake bottom, erosion of gullies, and discharges from rivers and creeks.

As summarized in Figure 2.5, there is essentially no net transport of material southwest past Gustin Grove due to the rocky and non-erodible shoreline to the northeast. It has been estimated (Reinders, 1989) that between Gustin Grove and Blue Point, the net annual supply of sediment to the littoral system is 12,500 m^3/yr, with bluff erosion accounting for 65% of the supply, and lake bottom erosion accounting for 25% of the supply. Between Blue Point and Brights Grove, the net annual supply of sediment to the littoral system is estimated to be 4,900 m^3/yr, of which 37% is derived from bluff erosion and 53% from lake bottom erosion. Finally, between Brights Grove and the St. Clair River, lake bottom erosion accounts for almost 100% of the estimated 6,500 m^3/yr of sediment which is supplied to the littoral system. Bluff erosion in this area has been reduced by extensive shoreline protection measures. Clearly, erosion of the bluffs to the northeast of Brights Grove provides a significant quantity of sediment to "feed" the beaches to the southwest.

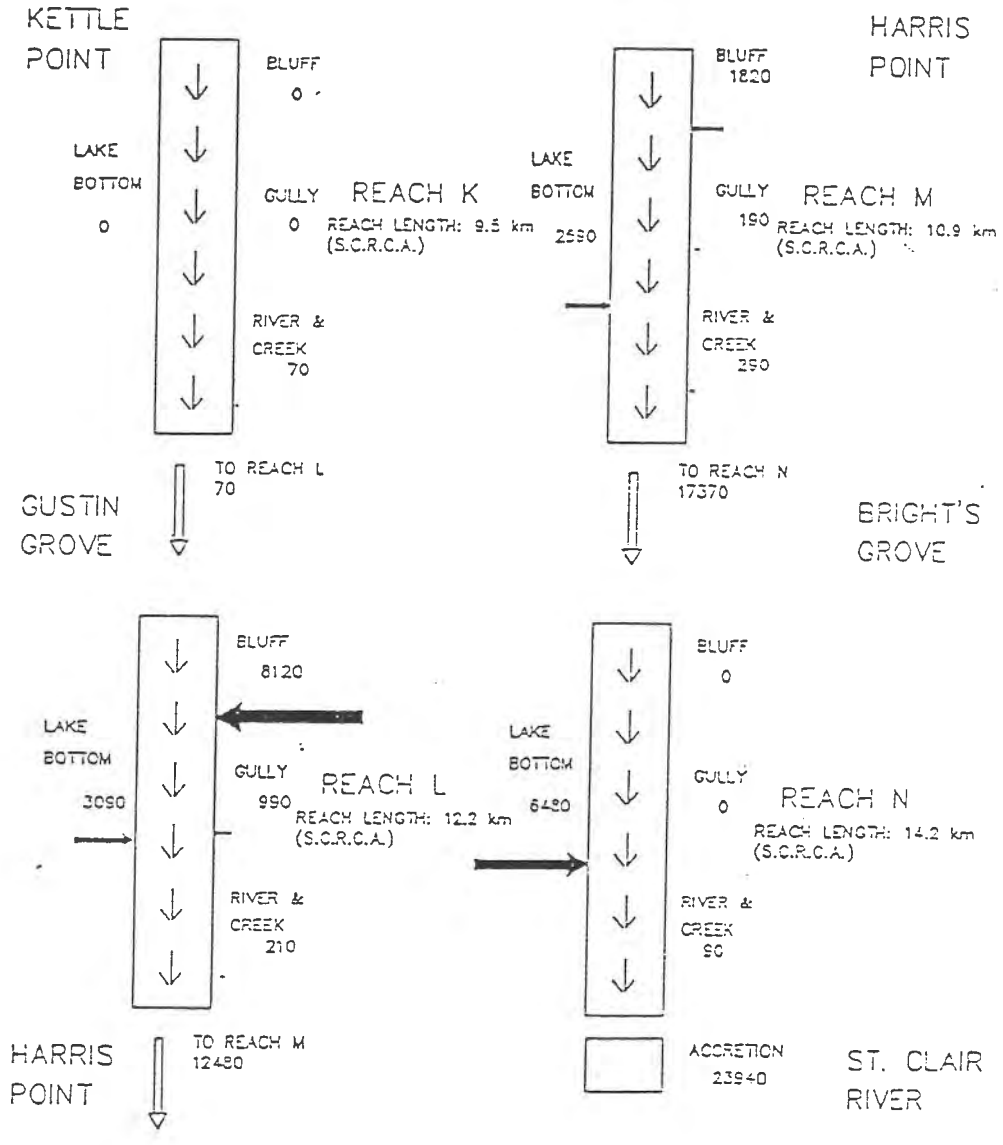


FIGURE SHOWS SUPPLY OF SAND TO EACH REACH FROM THE BLUFF, GULLY, RIVERS AND CREEKS AND LAKE BOTTOM EROSION. ALSO SHOWN IS THE SUPPLY TO AND FROM EACH REACH TO THE ADJACENT REACHES.

NUMBERS SHOWN ARE CUBIC METRES PER YEAR

THIS SIZE OF ARROW INDICATES 5000 CUBIC METERS PER YEAR ARROWS SHOWING SUPPLY ARE SCALED ACCORDINGLY

ARROWS BETWEEN REACHES ARE NOT TO SCALE

INDICATES DIRECTION OF NET TRANSPORT IN EACH REACH

(From Reinders 1989)

Baird & Associates	SCRCA SHORELINE MANAGEMENT PLAN SUMMARY OF SEDIMENT SUPPLY BETWEEN KETTLE POINT AND ST.CLAIR RIVER		
	Designed by: cda	Scale N.T.S.	Date: 15/11/91
	Drawn by: bkc		Figure 2.5

Based on these supply rates, the net annual southwesterly transport rate increases from approximately 0 at Gustin Grove to 24,000 m^3/yr at the St. Clair River. Historically, this material was deposited along the wide sandy beaches at Canatara Park. However, it seems likely that this material now bypasses these beaches and the Sarnia Yacht Club, and is ultimately transported into the St. Clair River. More detailed information on the shoreline processes in each of the four reaches is presented in Appendix A.

As noted earlier, shore protection structures currently exist along a large portion of the SCRCA shoreline, particularly in the Sarnia-Clearwater area. Shoreline protection will tend to reduce the rate of bluff erosion, and will thus reduce the supply of sediment to the littoral zone. Clearly, if all the eroding bluffs to the northeast of Brights Grove were fully protected, this would have a significant impact on the beaches to the southwest. The existing protection, which generally consists of steel sheet pile groynes and seawalls, does not fully protect the bluffs, particularly during severe storms at high water levels. Thus, long term erosion of the bluffs has not been fully eliminated. In addition, localized impacts associated with the construction of groynefields have occurred, generally consisting of increased erosion immediately downdrift of a new groynefield prior to its filling by natural processes. Finally, it is important to note that although shoreline protection can be designed and constructed to reduce or eliminate bluff erosion, it will have no effect on nearshore lake bottom erosion. At locations where the nearshore lake bottom is composed of the erodible St. Joseph till, this process must be considered in the design of any shoreline protection structure with a design life greater than approximately 5 to 10 years.

3.0 DESIGN CONDITIONS

3.1 Water Levels

Water levels on Lake Huron vary substantially in both the long and short term, as well as seasonally. Long term variations are the result of climatic changes, in particular precipitation and evaporation. The most recent period of high lake levels was 1985-86, while the most recent period of low lake levels was 1964-65. On Lake Huron, the difference between the maximum and minimum annual mean lake levels recorded since 1920 is 1.6 m (Environment Canada, 1988). It is important to note that due to the size of the Great Lakes and the limited discharge capacities of their outflow rivers, extreme high or low lake levels will persist for a period of years after the factors that caused them have changed.

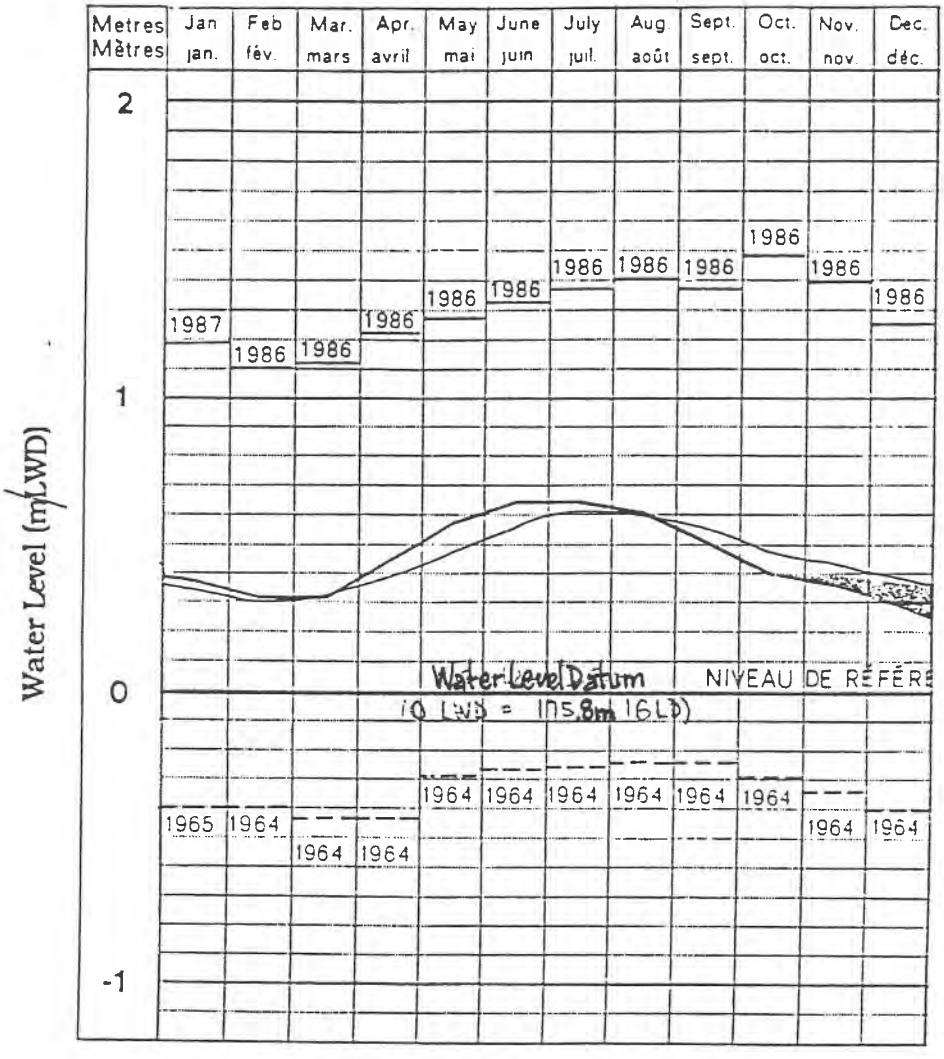
Seasonal fluctuations in the lake level are associated with the annual weather pattern. The lowest levels typically occur in the winter when most precipitation is snow and ice, while the highest lake levels typically occur in the summer following spring runoff. On Lake Huron, the average seasonal water level fluctuation is approximately 0.3 m. (Environment Canada, September 1991). Figure 3.1 shows the seasonal fluctuations in the average, maximum and minimum monthly mean water levels on Lake Huron between 1916 and 1991. These water levels are referenced to Lake Huron low water datum (LWD), which is equal to 175.8 m International Great Lakes Datum (IGLD). In order to convert LWD elevations to IGLD elevations, one must add 175.8 to the LWD values.

Finally, short term (hours or days) fluctuations in the water level occur due to the passage of weather systems, with wind stress on the water surface and atmospheric pressure changes causing localized setups referred to as storm surge, as shown in Figure 3.2. Storm surges along the SCRCA shoreline may range from 0.5 to 1.0 m depending on the severity of a particular storm (Reinders, 1989).

There is considerable debate in the scientific and engineering communities concerning the selection of design water levels for coastal structures on the Great Lakes. Although

LAKE HURON (Goderich)

(1916 - 1991)



Legend

Maximum

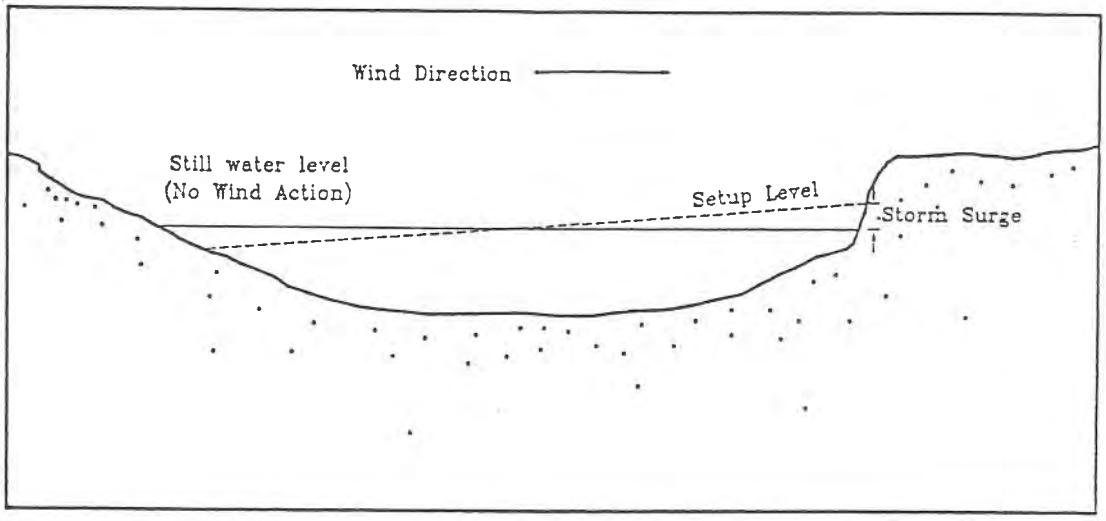
Average

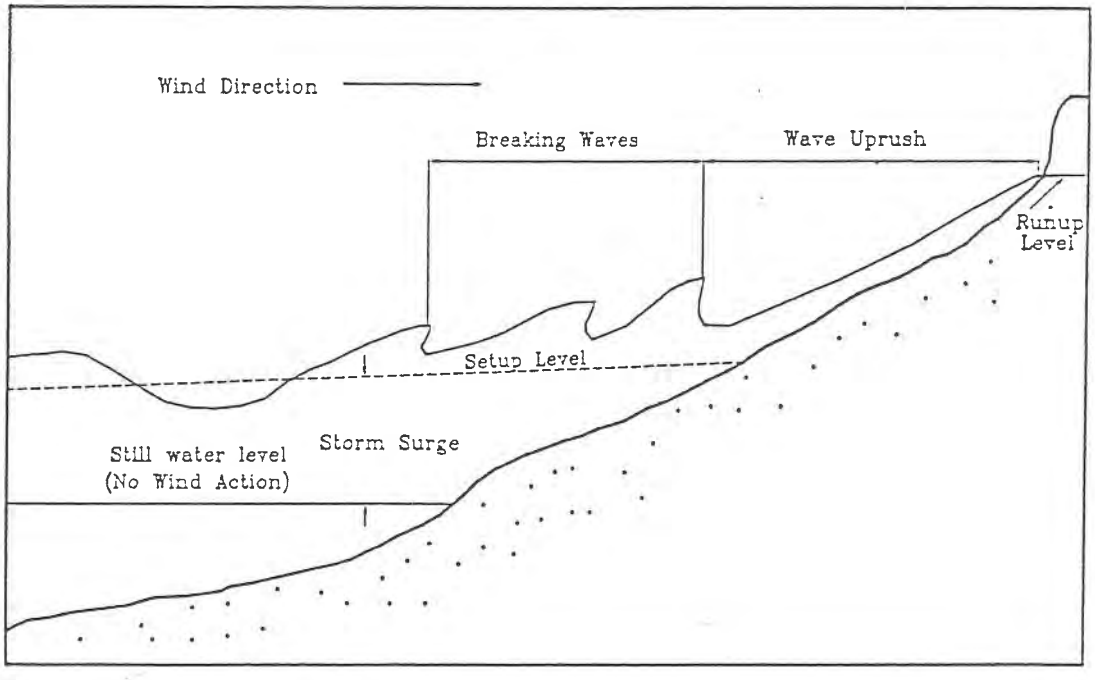
Minimum

1991 Recorded

Probable

Baird & Associates	SHORELINE MANAGEMENT PLAN SEASONAL WATER LEVEL FLUCTUATIONS ON LAKE HURON		
	Designed by: cda	Scale	Date: 15/11/91
	Drawn by: bkc		Figure 3.1





Baird & Associates	SCRCA SHORELINE MANAGEMENT PLAN SCHEMATIC DIAGRAM OF STORM SURGE		
	Designed by: cda	Scale N.T.S.	Date: 15/11/91
	Drawn by: bkc		Figure 3.2

the application of standard statistical techniques (such as frequency and extreme value analyses) is not strictly applicable to Great Lakes water levels, both MNR (1989) in Ontario and the U.S. Army Corps of Engineers (USACOE, 1988) in the U.S.A. have utilized such techniques to establish extreme water levels associated with selected return periods. For the purposes of preliminary design of shoreline protection structures, the MNR (1989) results will be used to define the design water levels. A summary of these results for the shoreline between Sarnia and Kettle Point is presented below in Table 3.1.

Table 3.1

Design Water Levels
(from MNR, 1989)

Return Period (years)	Water Level (m LWD)*	
	Sarnia - Blue Pt.	Blue Pt. - Kettle Pt.
5	+1.5	+1.4
10	+1.7	+1.6
25	+1.85	+1.7
100	+2.0	+1.9

*Note: 0 LWD = 175.8 m IGLD 1955

A direct comparison between these estimated design water levels and recorded extreme levels is not possible, as the available recorded water level data are not representative of conditions along this reach of shoreline. Specifically, the Environment Canada water level gauge at Goderich does not measure the short term fluctuations which occur at the south end of the lake, while the gauge at Point Edward is located on the St. Clair River and is thus not representative of conditions along the adjacent Lake Huron shoreline. However, an estimate of the extreme water level which occurred along the SCRCA shoreline during the March 1973 storm was developed by adding the recorded monthly mean lake level (+1.0 m LWD) to the estimated storm surge for this event (1.0

m, calculated using recorded wind data and a computer program developed by the Great Lakes Environmental Research Laboratory (1987)), resulting in an extreme level of +2.0 m LWD. Thus, based on the MNR results, this event had a return period in the order of 100 years. It is interesting to note that during the most recent high water period on the Great Lakes (1985-86), the Lake Huron levels were higher than they had been in 1973-74, with the still water level reaching a maximum monthly mean level of +1.5 m LWD in October 1986, as compared to the previous maximum of +1.3 m LWD in July - August 1973 and July 1974.

The selection of a design water level is of critical importance to the design of a shoreline protection structure, as the wave height acting on a structure in shallow water adjacent to the shoreline will be limited by the depth of water. Higher water levels will allow larger waves to reach the structure, thus requiring more substantial structures. Similarly, erosion of the nearshore lake bottom will allow larger waves to reach structures adjacent to the shoreline, and must be considered for structures with a design life greater than approximately 5 to 10 years at locations where the nearshore lake bottom consists of the erodible St. Joseph till.

3.2 Nearshore Lake Bottom Erosion

As noted earlier, the nearshore typically consists of a beach of varying width deposited over glacial till. The beach is very dynamic in nature, constantly changing in response to varying wave action and water levels. In addition, one or more sand bars may be present depending on the supply of sand. Clearly, the design of any shoreline protection structure must recognize the dynamic nature of the beach, and should not be dependent on the presence of the beach for its stability. An analysis of long term beach stability is relatively complicated, and such site specific investigations are beyond the scope of this study.

In addition, the design of shoreline protection structures must consider the slow, but ongoing, erosion of the nearshore lake bottom. This process is relatively independent of water level fluctuations, with erosion of the lake bottom continuing during periods of low water, as well as during periods of average and high water. The erosion may be insignificant over the short term, but will have significant implications to shoreline protection in the long term. Specifically, erosion of the nearshore lake bottom in front of the structure.

Important is the fact that this process will result in deeper water in front of the structure, thus allowing larger waves to attack the structure. For shore protection to be effective over the long term (greater than 5 to 10 years), the design must consider the future erosion of the lake bottom, and the larger waves which will attack the structure in the future.

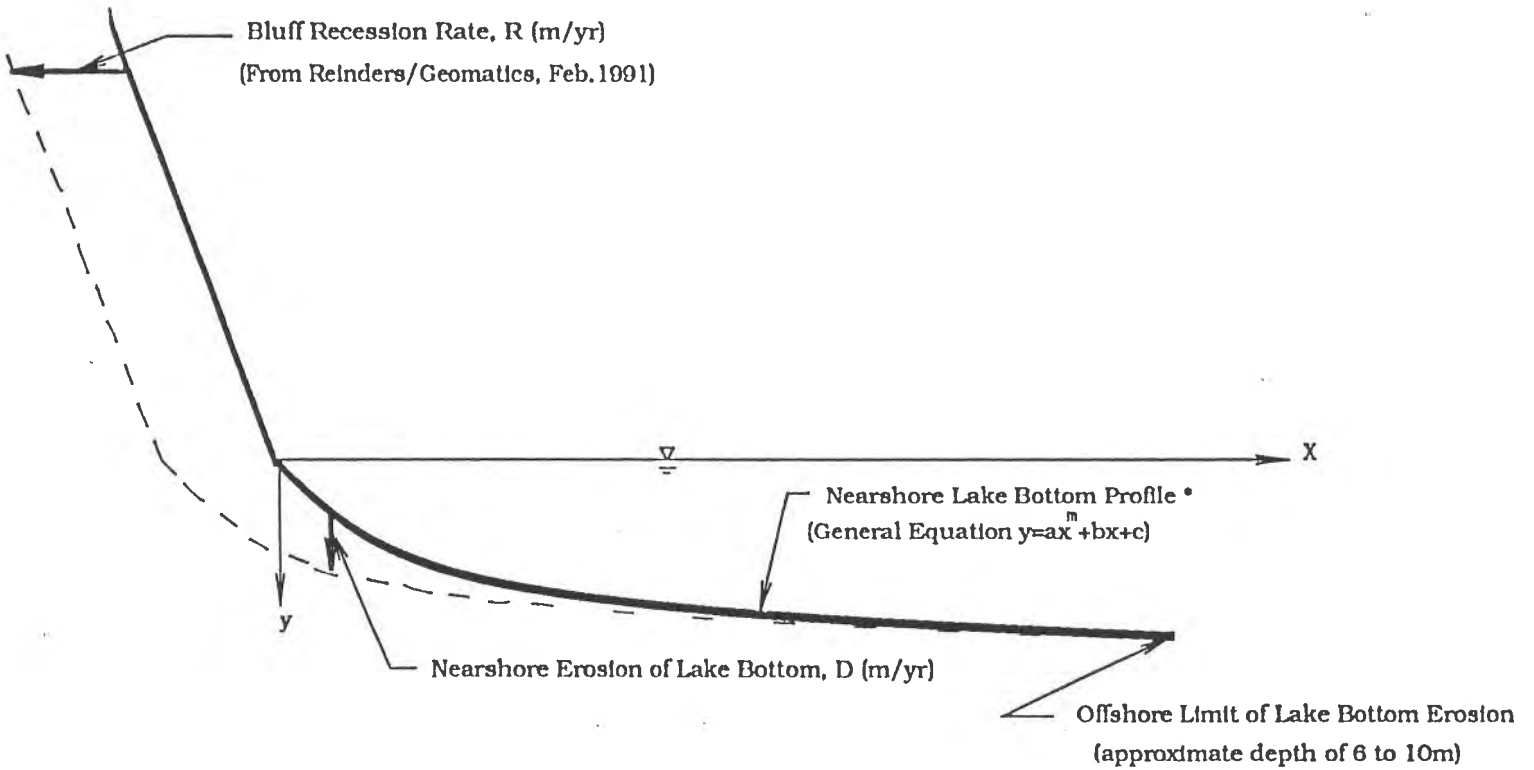
No measurements of this process are available in the study area, and only limited measurements are available at other locations on the Great Lakes. For example, Davidson-Arnott (1986) undertook field measurements to monitor this process along the southern Lake Ontario shoreline between Hamilton and Grimsby, and found that the rate of lake bottom erosion was in the order of 5 cm per year (vertical erosion) immediately adjacent to the shoreline, and decreased as one moved offshore into deeper water.

It is generally thought that the process of nearshore lake bottom erosion involves a landward shift of the nearshore profile at the same rate as bluff recession in the area, with the nearshore profile retaining its original shape. Thus, in order to estimate the long term erosion of the nearshore lake bottom, a methodology was developed

to relate the lake bottom erosion (D) to the shape of the nearshore profile, the average annual bluff recession rate (R) and the time period of interest (t), as illustrated in Figure 3.3.

Initially, a nearshore profile with a general shape defined by the equation $y = ax^m + bx + c$ was assumed, where x is the distance offshore from the shoreline and y is the water depth below assumed datum. The constants a, b, c and m must be evaluated for a particular site using information on water depths and lake bottom slopes at different distances offshore. For example, a typical nearshore profile in the vicinity of Brights Grove has zero depth and a 1:20 slope at the shoreline, and a 6 m depth and 1:500 slope at 1000 m offshore. Using this information (obtained from CHS chart 2260 and Letham, Jarvela and Robertson (1983)), the site specific profile equation was found to be $y = -0.0235\,x^{1.091} + 0.05x$.

This equation represents the existing profile at time t = 0. In order to account for the future erosion of this profile, it is assumed that the profile shifts landward at the bluff recession rate, R. Thus, after t years, the horizontal shift would be Rt. The future profile after any time, t, can be estimated by the transformed equation $y = -0.0235\,(x - Rt)^{1.091} +$



*Notes: -nearshore lake bottom profile assumed to have a concave shape
-constants in equation (a,b,c and m) determined using site specific bathymetric data including depths (y) and slopes (dy/dx) at specified offshore distances (x)

Baird & Associates	SCRCA SHORELINE MANAGEMENT PLAN SCHEMATIC DIAGRAM OF BLUFF AND NEARSHORE LAKE EROSION		
	Designed by: kjm	Scale	Date: 15/11/91
	Drawn by: bkc		Figure 3.3

0.05 (x - Rt). The lowering of the lake bottom at any location, x, can now be estimated by the difference in depths, y, at present (t = 0) and any time, t, in the future for any specified bluff recession rate, R. For example, Table 3.2 illustrates the deepening (erosion) of the nearshore lake bottom as a function of the quantity Rt for the profile described above.

Table 3.2

Erosion of the Nearshore Lake Bottom
for Typical Nearshore Profile at Brights Grove

Offshore Distance x(m)	Existing Water Depth (m)	Rt =	Future Water Depth (m) vs. Rt						
			1	2	5	10	20	50	100
0	0.00		0.03	0.05	0.11	0.21	0.38	0.82	1.43
15	0.30		0.32	0.33	0.38	0.46	0.61	1.02	1.59
34	0.60		0.61	0.63	0.67	0.74	0.88	1.25	1.78
56	0.90		0.91	0.93	0.97	1.03	1.15	1.49	2.00
80	1.20		1.21	1.22	1.26	1.31	1.43	1.74	2.21
107	1.50		1.51	1.52	1.56	1.61	1.71	2.00	2.45

For example, assuming a bluff recession rate of 0.5 m/yr and a time span of 100 years (i.e. Rt = 50), the water depth at the present shoreline location will increase from 0 to 0.82 m over this period. A similar increase in depth would occur with a bluff recession rate of 1.0 m/yr over a period of 50 years (or any other combination of R and t yielding Rt = 50).

The approach described above should be utilized to estimate the future lake bottom elevation and water depth to be used in the design of any shoreline protection structure, in particular where a structure is intended to provide medium to long term protection in

an area of moderate to severe erosion, as defined by an Rt value greater than 15. In these cases, overlooking the process of lake bed erosion may result in damage to or failure of the structure due to undermining and/or exposure to waves exceeding the design condition.

3.3 Waves

Deep water wave conditions offshore of the SCRCA shoreline have been estimated using wind-wave hindcast procedures by both MNR (1988) and USACOE (Hubertz, 1989). Both of these organizations have long term hourly wave data available at various locations along this shoreline. These data are available in summary presentations, including scatterplots (which show the frequency of occurrence of different wave heights and period by direction) and wave roses, as well as hourly time series in digital files. An estimate of nearshore wave conditions requires a site specific investigation of shallow water transformations, including refraction, shoaling, diffraction and breaking. These processes are discussed in detail in the Shore Protection Manual (USACOE, 1977, 1984).

The design wave height incident on a shoreline protection structure along this section of shoreline will be depth-limited. In other words, the magnitude of the largest wave which can impact the structure is controlled by the water depth in front of the structure. Although the nearshore slope will also affect the magnitude of the "breaking" waves, one can assume that the maximum wave height will be limited to approximately 80% of the water depth in front of the structure. An improved estimate of the design breaking wave height, which considers the slope of the nearshore lake bottom, can be developed using procedures presented in the Shore Protection Manual (USACOE, 1977, 1984) or in Goda (1970, 1985).

Clearly, water level variations and long term erosion of the nearshore lake bottom must be considered in establishing the design water depth and design wave height for a structure. Higher water levels, and erosion of the lake bottom, will both allow larger waves to reach the structure, and will have a significant impact on the design of shoreline protection structures. Thus, prior to determining the design wave height, one must establish the existing water depth in front of the proposed structure, and then add allowances for the design water level (considering both high lake levels and storm

surges - refer to Section 3.1) and nearshore erosion (refer to Section 3.2) associated with the selected design life of the proposed structure. For preliminary design purposes, the design wave height can then be estimated as 80% of the total water depth. Table 3.3 summarizes the design water depth and preliminary design wave height for selected conditions. A more refined estimate of the design wave height should be developed during the final design phase.

Table 3.3

Design Water Depths and Preliminary Design Wave Heights
(typical nearshore profile, R = 1.0 m/yr)

Design Life (t) (years)	Design Water Level (m Chart Datum)	Rt (m)	Future Water Depth at Existing Shoreline Location (m Chart Datum)	Total Water Depth (m)	Design Wave Height (m)
5	+1.4	5	-0.1	1.5	1.2
10	+1.6	10	-0.2	1.8	1.4
25	+1.7	25	-0.5	2.2	1.7
100	+1.9	100	-1.4	3.3	2.7

Chart Datum = 176.0 metres IGLD 1985

It is important to note that an increase in design wave height will result in a significant increase in the cost of a shoreline protection structure. For example, in the case of revetments, the geometric dimensions of the structure are proportional to the design wave height, while the stone sizes are proportional to the cube of the wave height. Thus, doubling the design wave height, as is more or less required to go from short term (5 to 10 years) to long term (100 years) protection, will require a significantly larger structure (higher and wider crest, and deeper excavation for toe) protected by much larger stones. This would result in a significant increase in construction cost (perhaps by an order of magnitude), although maintenance, repair and replacement costs would be reduced or eliminated. Groynes and seawalls are also sensitive to the design wave height, although perhaps not as dramatically as revetments. However, groynes can not be expected to fully protect the shoreline under very severe conditions (extreme storms at high water

levels), and would therefore require secondary protection in the form of a revetment or seawall buried behind the beach in order to prevent erosion under these conditions.

3.4 Ice Conditions

Ice forces must be considered in the design of any coastal structure on the Great Lakes. Horizontal ice forces may be caused by thermal expansion of the ice sheet or by moving ice flows. Vertical ice forces may be caused by variations in the water level if the ice sheet has affixed itself to a structure. In general, vertical structures are more susceptible to ice damage than sloping structures, and Great Lakes experience suggests a horizontal design force in the order of 10,000 lb/ft for such structures. Piles are also susceptible to "ice jacking", which refers to the process in which the ice sheet freezes to the pile and may lift it when a rise in water level occurs. This process is generally irreversible, as a fall in water level generally causes fracture of the ice sheet adjacent to the pile rather than pushing the pile back into the ground. As a result, water level fluctuations during the winter, in particular the seasonal rise in water level which occurs each spring (March-April, see Figure 3.1) may progressively lift the pile, thereby reducing the pile penetration depth into the lake bottom and thus reducing its ability to resist loading conditions in the future. Thus, piles must be driven to a sufficient embedment depth to resist the forces associated with this process.

In general, the design of shore protection to resist ice forces is based on experience rather than analyses. Inspection of existing shoreline protection structures in this area demonstrates the susceptibility of the lakeward ends of steel sheet pile groynes to ice damage. As such, approaches to minimize this damage are presented later in this report. Existing revetments and seawalls in this area do not appear to have suffered any significant ice-related damage.

3.5 Geotechnical Considerations

An assessment of the foundation conditions should be undertaken prior to the design of any shoreline protection structure. Specifically, it is important to identify the presence of soft materials, which might result in excessive settlement and failure of the structure, and the presence of extremely hard materials, which might limit pile

↖ subsurface

embedment depths. Along this shoreline, the nearshore area generally consists of a thin layer of unconsolidated beach deposits over glacial till. This till may be relatively soft and erodible (St. Joseph till), or relatively hard and non-erodible (Rannoch till). As noted earlier, the beach is very dynamic in nature, and any shoreline structure should be founded on the underlying glacial till. Further, the design should consider the erosion of the glacial till on the nearshore lake bottom if it is intended to provide long term protection to the shoreline. With respect to revetments, this will require excavation to the expected erosion depth or to the hard Rannoch till, whichever is reached first, in order to provide a stable foundation for the structure. With respect to sheet pile structures, this will require sufficient embedment depths and reinforcing or anchoring details to resist the applied loads under both existing and future conditions. Finally, given the extent of steel sheet pile structures (groynes and seawalls) in this area, it does not appear that the glacial till presents any significant problems to pile driving operations associated with the construction of these structures.

Bluff stability is a separate issue from the geotechnical considerations associated with shoreline protection, and is discussed briefly in Section 5.

4.0 SHORELINE PROTECTION DESIGN CONCEPTS

4.1 Introduction

Numerous alternatives exist to protect shoreline property, ranging from low cost approaches which provide limited protection to a specific area over a short period of time to high cost approaches which provide complete protection to an entire reach of shoreline over an extended period of time. Overviews of the full range of approaches available are presented in MNR (1986) and USACOE (1978, 1991). This document concentrates on engineered shoreline protection which can be undertaken by individuals or by a community. A community approach has numerous advantages compared to an individual approach, and is strongly recommended. Low cost approaches, such as gabion basket groynes and some seawalls, are not discussed, as these forms of shoreline protection provide only limited protection, and generally have a short design life. In addition, large scale projects, such as offshore breakwaters and artificial beach/headland systems, are also not discussed, as these approaches are relatively expensive. Rather, this document focuses on shoreline protection measures which have been tried and proven along this reach of shoreline, specifically groynes, revetments and seawalls. This includes a discussion of the existing shoreline protection system, as well as methods to improve/upgrade the performance of the existing structures.

The selection of a particular approach, including the type of structure and an appropriate design life, is a complicated decision which must consider many factors, including cost (capital and maintenance), performance (protection to the shoreline), aesthetics (principally the structure elevation), access (to the water), and impacts on the nearshore environment and neighbouring shoreline properties. These impacts may extend beyond the immediately adjacent areas and could affect the entire downdrift shoreline as a result of reduced sediment supply to the nearshore system caused by reduced erosion of the backshore. Finally, it is important to note that shoreline protection can reduce or eliminate erosion of the backshore, but the long term erosion of the nearshore lake bottom will continue. Thus shore protection designs must consider this future deepening of the nearshore, or suffer the consequences, which will

ultimately lead to a requirement for costly maintenance/repair/replacement works or alternatively retreat from the shoreline, an option which should also be considered at this time. of threatened development

The following sections provide a summary of the existing shoreline protection system along the SCRCA shoreline, detailed descriptions of the different concepts and their advantages and disadvantages, preliminary designs for new structures suited to application along this shoreline, and finally recommendations for upgrading/ improving the existing shoreline protection system. It is emphasized that the designs presented in this report are preliminary in nature. **Final designs should be developed on a site specific basis, within the overall framework of the Shoreline Management Plan (SMP), by a qualified coastal engineer.** Issues associated with implementation of these designs are discussed in Section 6, and include final design, permits and approvals, financing, construction, monitoring and maintenance.

4.2 Existing Shoreline Protection System

There is a long history of shoreline protection along the SCRCA shoreline, particularly in the Sarnia-Clearwater area, where development along the shoreline is relatively intensive. An extensive system of timber groynes was constructed in the 1950's in response to high lake levels at that time. These structures were allowed to deteriorate through the 1960's during a period of relatively low lake levels. Rising lake levels in the early 1970's resulted in increasing shoreline erosion, and a number of steel sheetpile groynes were constructed in an effort to protect the shoreline. However, a severe storm on March 17, 1973 caused extensive damage to shoreline property and municipal infrastructure throughout the area.

In response to this storm damage, an extensive system of steel sheet pile groynes and seawalls was constructed. This system has been relatively effective in protecting the shoreline and backshore development from continuing erosion damage. However, there are ongoing maintenance problems associated with localized damage/failures of the seawalls and ice damage at the ends of the groynes, as well as long term deterioration of the sheetpile components exposed to the harsh shoreline environment. Maintenance/remedial works have included dumping construction rubble in front of the seawalls, reconstruction of groynes and seawalls with "improved" designs (thicker

sheetpiles, additional reinforcing members, tie backs, increased elevation etc.), and construction of sill walls in front of the seawalls. In addition, a large armour stone revetment has recently been constructed adjacent to Old Lakeshore Road in the vicinity of the Bridgen Side Road in Brights Grove. Unfortunately, some of these measures, in particular the use of construction rubble with exposed steel reinforcement, have resulted in a relatively unattractive and unusable shoreline in certain areas, difficult access and significant safety hazards. On the other hand, some measures have resulted in improved aesthetics and access.

An additional concern along this shoreline is the lack of adequate beaches to meet shoreline protection and public recreation requirements. Contributing factors to this problem include limited littoral drift (i.e limited quantity of sand in the nearshore area), steep nearshore slopes (i.e. deep water) in some areas, the design of the existing shore protection structures (reflective vertical walls), and the extent of updrift shore protection (which reduces shoreline erosion and thereby limits the supply of sediment to the downdrift area). A community or regional beach nourishment program has never been attempted in this area, nor have individual property owners ever "prefilled" their groynes.

Shoreline protection in Plympton Township is much less extensive, due to the lower intensity of development in this area, although a number of cottage subdivisions are protected by steel sheet pile groyne fields, sometimes supplemented by vertical seawalls at the back of the beach. Other subdivisions have no or only minimal protection, such as rock filled gabion basket groynes and seawalls. The effectiveness of the groyne fields in retaining a beach varies considerably. In general, it appears that the beaches do provide some protection to the backshore at low to average lake levels; however, no significant protection would be expected during a severe storm at high water levels, such as that which occurred in March 1973.

The following sections of this report discuss the basic concepts, advantages and disadvantages of groynes, revetments and seawalls. Recommended preliminary designs for these structures are also presented, followed by a discussion of approaches to improve/upgrade the performance of existing shoreline protection structures.

4.3 Groynes

4.3.1 Concept and Discussion

Groynes are structures built perpendicular (more or less) to the shore to encourage the development, or prevent the erosion, of a beach. They accomplish this by reorienting the beach such that the alongshore transport of these coarse materials, which is partially dependent on the angle of incidence of the waves relative to the shoreline, is reduced or eliminated. Groynes generally extend across the normal breaker zone, thus reducing or eliminating the alongshore transport of coarser sediment fractions close to the shore (on the beach and inner bar(s)), but not significantly affecting the alongshore transport of finer material on the outer bar(s).

Groynes are a popular form of shore protection that may increase beach stability and size, and provide effective shoreline protection at a relatively low cost compared to other alternatives. However, groyne design is relatively complex, and the concept is not applicable to all situations. For example, groynes are dependent on a sufficient supply of littoral drift to "feed" the beaches (alternatively, artificial beach nourishment may also be utilized). Also, in general, **groynes can not, on their own, provide full protection to the backshore under extreme conditions** (severe storms at high water levels).

There is considerable debate in the scientific and engineering communities concerning the use of groynes as shoreline protection, particularly on the Great Lakes, where their application is complicated by long term water level fluctuations and where poor design and implementation have often resulted in relatively ineffective shore protection and significant downdrift impacts. For example, Kamphuis (1990) identifies two types of downdrift erosion associated with the construction of a groyne field, as summarized below:

Type I Erosion
- caused by groynes reducing or eliminating the sediment transport close to shore which would normally pass into the next downdrift section of shoreline (i.e. onto the neighbour's beach)
- theoretically, prefilling the groynes will eliminate this erosion.

Type II Erosion - caused by local currents diverting sediment leaving the downdrift end of a groyne cell to the nearest offshore bar, where it is subsequently transported in an alongshore direction while also moving slowing back towards the shoreline.

- even full groynes, which bypass all the littoral drift, will cause Type II erosion.

Kamphuis goes on to note that both of these effects are intensified by the nature of Great Lakes water level fluctuations, notably the long term variations and the absence of tides. Specifically, he suggests that even pre-filled groynes will be emptied by more severe nearshore wave conditions associated with higher water levels, resulting in the onset of Type I erosion. Independently, Type II erosion is accentuated by the absence of tides on the Great Lakes, which allows the formation of very clearly defined bars.

An excellent guide to the use of groynes has recently been published by the Construction Industry Research and Information Association of the United Kingdom (CIRIA, 1990). This reference provides guidance with respect to the types of shorelines where groynes may or may not be appropriate. For example, the CIRIA report states:

"The situation where only a thin layer of mobile beach material exists on a solid geological platform is commonly encountered. The introduction of a groyne system alone is unlikely to stabilize the beach, as the increase in turbulence they cause, coupled with the deflection of currents offshore, will most likely lead to the loss of what little mobile beach already exists."

It also notes that groynes alone are not likely to be effective under the following conditions, all of which are relevant to the SCRCA shoreline:

- the supply of littoral drift (mobile beach material) to the shoreline is insufficient to provide the required beach nourishment;

- the backshore is erodible, and there is a risk of the groyne system being outflanked at the landward ends of the groynes;

- the supply of mobile beach material only provides a thin cover over a solid bed.

Artificial beach nourishment and/or supplementary shore parallel protection (revetments or seawalls) may be required in conjunction with groynes to provide effective shoreline protection under these conditions.

Based on the recent technical literature, the application of a groyne field along the SCRCA shoreline must be seriously questioned. However, on the other hand, groynes have been in place along this shoreline for the past 40 years, and have clearly assisted in developing and maintaining a beach in certain areas. These beaches have resulted in improved access to and enhanced recreational benefits along the shoreline. In addition, they have assisted in protecting the shoreline over this period, although the level of protection has been limited during extreme conditions, such as the storm of March 17, 1973. Further, specific cases of significant downdrift impacts have not been reported in this area. In fact, local and regional impacts may have been limited by the relatively rapid proliferation of groynes throughout the area, as opposed to the construction of an isolated groyne field on an otherwise unprotected shoreline.

One can conclude that an **effective groyne system** along the SCRCA shoreline would have the following characteristics:

1) located in an area with a stable (non-eroding) lake bottom (i.e. erosion resistant Rannoch till);

2) a continuous, and consistent, series of groynes (i.e. uniform spacing and lengths);

3) elevation and length of groynes sufficient to retain beaches during periods of high water levels (alternatively, shore parallel structures, such as revetments, could provide the additional protection required during extreme conditions);

4) a sufficient supply of sand to maintain the beaches;

5) a sediment grain size sufficiently coarse to provide stable beaches during periods of high water (alternatively, beach nourishment could be placed following severe erosion events).

Points 1, 2, and 4 have applied to the groyne system along the Sarnia shoreline in the past. The application of point 3 must consider the questions of aesthetics and risk. Groynes which are higher than those presently existing would allow increased beach development (assuming a sufficient supply of suitable granular material), but would also be a major obstacle along the shoreline. Finally, points 4 and 5 must be significant concerns for the future, as increasing shoreline protection will further restrict the already limited supply of littoral material along this shoreline, thus suggesting the need for artificial beach nourishment in the future. Given the large number of groynes which already exist along the SCRCA shoreline, any discussion of design considerations for shore protection must acknowledge their existence, and incorporate recommendations to improve/upgrade their performance where required. The following discussion focuses on new groyne fields, as might be implemented in areas of Plympton Township, while Section 4.6 focuses on improving/upgrading the performance of the existing shoreline protection system.

4.3.2 Advantages

Groynes have a number of advantages over other popular methods of shore protection. Compared to a shore parallel structure, which may greatly limit access to the beach, groynes allow very easy access to the water for boating and other recreation. They require no special ramps or stairs to get to the beach area, as a shore parallel structure might.

A second major advantage is the increased recreation space that is present after the groyne structures have been filled with sand (by natural processes or artificial beach nourishment). Beaches that provided very little recreation space in the past may now provide abundant space to all users of the beach.

Another attractive feature of groynes is their affordability. Typical 30 m long steel sheet pile groyne structures constructed on Lake Huron cost approximately $20,000 per structure (D. Peever, 1991). With a 60 m spacing between groynes, this represents a cost per unit length of $333/m. However, it is important to note that prefilling, if required, will significantly increase the cost of a groyne field. For example, with 30 m long groynes at 60 m spacing, each groyne cell would require approximately 2,400 m^3 of

granular fill (coarse sand desirable). Assuming a unit cost of $\$20/m^3$, this represents an additional cost of $48,000 per groyne cell, which results in a total cost per metre of $1,133/m, including the groyne and beach fill.

4.3.3 Disadvantages

When groynes are not properly implemented, severe erosion may occur on the downdrift side of the structure, as a result of the sand trapped on the updrift side. This problem has been common in the past, because most groynes have not been prefilled. Prefilling a groyne results in less erosion on the downdrift side, although some erosion may still occur in front of adjacent properties.

The effectiveness of groynes is also very dependent on the amount of alongshore sediment transport. If a sufficient sand supply is not present, the effectiveness of the shore protection can be greatly reduced. Thus, in areas with limited littoral drift, artificial beach nourishment may be required every few years in order to maintain the protective beaches.

Depending on the orientation of the shoreline relative to the net wave direction, a groyne system may provide inconsistent protection within each groyne cell due to the variation in beach width within each cell. Specifically, when the net wave direction is at a large angle to the shoreline, a relatively wide beach develops at the downdrift end of a groyne cell, while a relatively narrow beach develops at the updrift end. Clearly, the narrow beach will provide a lower level of protection than the wide beach.

Depending on their elevation, groynes may also be relatively ineffective during periods of high water, when the accreted beach may be mostly submerged. It is during periods of high water that most damage to property occurs, often requiring that other shore protection structures (revetments or seawalls) be in place to protect property during these periods. Higher (and possibly longer) groynes will retain an increased volume of beach fill and thus may provide additional protection to the shoreline, but require a sufficient supply of suitable beach building material, will result in an increased erosional stress on the downdrift shoreline, and may be aesthetically unacceptable.

4.3.4 Design Features

The design of a groyne system is relatively complex, and is perhaps closer to an art than a science. The following discussion provides a general overview of relevant design issues, and presents a typical design suitable for application along the SCRCA shoreline. This preliminary design is based as much on local experience as it is on technical references, as no comprehensive design manual for groynes is currently available. Additional information on the use of groynes for shore protection is presented in CIRIA (1990), which provides an excellent overview of the subject and design guidance for the preparation of detailed designs.

With respect to the level of protection provided by the groyne system described below, which utilizes groynes of similar design, dimensions and spacing to the existing groynes, it is considered that full protection to the shoreline and backshore will only be provided during periods of low to average water levels. Two alternative approaches are available to provide the increased level of protection required during periods of high water levels.

The first approach consists of constructing much larger groynes in order to retain a beach of sufficient width and elevation to provide the required level of protection. Specifically, the groyne elevations (particularly at the landward end) and lengths would be increased relative to the existing structures, and the spacing would also be increased. For example, it is estimated that full protection to the backshore from a 100 year design event (water level and waves) would require a groyne length of approximately double that of the existing groynes, and a landward elevation of at least 2 m higher. This approach is not recommended for a number of reasons, as follows:

- the increase in groyne length will result in increased interruption of natural alongshore sediment transport, and will thus increase the erosional stress on downdrift properties;

- full protection to the backshore is dependent on the development of a very large (wide and high) beach; the natural littoral drift is insufficient to supply the required quantity of material, and prefilling with suitable imported material will be very expensive due to the large quantity required;

- the application of a groyne field alone to provide full protection to the backshore under extreme conditions is unproven; the performance of this system is questionable.

The second, and recommended, alternative involves the provision of a secondary shore parallel structure (a revetment or seawall) to provide the additional protection required during periods of high water levels. A sloping revetment is recommended over a vertical retaining wall, as discussed in more detail later. The revetment would be located at the base of the bluff, and would be excavated into and partially buried by the beach, as illustrated schematically in Figure 4.1. Revetment design is discussed in detail in Section 4.4, where preliminary designs for design lives of 5, 25 and 100 years are presented. It might be possible to reduce the magnitude of these revetment structures when utilized in conjunction with a well designed groyne field due to the partial protection provided by the beach fronting the revetment. However, this would require a detailed assessment of the long term stability of the beach, particularly given the possibility that a severe storm occurring during a period of high water levels might result in the loss of the entire beach (Kamphuis, 1990). An assessment of beach stability is beyond the scope of the present study, and would require site specific investigations by a qualified coastal engineer. Lacking more detailed studies, it is thus recommended that the revetment designs presented in Section 4.4 be constructed to provide the additional level of protection over that which can be obtained from a groyne field when this additional level of protection is required.

4.3.4.1 Groyne Length and Spacing

The length and spacing of groynes in a groyne field is dependent on a number of factors, including the characteristics of the nearshore and beach sediments, the nearshore bathymetry (water depths) and the wave climate. Generally, groynes should extend across the "normal breaker zone" such that sediment collects between the groynes but the alongshore transport of finer material along the outer bars is not interrupted. Unfortunately, it is difficult to define the "normal breaker zone" on the Great Lakes due to the seasonal and long term fluctuations in water levels. However, it is reasonable to assume that the normal breaker zone extends out to the first sand bar. A review of aerial photographs along the SCRCA shoreline indicates that this feature is typically 10 to 20 m offshore from the waterline.

Typically, the ratio between groyne length and spacing varies from 1:1 to 1:4. Along the southeast shore of Lake Huron, a ratio of 1:2, with 30 m long groynes and 60 m spacing, has been reasonably successful (refer to Figure 4.1). For example, Letham, Jarvela & Robertson Ltd. (1983) studied the performance of groynes along a 5 km stretch of shoreline in Sarnia Township and noted the proven performance of 30 m groynes at 60 m spacing. They also concluded that spacing greater than 60 m was not effective with 30 m groynes, and suggested that the "ideal" design, would utilize 45 m long groynes at 180 m spacing (a 1:4 ratio) with "better beaches" (suggesting the requirement for artificial beach nourishment). They proposed a monitored trial project, with 15 m long rubblemound extensions to alternate groynes, abandonment of intermediate groynes, and artificial beach nourishment, in order to verify the performance of the proposed system. This trial project was never undertaken.

With respect to the orientation of the groynes, CIRIA (1990) notes that aligning the groynes directly into the direction of maximum storm waves will minimize structural damage to the groynes, while aligning the groynes slightly downdrift (in predominantly unidirectional littoral transport conditions only) provides the most effective control of littoral drift. In general, they suggest that groynes should be perpendicular to the shoreline. Finally, CIRIA (1990) notes that design details such as "T" and "Y" shaped groynes may assist beach development, but it does not provide specific recommendations concerning this detail. However, local experience shows that severe scour may occur at the end of "T" shaped groynes.

Based on the preceding discussion, it is recommended that any new groynes be constructed perpendicular to the shoreline with the proven 30 m length and 60 m spacing, as shown in Figure 4.1, unless a trial project demonstrates improved performance by an alternate layout.

4.3.4.2 Groyne Cross-Section

Ideally, a groyne is relatively low at its lakeward end and relatively high at its landward end. If the groyne is too high at the lakeward end, this will increase the potential for localized currents to erode material from adjacent to the structure. If the

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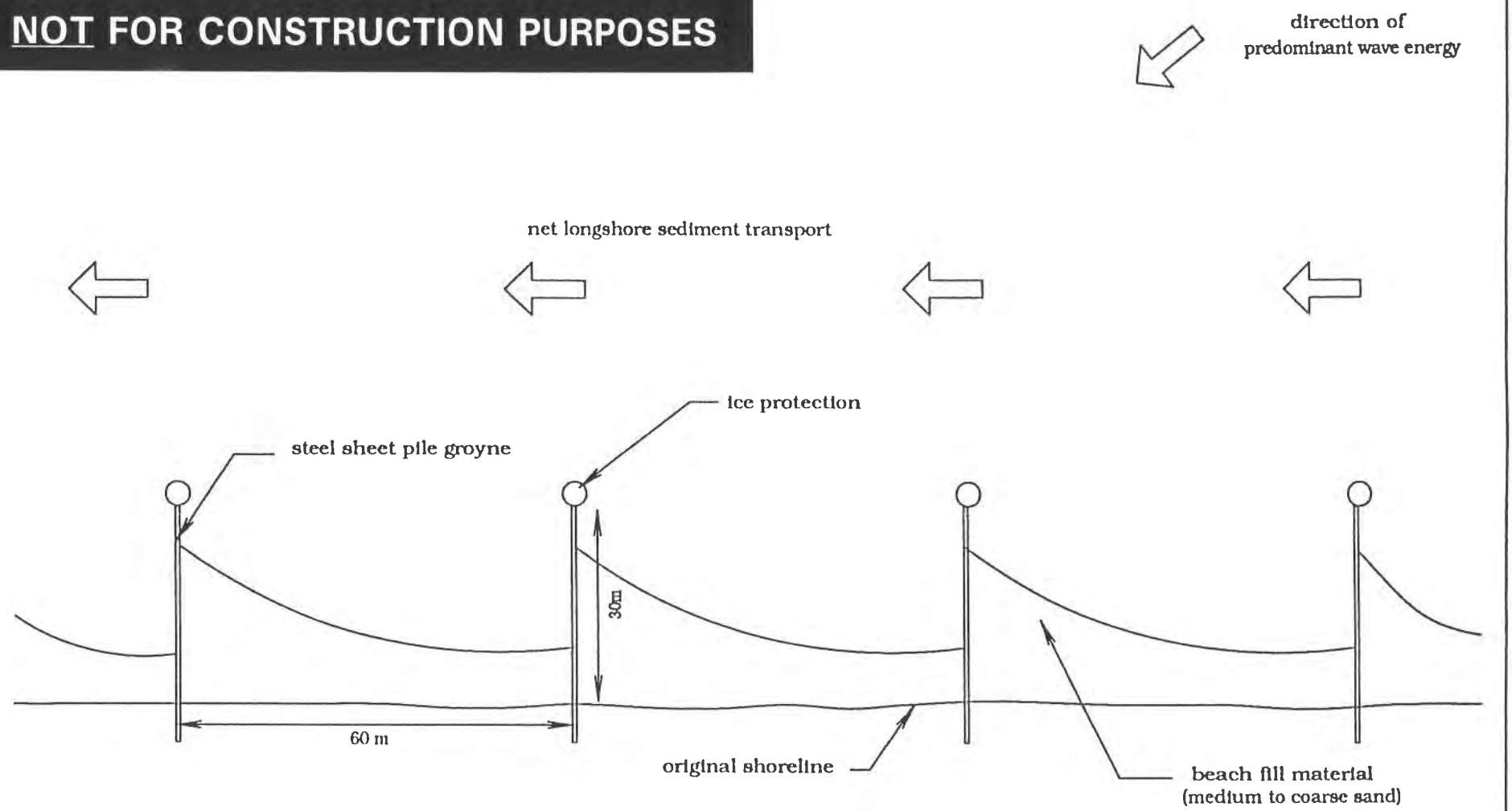


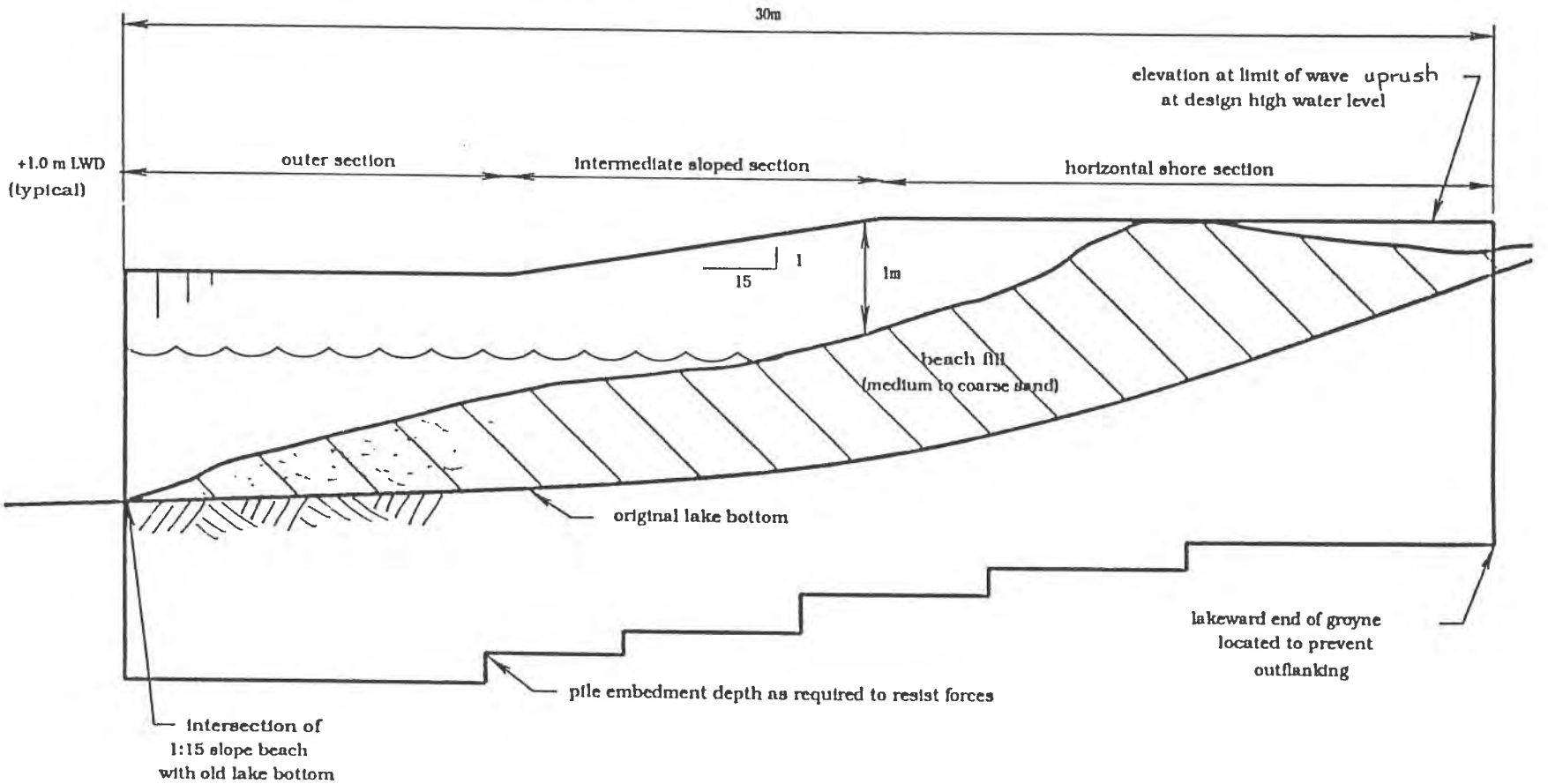
Baird & Associates	SCRCA SHORELINE MANAGEMENT PLAN PLAN VIEW OF TYPICAL GROYNE FIELD		
	Designed by: cda	Scale N.T.S.	Date: 15/11/91
	Drawn by: bkc		Figure 4.1

groyne is too low at the landward end, this will limit the depth of material that can accumulate updrift of the groyne.

As such, a groyne should be divided into three different sections: a horizontal shore section, a sloped intermediate section and a horizontal outer section (see Figure 4.2). The landward limit of the horizontal shore section is selected to prevent outflanking during periods of severe erosion. However, in areas where the backshore is erodible, such as the glacial till bluff along the SCRCA shoreline, it may be necessary to provide a shore parallel structure (seawall or revetment) along the shoreward end of the groynes to prevent outflanking of the groynes during a severe storm. The lakeward limit of the shore section is located at the top, or crest, of the proposed beach location following filling of the groyne cell. The elevation of this section is typically the limit of wave uprush at the design high water level, which normally corresponds to the crest of the storm berm on the beach. This elevation may be decreased to allow overtopping of sediment into the next cell, if desired.

The intermediate section slopes lakeward approximately parallel to the proposed beach face (a 1:15 beach slope is typical in this area), and ideally would be maintained at an elevation of approximately 0.5 to 1.0 m above the beach level (CIRIA, 1990, MNR, 1986). Given seasonal and long term fluctuations in the beach widths and profiles on the Great Lakes, satisfying this requirement would require groynes of adjustable height, such as H-piles with timber or concrete lagging. This type of adjustable groyne has been used elsewhere, but has not typically been used on the Great Lakes. The sloping section should extend to the point where the top elevation is approximately 0.5 m above the design monthly mean high water level (MNR, 1986). At this point, the horizontal outer section begins, and extends to the end of the proposed 30 m groyne.

Existing groynes along the SCRCA shoreline have typically been constructed to a constant elevation of +1.5 to +2.0 m LWD. This elevation is below the estimated storm wave runup level, even for design water levels with a return period as short as 5 years. Thus, it is likely that beach material is carried over the groynes from one cell to the next during storm conditions.



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Baird & Associates

SCRCA SHORELINE MANAGEMENT PLAN

CROSS-SECTION OF TYPICAL GROYNE

Designed by:	Scale	Date:
oda	N.T.S.	15/11/91
Drawn by: bkc		Figure 4.2

4.3.4.3 Construction

Numerous alternatives are available for groyne construction. In this area, timber groynes have given way to steel sheet pile groynes. Armour stone construction is more expensive and difficult in this area, due to limited availability of suitable quarried stone and difficult access to the shoreline for heavy construction equipment. Adjustable groynes, such as timber or concrete lagging placed between steel H beams, have not been utilized in this area.

Ideally, one would recommend an armour stone groyne with an impermeable core, due to the reduced lake bottom scour associated with such a design. However, given material and cost constraints in this area, it is clear that steel sheet pile groynes will remain the preferred alternative. A steel sheet pile groyne consists of a series of interlocking steel sheets that are driven through the beach (which must be free of large stones or bedrock) into the underlying till to a depth sufficient to resist the applied forces and accommodate beach and nearshore erosion. Proper alignment is provided by first driving pipe piles and attaching a waler beam to act as a guide for driving the sheet piles. A clean, finished surface is provided by placing a cap over the steel sheet piles. These components also provide additional strength to the groyne.

The forces that must be resisted by the groyne include: forces due to the difference in sand depth on either side of the structure; forces due to wave loading; forces due to unbalanced water pressures in saturated soils; and ice forces. In this area, the piles must typically be driven to a depth of at least twice the height of the pile above the lakebed in order to resist these forces. This results in pile lengths in the order of six metres (20 feet).

Typical damage suffered by steel sheet pile groynes in this area include wave and ice damage along the exposed outer section, and long term deterioration of the sheet piles caused by corrosion and abrasion. In addition, extreme differences in the height of beach on either side of the groynes have resulted in buckling and collapse of some groynes in this area, while severe storms have caused outflanking of the landward ends of the groynes. Finally, local scour/erosion has been noted at the lakeward end of some of the groynes.

In order to provide additional strength to the exposed outer end of the groynes, local experience (W. Robertson, 1991) suggests that pipe piles should be spaced at no more than 2 m over the outer 12 m length of the groyne, and that an extra waler beam should also be provided in this area. Additional reinforcement to resist ice crushing forces at the outer end of the groyne may be achieved through the use of one or more pipe piles driven at the end of the groyne; these piles could be filled with concrete for added strength.

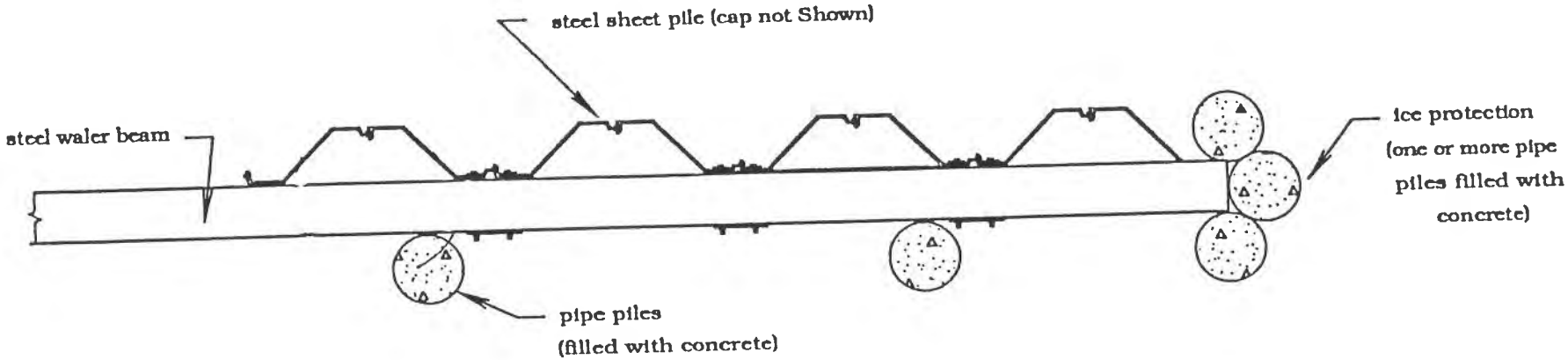
With respect to the long term deterioration of the sheet piles, the use of heavier (thicker) piles could provide a substantial sacrificial layer, and hence a longer design life. Coated steel piles would also be an option, although either alternative would increase the initial construction cost of the groyne.

Heavier piles could also be utilized to increase the resistance of the groyne to high soil loadings caused by different beach elevations at the landward end. Inclined buttress piles could also be considered.

Outflanking during extreme erosion events (severe storms at high water levels) can only be prevented by constructing some form of shore parallel protection at the landward end of the groynes. Specifically, an armour stone revetment or seawall could prevent outflanking of the groynes as well as erosion of the backshore under the extreme events during which groynes are relatively ineffective. An armour stone revetment is strongly recommended over a vertical seawall due to the increased energy dissipation and reduced wave reflection associated with the porous, sloping revetment structure.

Finally, local scour/erosion at the outer end of the groynes can be reduced by keeping the groyne elevation as low as possible along the outer section, and by placing quarried stone scour protection along the base of the groyne in this area.

Figure 4.3 shows the various components of a typical steel sheet pile groyne suitable for use in this area. As noted earlier, local experience indicates that a 30 m long groyne of this type typically costs in the order of $20,000. Detailed design of the groynes is beyond the scope of this study, and should be undertaken by a qualified coastal engineer on a site specific basis, within the overall framework of the Shoreline Management Plan. However, details of the different components typically used along this section of shoreline are summarized below:



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Baird & Associates

SCRCA SHORELINE MANAGEMENT PLAN

DESIGN DETAILS OF TYPICAL GROYNE

Designed by: oda	Scale N.T.S.	Date: 15/11/91
Drawn by: bko		Figure 4.3

- interlocking steel sheet piles
  - 8 to 10 gauge thickness
  - 3 m (10 ft) long at landward end, 5 m (16 ft) long at lakeward end
  - elevation typically +1.5 to +2.0 m LWD
- steel pipe piles
  - 150 to 200 mm (6 to 8") outside diameter
  - 6mm (1/4") wall thickness
  - typically 0.6 m (2 ft) longer than sheet piles

4.3.4.4 Artificial Beach Nourishment

Upon completion of the steel structure comprising the groynes, it is strongly recommended that the cells be filled, as closely as possible to the expected stable beach shape, with appropriate material. In general, this beach fill should consist of a clean, medium to coarse sand, and should be obtained from a sand and gravel pit, as opposed to excavation/dredging in the shore zone. This "pre-filling" must be done in order to prevent erosion on the downdrift side of the groyne field which would otherwise occur if the groyne cells were allowed to fill by interrupting the natural alongshore transport of sand. Typically, a 30 m groyne length with 60 m spacing would require in the order of 2400 m^3 of material per groin cell. Assuming a unit cost of \$20/m^3, this represents and additional cost of \$48,000 for each 60 m long beach cell.

Finally, with respect to existing groynes along this shoreline, owners would be well advised to "post-fill" their groyne cells with imported beach fill (clean, medium to coarse sand) in order to provide additional protection to their property, and to reduce the trapping of littoral material moving along the shoreline. Unfortunately, this may not be possible at all locations due to large water depths which may exist in the nearshore area, thus exposing the shoreline to relatively high wave energy and requiring an excessive quantity of beach fill material. In these cases, an armour stone revetment should be considered.

4.4 Armour Stone Revetments

4.4.1 Concept

Armour stone revetments are sloped shore parallel structures that rely on the mass of the armour stones to withstand the forces of the waves, and are built to prevent the direct attack of waves on the toe of a bluff or a sand dune. As waves impact the structure, energy is dissipated as the water moves over the rough, permeable sloped face of the structure, and through the voids between the armour stones. The land behind the structure is thus protected from the erosional stress that results from wave attack.

4.4.2 Advantages

Armour stone revetments have advantages over many other forms of shore protection, because they can be designed to provide full protection to the bluff under any conditions encountered on Lake Huron. The use of larger armour stones and/or a higher crest elevation will provide a stable structure which protects the backshore under more severe conditions.

Depending on the size of structure required, these structures may be reasonably cost effective, and require relatively limited annual maintenance. This type of structure can also be designed to accommodate the ongoing erosion of the lake bottom, thus providing long term protection to the backshore. However, this will have a significant impact on the capital construction cost, although annual maintenance costs will be reduced.

4.4.3 Disadvantages

Revetments, like any other shore protection structure, have a number of disadvantages that make them inappropriate for some conditions. Unlike groynes, revetments may severely limit access to the beach and water, and do nothing to increase the amount of recreation space. Beach or water access must often be provided by staircases or ramps located intermittently along the shoreline.

Another severe disadvantage with revetments is that the structure does not encourage beach development, and may in fact increase the rate of erosion in front of the structure. This results from wave energy that is reflected from the structure, which increases the erosional stress and causes scour in front of the structure. If the lake bottom erodes, higher waves may be able to reach the structure, further eroding the bottom and possibly undermining the structure.

Finally, armour stone revetments may be relatively expensive compared to other shore protection structures, depending on the exposure of the site, the selected design life of the structure, and the availability of suitable quarried stone material. In this area, there is no local quarry to supply large armour stone for shoreline protection projects (the closest suitable quarries are in Ingersoll and Amherstberg), so the material must be trucked a considerable distance, which results in higher costs. In addition, access to the shoreline for large construction equipment is limited and difficult over much of this area.

4.4.4 Design Features

Revetments built on the southeast shore of Lake Huron may use different sizes of armour stones, depending on the design life of the structure, and the value of the property being protected. For example, the revetment structures recently constructed adjacent to Old Lakeshore Road at the Bridgen Side Road in Brights Grove are protected by a single layer of 3 to 4 tonne armour stones (estimated weight). The design of these structures did not consider the future erosion of the nearshore lake bottom in front of the shoreline, which appears to be common practice along this shoreline.

The crest height chosen for a revetment structure will greatly affect its performance in high water and/or severe wave conditions. A higher structure is less prone to overtopping by waves, meaning that the area behind the structure is more protected. If excessive overtopping occurs, damage to the structure may result as the back of the structure is eroded, or damage to the adjoining property may result. Wave runup and overtopping levels on a sloping structure may be estimated using a number of approaches, as summarized by Atria (1991). Selecting the appropriate crest elevation is generally undertaken by comparing the cost of different crest heights with the associated risk. If the need for a high crest is established but is not desirable, other

alternatives may be possible, such as increasing the armour thickness or providing a splash berm or apron.

Revetments must be designed such that erosion directly in front of the structure, also known as scour, will not cause the structure to become unstable. Scour is eliminated as a potential failure mechanism through the use of "toe protection" or digging the structure deep enough into the sand to provide the necessary support after scour has occurred. The design of scour protection should be considered carefully and carried out by a qualified coastal engineer.

Another important consideration in the design of a revetment is the design of the transition layer(s) between the armour stone and the natural material or backfill over which the structure will be constructed. These layer(s), known as the filter layer(s), must ensure that any fine material beneath the structure is not washed out through the large voids that exist in the armour layer. This is done through the use of various layers of smaller rock and possibly a geotextile filter fabric.

As noted earlier, a revetment structure can be designed to accommodate the effects of erosion of the nearshore lake bottom. To illustrate the effect of this process on the magnitude and cost of revetment structures, preliminary designs have been prepared for revetments with design lives of 5, 25 and 100 years assuming an existing water depth of -0.5 m LWD. Nearshore downcutting was estimated assuming a nearshore slope of 1:20 and a bluff recession rate of 1 m/yr, as discussed in Section 3.2. Cross-sections for the three structures are shown in Figures 4.4, 4.5 and 4.6, while design details and cost estimates are summarized in Table 4.1.

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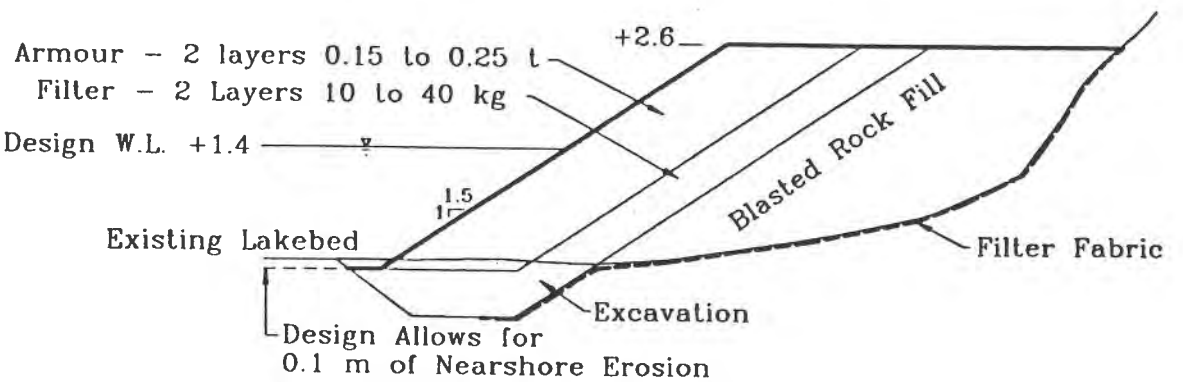

Figure 4.4

PRELIMINARY DESIGN FOR SHORELINE REVETMENT
(5 Year Design Life)

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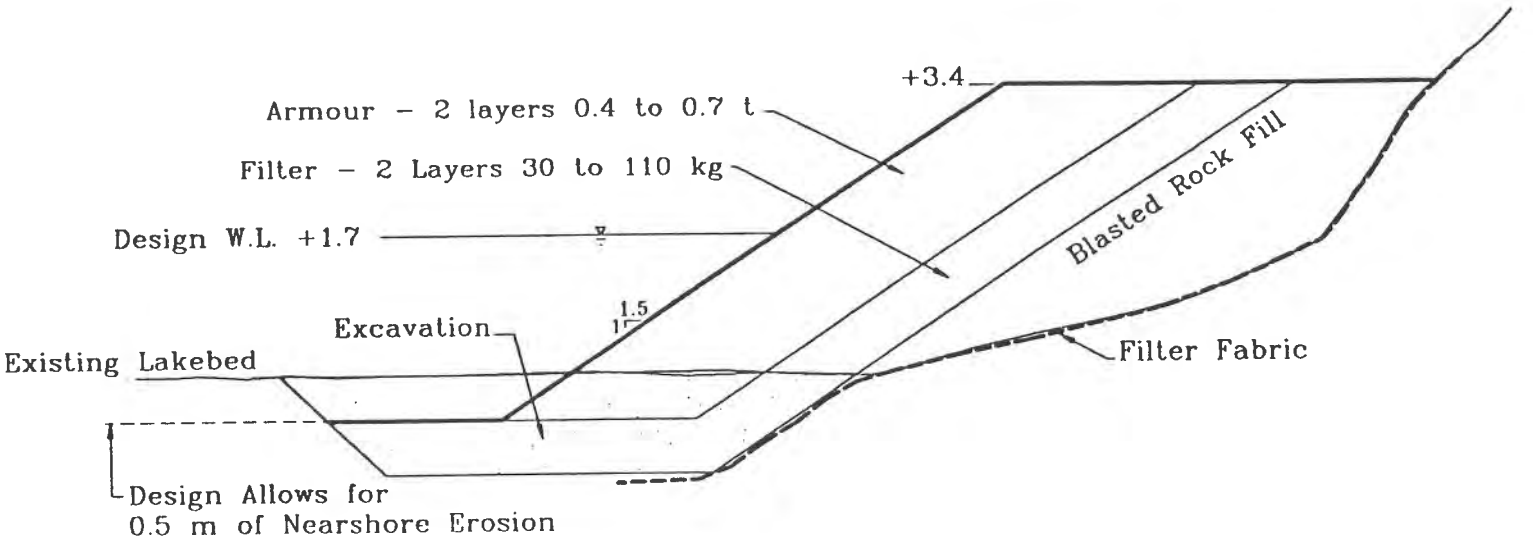

Figure 4.5

PRELIMINARY DESIGN FOR SHORELINE REVETMENT
(25 Year Design Life)

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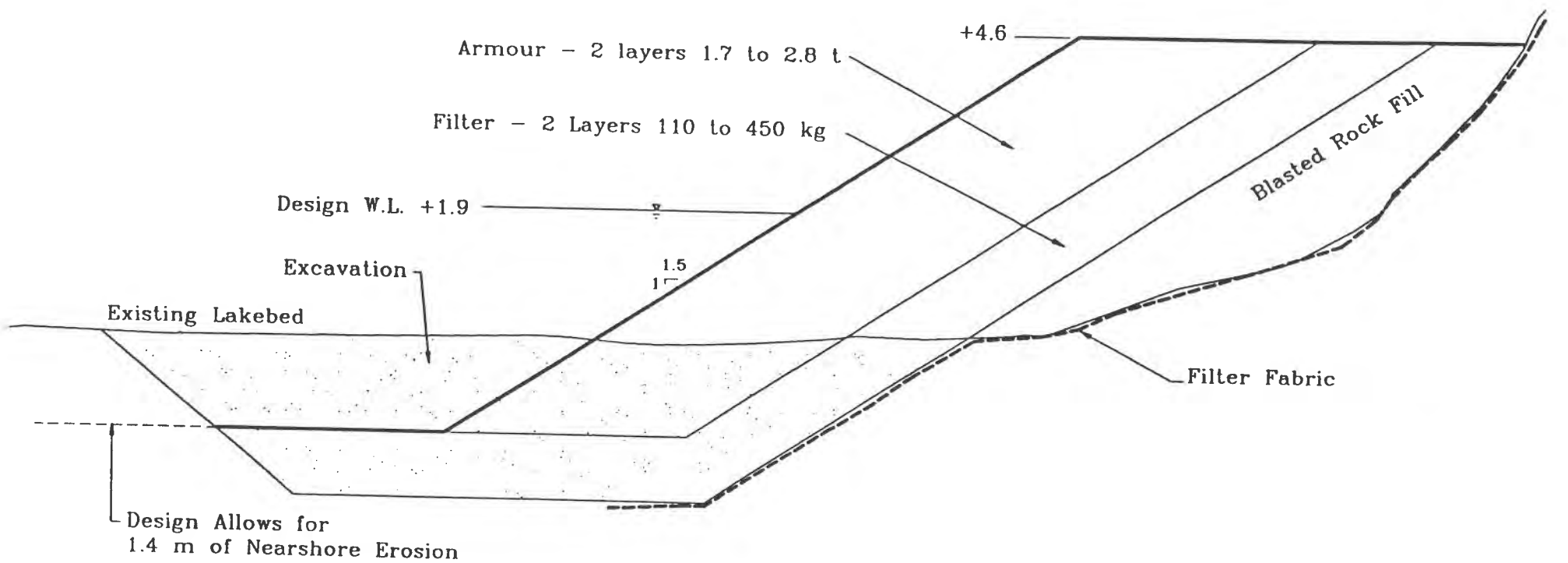


Figure 4.6

PRELIMINARY DESIGN FOR SHORELINE REVETMENT
(100 Year Design Life)

Table 4.1

Revetment Design Details and Cost Estimates
(typical nearshore profile, bluff recession rate = 1.0 metres/year)

	Design Life (years)		
	5	25	100
Existing Water Depth (m Chart Datum)	0.0	0.0	0.0
Design Water Level (m Chart Datum)	+1.4	+1.7	+1.9
Nearshore Erosion (m Chart Datum)	0.1	0.5	1.4
Total Design Depth (m)	1.5	2.2	3.3
Design Wave Height (m)	1.2	1.7	2.7
Armourstone Size (tonnes)	0.15 to 0.25	0.4 to 0.7	1.7 to 2.8
Crest Elevation (m Chart Datum)	+2.6	+3.4	+4.6
Toe Elevation (m Chart Datum)	-0.5	-1.1	-2.3
Estimated Cost per metres ($/m)	$700	$1,400	$3,700

Chart Datum = 175.8 metres IGLD 1955

These designs are based on standard procedures presented in the Shore Protection Manual (USACOE, 1977), and do not consider site specific details nor the availability of suitable quarried stone materials. The cost estimates, in 1991 dollars, are based on recent experience with similar structures in this area. Numerous design alternatives do exist which could lead to significant cost savings. However, these are beyond the scope of the present study, but should be considered by a qualified coastal engineer during final design development for shoreline protection at any specific site.

4.5 Retaining Walls

4.5.1 Concept

Retaining walls, also referred to as sea walls, are vertical, sloped, curved or stepped walls that function in a very similar manner to a revetment. They are typically made of steel or concrete, and are placed to protect the toe of a bluff or dune from wave attack.

Wave energy is primarily reflected back into the lake, as opposed to revetments where typically a larger percentage of the energy is dissipated on the structure.

4.5.2 Advantages

Most property owners consider seawalls to be more aesthetically pleasing than revetments for a number of reasons. Walls allow people to be closer to the water and/or beach than a stone slope. It is also easier to incorporate stairs or ramps for access to the water.

In some cases, walls may be cheaper than revetments or other forms of shore protection; however, site conditions may cause this to vary.

Walls are sometimes preferred over sloped revetments because they require less width, possibly making construction feasible in some areas with a steep shoreline. A sloped structure might require large amounts of earth moving compared to a wall.

4.5.3 Disadvantages

Walls are generally less stable than revetments and have a shorter life. Walls, due to their steep (often vertical), impermeable and generally smooth face cause more wave reflection, resulting in increased erosion in front of the structure and more problems with scour and undermining at the toe of the structure. Because of this, walls may fail catastrophically if proper design is not used. Sea walls also require higher crests than revetments if overtopping is to be prevented.

The cost of seawalls may also be greater than other types of shore protection structures, depending on the conditions that exist at the site, and the type of wall that is to be used. Some seawalls can be very complicated to build, requiring anchoring of the walls to prevent overturning or very deep penetration depths for pile structures.

4.5.4 Design Features

Based on the disadvantages noted above, in particular the possibility of increased nearshore erosion due to wave reflections, it is recommended that sloping armour stone revetments be constructed rather than vertical seawalls. However, recognizing that site constraints and material availability may limit the application of revetments, the following discussion describes typical features of a retaining wall design. Detailed design of these structures is beyond the scope of this report.

Retaining walls are extremely varied in their design, including sheet pile structures, H-piles with lagging (beams between the piles), poured concrete walls, precast wall sections or stone filled gabion baskets. Steel sheet pile walls are the most common type along this section of Lake Huron's shoreline.

The design procedure must take into account a number of factors, including various forces which will act on the wall, such as:

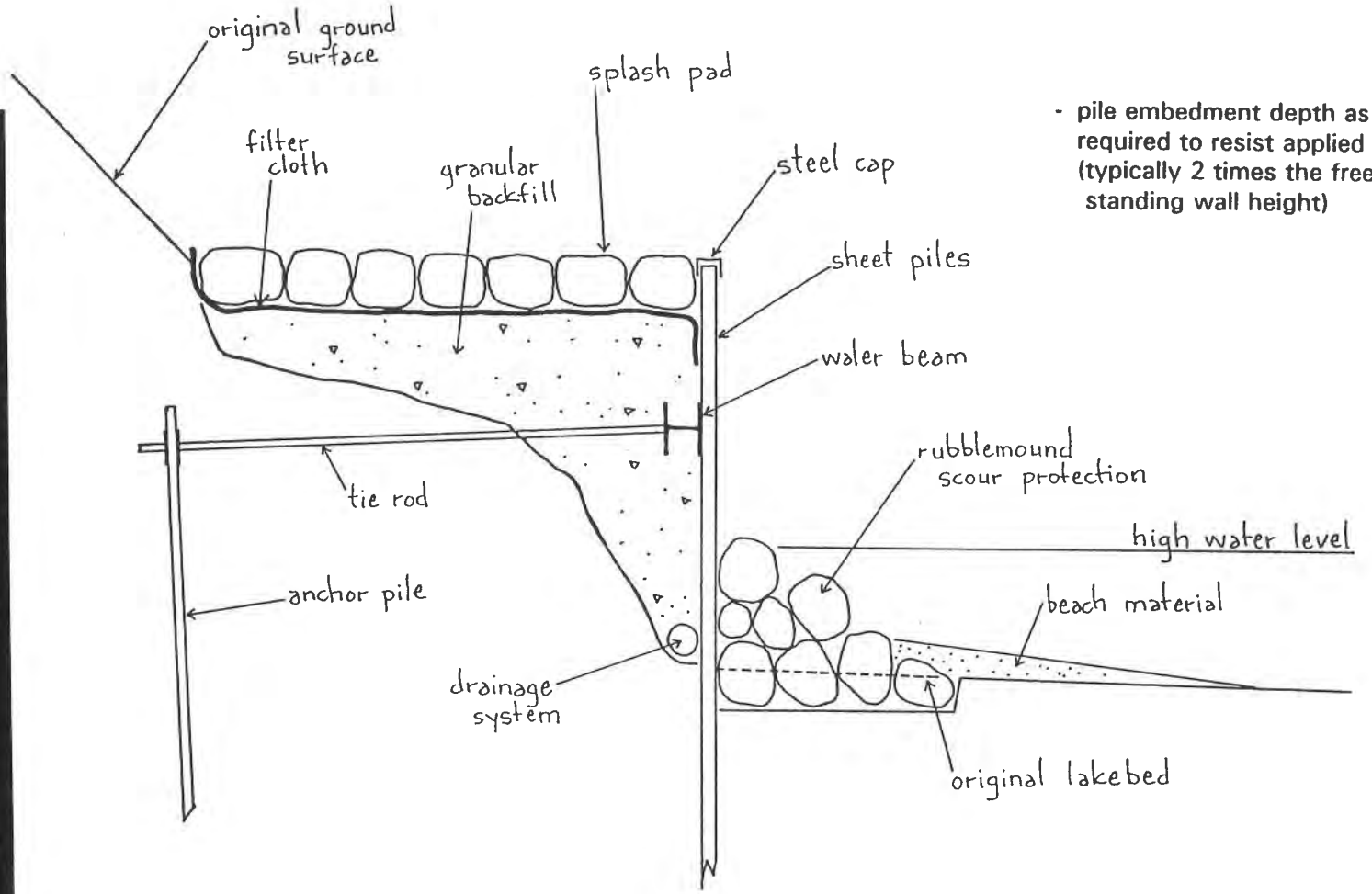
- soil loading caused by the weight of the retained backfill;
- hydrostatic forces, including that resulting from possible saturation of the soil behind the structure;
- wave forces, including hydrostatic and dynamic components; and
- ice forces.

The wall must be designed so that the various combinations of these forces do not cause the wall to tilt or the bottom to "kick out". This may require an anchoring system to hold the wall in place, and/or a significant embedment depth for the piles. Where an anchoring system is provided, pile embedment should normally extend to 1.5 to 2 times the free standing wall height above the anticipated scour depth, while the anchors should be located behind the wall by a distance of approximately twice the total structure height (free standing height plus penetration) (MNR, 1986). Alternatively, a "cantilevered" wall (no anchors) will require an increased pile embedment depth, typically 2 to 3 times the free standing wall height above the anticipated scour depth.

The required height of the wall is dependent on the design water level, the size of the waves at the site, and the amount of overtopping that is permissible. Maximum runup elevations can be estimated using the procedures summarized in Atria (1991). Construction of a wall to the maximum runup elevation will prevent significant overtopping, although splash and spray will be blown back behind the wall. However, in many cases, it may be desirable to allow some degree of overtopping in exchange for the lower cost and improved aesthetics that are associated with a lower crest elevation. The ability to make this trade-off will depend on the site conditions and the type of wall under consideration.

Where the nearshore lake bottom consists of an erodible material, scour at the base of the wall will be an important design consideration. Scour protection normally consists of quarried stone placed in a number of layers, so that the stone is not moved by the wave forces and the fine material below can not be drawn through the stone comprising the toe protection. This often requires the use of a filter zone of quarried stone layers and/or a geotextile filter fabric in conjunction with the toe protection. Alternatively, the structural design of the wall must consider the future loading conditions after scour has eroded the adjacent lake bed, which will necessitate more substantial construction (heavier components, greater pile embedment, etc.)

A cross-section of a typical steel sheet pile retaining wall is presented in Figure 4.7. Typical dimensions for retaining wall structures designed for 5, 25 and 100 year design lives are summarized in Table 4.2, making the same basic assumptions as stated earlier for revetments.



- pile embedment depth as required to resist applied forces (typically 2 times the free standing wall height)

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Figure 4.7

RETAINING WALL - TYPICAL CROSS-SECTION
Design Features

Table 4.2

Typical Dimensions for Retaining Walls [1]

	Design Life (years)		
	5	25	100
Existing Water Depth (m)	-0.5	-0.5	-0.5
Design Water Level (m LWD)	+1.5	+1.85	+2.0
Nearshore Erosion (m)	0.25	0.75	2.0
Total Design Depth (m)	2.25	3.1	4.5
Design Wave Height (m)	1.8	2.5	3.6
Top Elevation (m LWD)[2]	+4.3	+6.1	+8.1
Pile Embedment Depth (m LWD)[3]	10.1	14.7	21.2
Total Pile Length (m)	14.4	20.8	29.3

Note: 1 - design assumes suitable sour protection is provided at the base of the wall.

2 - "no overtopping" elevation calculated using ACES (1990).

3 - design assumes pile embedment depth of twice the free standing wall height is required.

0 LWD = 175.8 m IGLD

Clearly, a "no overtopping" design will generally be aesthetically unacceptable and financially unfeasible, even for the 5 year design condition, due to the high top elevation and excessive pile lengths required. Thus, the selection of a suitable top elevation will be a site specific decision dependent on construction costs and the allowable degree of wave overtopping under specified design conditions. Also, pile embedment depths will require an assessment of the geotechnical conditions at a

particular site, and should address the alternatives of anchoring systems versus increased embedment lengths.

Detailed design of these structures is beyond the scope of this report, and should be undertaken on a site specific basis by a qualified coastal engineer. Finally, it is once again emphasized that revetments are preferable to seawalls in this area due to the increased nearshore erosion associated with the latter.

A large percentage of the Sarnia-Clearwater shoreline, and a smaller percentage of the Plympton Township shoreline, is already protected by steel sheet pile seawalls, generally in conjunction with groyne fields. In some areas, the retaining wall is buried in sand trapped between the groynes and fronted by a wide beach, while in other areas, the retaining wall is directly exposed to wave action on the lake, with no beach and significant water depths in front of the structure. In either case, but particularly the latter, it would be desirable to place armour stone in front of the existing seawalls in order to minimize wave reflections and reduce the potential for scour at the toe of the structure. In addition, overtopping during severe storms and high water level periods would be reduced, due to the increased dissipation of wave energy on the structure.

4.6 Improvements to Existing Structures

Given the extent of existing shoreline protection within the jurisdiction of the SCRCA, and the ongoing problems associated with the existing system (maintenance/repair work, inadequate beaches, and insufficient protection during extreme storms), a number of approaches have been developed to improve the performance of this system. These approaches have been mentioned briefly in the earlier sections, and are summarized in the following discussion.

Artificial beach nourishment should be considered in this area, particularly where existing groynes may assist in stabilizing the beach. This approach would provide improved recreational beaches, as well as increased protection to the backshore area. The beach fill should consist of a medium to coarse sand ($D_{50} > 0.35$ mm); "Granular B" material would be suitable, and is readily available from quarries which supply the road construction industry. In conjunction with the beach nourishment program, it is suggested that groyne repair and maintenance works be coordinated to develop a

uniform system with 30 m long groynes at 60 m spacing. This may involve removal of selected groynes, and construction of new groynes in specific areas.

In areas where artificial beach nourishment is not feasible, for example where deep water exists immediately adjacent to a retaining wall, it is suggested that an armour stone revetment should be considered. Replacement of existing seawalls with armour stone revetments will reduce wave runup and overtopping onto the backshore, as well as reducing wave reflections and the associated erosional stress on the nearshore lake bottom. Revetment construction could proceed on a site by site basis as seawalls reached a specific level of deterioration. Revetment construction could utilize quarried stone or "clean" concrete rubble of suitable size and gradation.

Finally, in conjunction with the above approaches, it is recommended that "contaminated" construction rubble (contaminated referring to the presence of exposed steel components) which litters the shoreline in certain areas should be removed. This would eliminate a significant hazard to public safety, and in conjunction with a beach nourishment program, would improve the aesthetic, recreational and protection features of the shoreline.

5.0 BLUFF STABILIZATION

Even when erosion at the toe of a bluff is controlled by a shoreline protection structure, the top of the bluff will progressively retreat until the slope reaches a stable angle. Factors other than wave-induced toe erosion which affect bluff stability and the stable slope angle include the composition of the bluff, the presence of vegetation on the bluff face, and drainage conditions, including surface runoff and seepage. For example, gullies form as the result of a concentration of surface runoff, while seepage through the bluff weakens the soil and may result in slumping. Vegetation assists in stabilizing the bluff, by slowing runoff and holding soil particles in place, as well as by removing moisture from the soil.

The draft provincial policy statement (MNR, 1991) requires a stable slope allowance, or setback, of three times the bluff height in the absence of the site specific information. This allowance may be reduced if site specific investigations by a qualified geotechnical engineer indicate that a steeper slope will be stable in the long term.

Slope stabilization measures include regrading and revegetating the slope, and drainage systems to reduce surface runoff and seepage. However, bluff stabilization is not a useful method to protect property, unless the toe of the bluff is protected from the eroding forces of the lake. In cases where the toe is not prone to erosion, or has been properly protected, bluff stabilization may enhance the appearance of the property, as well as make the property more useful and less hazardous. Bluff stabilization without attention to the toe of the structure is, at best, a temporary measure, while attention to the toe of the bluff, without slope stabilization leaves part of the property useless and dangerous.

5.1 Regrading and Vegetating

All soils have an angle at which the loose grains will not roll or slide down the surface. Unstable bluffs are typically much steeper than this angle, resulting in the constant movement of soil down the slope after the individual particles or clumps of particles

become loose, especially when under the influence of other erosional stresses such as surface runoff and seepage. As enough of these small movements occur, larger areas often become unstable, resulting in larger collapses of the bluff.

Regrading the bluff to a flatter slope, and/or vegetating the bluff face will both help to prevent the smaller, and thus larger, collapses of the bluff. The slope should be regraded as close as possible to the stable slope angle, preferably from the toe of the slope back so as to cause the least possible disruption to the beach area. The angle to which the slope can be regraded may be dependent on existing or proposed development on the property, or the angle required for revegetation.

Vegetation is most easily done on a slope in the order of 1:3 (ratio of 1 vertical to 3 horizontal). Angles in the order of 1:1 are virtually impossible to vegetate properly, while 1:1.5 slopes are possible but steeper than ideal. Vegetating the bluff may be in the form of grass, ground cover, larger shrubs, trees or a combination of a number of these. Inspection of other naturally stable bluffs in the area may indicate the type of vegetation that stabilizes the slope well, and grows well in a similar environment. Additional information on the use of vegetation to assist in slope stabilization is presented in MNR (1986) and Great Lakes Basin Commission (undated).

5.2 Drainage

Drainage down the face of the bluff, resulting from surface runoff or seepage through the face of the bluff, may cause stability problems. Drainage problems may continue to cause slope instability even after toe protection or toe stabilization has been implemented. A drainage system which controls surface runoff and/or seepage will improve the stability of a bluff.

In areas where gullies are present and are causing erosion to the bluff, a diversion of surface water may be required, using methods such as a diversion berm above the gully and controlled discharge through a pipe or lined channel to the lake. If diversion is not possible (it may just relocate the problem) then a properly designed gully bed with stone or filter cloth may help to reduce the erosion problem.

In areas where seepage occurs through the bluff face, water should be collected at the surface, and/or drains should be installed in the bank to collect the water before it reaches the bluff face. The water should then be removed from the bluff face and discharged in a controlled manner (i.e. through a drainage pipe or lined channel) to the lake.

For surface runoff down the bluff face, horizontal channels may be placed at a number of elevations on the bank to channel the water to some sort of pipe or lined channel. This method would also be effective in removing water that had seeped to the bluff face. The number of horizontal channels that are required would depend on the slope of the bluff, the height of the bluff, the amount of vegetation, and the quantity of water to be removed.

6.0 IMPLEMENTATION

As noted earlier, a coordinated approach to shoreline protection, as opposed to an individual property by property approach, has a number of important advantages. For example, works planned and constructed along an extended section of shoreline will provide more effective protection than shorter individual works. In addition, overall construction (and design) costs are reduced through a coordinated approach. Finally, a coordinated effort may improve the opportunities for financing under various programs, and may also assist during the permit and approval phase.

For these reasons, a community or regional approach to shoreline protection is strongly recommended for the SCRCA shoreline. Specific details on acceptable forms of shoreline protection are discussed earlier in this report, while an overall discussion of the shoreline protection strategy for this area is discussed in the Shoreline Management Plan Strategy Document, under separate cover. The following sections describe specific activities required to implement the preliminary shore protection designs presented in this report.

6.1 Final Design

As noted earlier, the designs presented in this report are preliminary designs and should not be used for construction. The designs are based on limited information, and assume typical site and design conditions for the SCRCA shoreline. In addition, the cost estimates are approximate only, and have been based on recent experience with similar projects in southwestern Ontario.

The development of final designs should be undertaken by a qualified coastal engineer, and should be developed within the shoreline protection strategy described in the SMP Strategy Document. This will require a site visit by the engineer to assess site conditions, as well as desk studies to more accurately define the design conditions and to develop final design details, such as structure dimensions and material requirements and quantities. Depending on the site conditions, available information

and nature of the proposed project, more detailed field investigations, such as a bathymetric survey and/or a geotechnical investigation, may be required to support final design. Finally, the preparation of the final design must be accompanied by an impact assessment, as discussed in more detail in the following section. Costs associated with the preparation of a final design and impact assessment for an individual and typical shoreline protection project, with no major issues to be resolved, would likely be in the order of $3,000 (1991).

6.2 Permits and Approvals

It is recommended that the approval of the SCRCA be required prior to constructing anything within the shoreline hazard zone, as defined in the draft MNR policy. This includes any form of development (agricultural, seasonal or permanent residential, commercial, or industrial) as well as both shoreline protection and bluff stabilization works. A review and approval by other government agencies may also be advisable, as discussed later.

With respect to shoreline protection and bluff stabilization works, the final design should/must be carried out by a qualified coastal engineer, and the permit application must be accompanied by an impact assessment. This submission should address the following issues:

- site location,
- site description, including environmentally significant features,
- coastal conditions, design parameters, and littoral transport,
- description of the need for and details of the proposed works,
- design calculations,
- construction schedule,
- access and maintenance requirements,
- impact on littoral transport, the nearshore environment and adjacent properties,
- monitoring program.

Further, the impact assessment should demonstrate the following key points:

- the proposed works will not increase the long term shoreline recession rate at adjacent properties,

- the proposed works will not adversely affect adjacent structures,

- the proposed works will not adversely affect the environment.

Upon receipt of the impact assessment, the SCRCA would circulate it to all relevant approval agencies, as well as to updrift and downdrift property owners within 150 m of the property in question, in order to solicit their comments, concerns and recommendations. The SCRCA would then develop a coordinated response to the application, specifically allowing the work to proceed as proposed or with specified modifications, or not at all.

As noted earlier, approvals by other agencies may be required depending on the nature and magnitude of the proposed works. These are summarized in Table 6.1, reproduced from MNR (1986).

Table 6.1

Potential Approvals Required

Activity	Agency	Legislation	Who Needs to Apply	Description
• Construction on Crown Land	MNR	Public Lands Act	Municipalities and private landowners	- no structure or other matter may be on crown lands without approval.
• Construction in Lakes and Rivers	MNR	Lakes and Rivers Improvement Act	Municipalities and private landowners	- permit is required for construction of any structure in or along any stream, river lake.
Removing sand and gravel	MNR	The Beach Protection Act	Cons. Auths. municipalities and private landowners	- regulates the removal of sand and gravel from beaches and under the waters of any lake, river or stream. - intended to prevent and minimize erosion of beach property.
• Fill in Floodplain	Cons. Auth.	The Conservation Authorities Act	Municipalities and private landowners	- controls placement of fill in regulated floodplains.
• Construction in Floodplain	Cons. Auth.	The Conservation Authorities Act	Municipalities and private landowners	- controls construction in regulated floodplains to prevent loss of life or property.
• Construction in a Navigable Water	Transport Canada	Navigable Waters Protection Act	Province, Cons. Auth. municipalities, and private landowners.	- controls construction navigable waters. - exemptions are usually obtained for protection works.
Placement of materials in lakes and rivers	MOE	Water Resources Act	Cons. Auth., municipalities and private landowners	- no permit required prior to construction but MOE can stop work if they judge the work to adversely affect water quality.
Environmental Assessment (Class EA)	MOE	Environmental Assessment Act	Cons. Auth., MNR and municipalities	- environmental screening of projects dealing with shore protection.

Table 6.1 cont'd

Potential Approvals Required

Activity	Agency	Legislation	Who Needs to Apply	Description
Environmental Assessment (Individual EA)	MOE	Environmental Assessment Act	Cons. Auth., MNR and municipalities	- environmental impact assessment for projects of larger size (i.e. over $2 million in Dec. 1977 dollars) and of potential significant impact.
Construction over any public shore, bay, harbour, river or water	Municipality	Municipal Act	Private Landowners	- approval for construction over public shores and water, if municipality passes by-law.
Building Permit	Municipality	Municipal Act	Private Landowners	- required where retaining walls are constructed.

• Normal approvals required by individual Landowners

Of particular relevance is the Public Lands Act (MNR), which requires approvals for all works extending lakeward of the normal shoreline. The following is quoted from MNR's policy on water lots:

"9. Authorization for new or existing works which extend beyond the normal shoreline (e.g., groynes, off-shore breakwaters, beaches, sills, etc.) shall be subject to the alternative requirements listed below. This is because such works usually have a significant effect on shore processes - causing littoral drift for example - to the detriment of neighbouring landowners. Tenure for such works may issue only if:

(a) The applicant obtains and submits written concurrence from all landowners within 500 feet (150 m) along the shore.

or (b) the applicant provides, at his expense, an engineer's report and/or a biologist's report which indicates that the works will cause no adverse effects;

or (c) The District Manager Holds a hearing, to which the applicant and all potentially affected landowners are invited, and the hearing results in a favourable consensus;

or (d) The applicant, where a series of works would achieve the desired result with minimum adverse effects, organizes the neighbours to undertake simultaneous construction of the requisite number of shoreline works. (MNR would deal with the proposal as a "package" but tenure would be granted to the individual owners in front of whose property each work was being built.);

or (e) The municipality becomes involved and takes responsibility for co-ordinating the installation and control of protection works along a given stretch of shoreline. In such case, it would be advisable to have the municipality enter into a Beach Management Agreement with MNR.

10. Where an existing occupancy cannot be authorized because it fails to substantially comply with the requirements of this policy and the occupant refuses or neglects to take reasonable corrective action, or the occupant, being not entitled to "free use", refuses or neglects to take out authority, removal of the improvement or structure may be undertaken, in accordance with Policy & Procedure LM7.06.01, "Control of Unauthorized Improvements".

Removal with support of local municipality, should be considered where the improvement or structure:

(i) is located in Crown land in front of someone else's property and it is concluded that the normal use and activities of the other owner(s) are adversely affected;

(ii) is of a size substantially larger than that required for the current purpose of use;

(iii) has an adverse impact on the programs of this Ministry;

(iv) is in conflict with the current land use pattern of the area;

(v) is detrimental to the normal pursuits of other users of the waterway;

(vi) other valid reasons."

6.3 Financing

There are very few sources of funding for either private landowners or the municipality to complete shore protection projects. Private landowners can apply to the Shoreline Property Assistance Act (administered by the Ministry of Municipal Affairs and Housing and the local municipality) and the Local Improvement Act (administered by the local municipality), while the municipality can apply to the Parks Assistance Act and the Conservation Authorities Act, both administered by MNR.

6.4 Construction

Although construction can, in some cases, be undertaken by the landowner, in general it should be completed by a contractor with related experience in shoreline construction. Landowners would be well-advised to meet and discuss the project with several qualified contractors, and to obtain written quotes from each of them based on the final designs and specifications for the work. Prior to selecting a contractor, it would also be beneficial to investigate the financial capability of the contractor to complete the work, and to examine his past performance on similar projects, identified by a list of references provided by the contractor. Based on all of this information, the landowner can make an informed selection of the best contractor for the job. It is advisable that a formal, signed agreement be completed with the contractor prior to undertaking any construction.

Depending on the nature and magnitude of the project, it may also be advisable to provide on-site inspection of the work as it proceeds. This might involve part or full-time observation by the landowner, and/or specific site visits by a qualified engineer, preferably the project designer. Quality control during construction is an essential component of a successful project, and should not be overlooked. Construction which does not meet the project specifications may not achieve the level of performance

intended by the original design, and could result in costly damages and maintenance /repair requirements.

6.5 Monitoring and Maintenance

An essential component of any shoreline protection project is an on-going monitoring and maintenance program. A visual inspection of structures should be completed by a qualified individual on an annual basis, and following severe storms, such that potential problems can be identified and addressed before excessive and unrepairable damage occurs. In order to maintain the performance of the structure as per its original design intent, maintenance and repairs should be undertaken as soon as possible after a potential problem area is identified.

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APPENDIX A

Summary of Reaches in Littoral Cell #4

Kettle Point to St. Clair River
(from Reinders, 1989)

Reach: K. Kettle Point Lighthouse to Gustin Grove

Length: 9.5 km

Description:

Nearshore: Bedrock and stony till, very shallow with 2 m contour well offshore.

Shoreline: Boulder covered and marshy south of Kettle Point. Further to the south cobble beach.

Bluff: None

Sources of Sand:

Bluff: None

Lake Bottom: Negligible

Creeks & Rivers: 70 cubic metres/year

Gullies: None

Sand Losses: Negligible

Sand Transport: Essentially none. No supply of sand and very little wave energy reaches the shoreline.

Structures and Shore Protection: - 9% of shoreline protected.
- tip of Kettle Point protected by stone revetment

Shoreline Management Recommendations: -This shoreline could be developed with minimal consequence to the shoreline processes.
- Setbacks should be based on flooding considerations.
- Beach nourishment could be considered as alongshore transport of sand is very low.

References: Delcan (1987), MacLaren (1976)

Reach: L. Gustin Grove to Harris Point

Length: 12.2 km

Description:

Nearshore: In the north section, a shallow water shelf protects the shoreline. Further to the south, water depth increases.

Shoreline: Cobble beaches to north with sand to the south.

Bluff:
- Bluff erosion starts to the south as nearshore depths increase.
- Recession rate ranges from 0 - 0.55 m/year.

Sources of Sand:

Bluff: 8120 cubic metres/year

Lake Bottom: 3090 cubic metres/year

Creeks & Rivers: 210 cubic metres/year (Hickory Creek)

Gullies: 990 cubic metres/year

Sand Losses: Negligible

Sand Transport:
- North to south, controlled by supply and nearshore water depths. Transport at north end is zero.
- 12,490 cubic metres/year transported out of the reach to the south.

Structures and Shore Protection:
- 40% of shoreline protected.
- Cedar Bay Beach: 2 marinas; Cedar Point protects shoreline.
- Gustin Grove: most lakefront homeowners have protected with groynes, seawalls or both.

Shoreline Management Recommendations:
- In stable north section, setback based on flooding considerations, sustainable development can be considered.
- In south section, development or protection not recommended. Setbacks based on recession.

References: Delcan (1987), MacLaren (1976), MacLaren (1980)

Reach: M. Harris Point to Brights Grove

Length: 10.9 km

Description:

Nearshore: Relatively deep water except at Harris Point where a stony till shelf effects the shoreline.

Shoreline: Small, narrow beach

Bluff:
- Eroding, non-vegetated bluffs
- Recession rate ranges from 0 - 0.9 m/year

Sources of Sand:

Bluff:	1820 cubic metres/year
Lake Bottom:	2590 cubic metres/year
Creeks & Rivers:	290 cubic metres/year
Gullies:	190 cubic metres/year

Sand Losses: Negligible

Sand Transport:
- North to south, controlled by supply of sand. 12,490 cubic metres/year transported into reach from the north. 17,380 cubic metres/year transported out of reach to the south.

Structures and Shore Protection:
- 67% of shoreline protected.
- Jetty at mouth of Perch Creek extends 50 m into lake.
- Perch Creek to Errol: groynes and seawalls are present although little beach has accumulated except due to Perch Creek jetty.
- Errol Creek to Harris Point: where groynes exist they appear to have created beaches, although this could be a function of decreasing water levels.

Shoreline Management Recommendations:
- Erosion of bluff provides sand to shoreline to the south.
- Establish setbacks based on recession.
- Consider maintaining structures that appear to be effective (will need detailed study however).

References: Delcan (1987), Letham, Jarvela and Robertson Ltd. (1982), MacLaren (1976), Philpott (1982), Rukavina (1982)

Reach: N. Brights Grove to St. Clair River (Sarnia)

Length: 14.2 km

Description:

Nearshore: Erodible till

Shoreline: Fully protected

Bluff: Recession rate ranges from 0.1 to 0.3 m/year

Sources of Sand:

Bluff: None

Lake Bottom: 6480 cubic metres/year

Creeks & Rivers: 91 cubic metres/year

Gullies: None

Sand Losses: Negligible

Sand Transport: North to south, controlled by supply of sand. 17,380 cubic metres/year transported into the reach from the north. 23,940 cubic metres/year transported to St. Clair River.

Structures and Shore Protection: 100% of shoreline protected. Groynes exist along entire reach length. Seawalls and revetments are present except small sections where wide beaches exist.

Shoreline Management Recommendations:
- Further development can be considered, as shoreline structures have no apparent detrimental effect on adjacent shoreline.
- Setbacks based on flooding (noting larger short term fluctuation at the south end of Lake Huron).
- Consideration should be given to uniform shore protection for entire reach, if further development is considered (e.g. beach nourishment, revetment)

References: Delcan (1987), MacLaren (1976), MacLaren (1981), Rukavina (1982)

Drainage Act and Conservation Authorities Act Protocol (DART)
(A protocol for municipalities and CAs in drain maintenance and repair)
Completed Files

Municipal drain August – October 2016 activity report associated with the provincially approved guidance *"Drainage Act and Conservation Authorities Act Protocol (DART)"* approved by the Board April 18, 2013.*

SCRCA DART FILES ***2016 AUGUST***

FHR #	***Municipality***	***Geographic Township***	***Drain Name***	***Project Description***	***SCRs Issued***
2706	Chatham-Kent	Dover	Kime Pumpworks	Bottom only cleanout	1

SCRCA DART FILES ***2016 SEPTEMBER***

FHR #	***Municipality***	***Geographic Township***	***Drain name***	***Project Description***	***SCRs Issued***
2712	Southwest Middlesex	Mosa	King Drain & Armstrong Drain	Brush top of bank, brush bank slope, bottom only cleanout	3
2713	Southwest Middlesex	Mosa	McVicar Drain	Brush top of bank, brush bank slope, bottom only cleanout	3
2715	Warwick	Warwick	Auld-Redmond Drain	Brush top of bank, brush bank slope, bottom and 1 slope cleanout	3
2717	St. Clair	Moore	Phillips Drain	Brush bank slope, bottom only cleanout	2
2718	St. Clair	Moore	Wheeler Drain	Brush bank slope, bottom only cleanout	2

***Note**
The SCRs and the above report are prepared by Biology Section staff with ratification by Planning and Regulations Section/ Regulations Officer. Ontario Regulation 171/06 "Development, Interference with Wetlands & Alterations to Shorelines & Watercourses" applies, however the DART protocol is followed for streamlining purposes. SCR's – standard compliance requirements

SCRCA Planning Activity Summary for the month of September 2016 11.(v)

File Ref.	Municipality	Geographic Twp	Lot	Concession	Street
LL 2016	ADELAIDE-METCALFE	ADELAIDE	LOT 27	CON 2 SER	BUTTERY COURT
SEV B02/2016	ADELAIDE-METCALFE	ADELAIDE	LOT 18	CON 5 SER	PIKE ROAD
FI 2016	BROOKE-ALVINSTON	BROOKE	LOT 24	CON 14	HARDY CREEK ROAD
FI 2016	BROOKE-ALVINSTON	BROOKE	LOT 21	CON 8	ROKEBY LINE
FI 2016	BROOKE-ALVINSTON	BROOKE	LOT 19	CON 14	CHURCHILL LINE
FI 2016	BROOKE-ALVINSTON	BROOKE	LOT 10	CON 14	LITTLE IRELAND ROAD
SEV B73/2016	CHATHAM-KENT	DOVER	LOT 18	CON 12	ANGLER LINE
SEV B74/2016	CHATHAM-KENT	DOVER	LOT 30	CON BDW	BALDOON ROAD
SEV B72/2016	CHATHAM-KENT	CHATHAM	LOT 3	CON 11	UNION LINE
SEV B75/2016	CHATHAM-KENT	DOVER	LOT 20	CON 10	BEAR LINE ROAD
LL 2016	MIDDLESEX CENTRE	LOBO	LOT 3	CON 7	SINCLAIR DRIVE
LL 2016	MIDDLESEX CENTRE	LOBO	LOT 8	CON 8	COLDSTREAM ROAD
SUB 39T-MC0401	MIDDLESEX CENTRE	LONDON	LOT 25	CON 10	
FI 2016	PLYMPTON-WYOMING	PLYMPTON	LOT 15	CON 4	LONDON LINE
SEV B09 B20	PLYMPTON-WYOMING	PLYMPTON	LOT 8	CON 10	QUEEN STREET
ZBA 2016	SARNIA	SARNIA	BLOCK A	0	
FI 2016	SARNIA	SARNIA	LOT 15	CON 7	LONDON LINE
FI 2016	SOUTHWEST MIDDLESEX	EKFRID	LOT 4	CON 1	GLENDON DRIVE
GI 2016	ST. CLAIR	MOORE	LOT 19	CON 12	TECUMSEH ROAD
SEV B07/2016	ST. CLAIR	SOMBRA	LOT 17	CON 15	WAUBUNO ROAD
VAR A20/2016	ST. CLAIR	SOMBRA	LOT B	CON 13	ST. CLAIR PARKWAY
VAR A24/2016	ST. CLAIR	MOORE	LOT 24	CON 10	ROCKBY LINE
LL 2016	STRATHROY-CARADOC	CARADOC	LOT 18	CON 9	GLENGYLE DRIVE
SEV B26/16	STRATHROY-CARADOC	CARADOC	LOT 10	CON 3	GLENDON DRIVE
LL 2016	STRATHROY-CARADOC	CARADOC	LOT 7	CON 3	GLENDON DRIVE
FI 2016	WARWICK	WARWICK	LOT 6	CON 6 NER	ELARTON ROAD

SCRCA Planning Activity Summary for the month of October 2016

File Ref.	Municipality	Geographic Twp	Lot	Concession	Street
SEV B005/2016	DAWN-EUPHEMIA	DAWN	LOT 26	CON 13	NAYLER ROAD
FI 2016	LAMBTON SHORES	BOSANQUET	LOT 64	CON WEST OF LAKE	WOOD DRIVE
LL 2016	MIDDLESEX CENTRE	LOBO	LOT 6	CON 8	ILDERTON ROAD
FI 2016	OIL SPRINGS	ENNISKILLEN	LOT 18	CON 2	ORCHARDVIEW DRIVE
FI 2016	PLYMPTON-WYOMING	PLYMPTON	LOT 39	CON FRONT	BLUEPOINT DRIVE
SEV B21/22/16	PLYMPTON-WYOMING	PLYMPTON	LOT 22	CON FRONT	BONNIE DOONE ROAD
FI 2016	PLYMPTON-WYOMING	PLYMPTON	LOT 8	CON FRONT	DEVONSHIRE ROAD
SPA 2016	SARNIA	SARNIA	LOT 16	CON 8	MODELAND ROAD
VAR A47/2016	SARNIA	SARNIA	LOT 68	CON 9	ANDOVER LAND
FI 2016	SARNIA	SARNIA	LOT 37	CON 9	LAKESHORE ROAD
SEV B14,15,16	SARNIA	SARNIA	LOT 7	CON 9	ESTELLA STREET
VAR A26/16	ST. CLAIR	MOORE	LOT 53	CON FRONT	ST. CLAIR PARKWAY
VAR A27/16	ST. CLAIR	SOMBRA	LOT 17	CON 15	WAUBUNO ROAD
SEV B08/16	ST. CLAIR	SOMBRA	LOT 3	CON 8	WARD LINE
SEV B09/2016	ST. CLAIR	SOMBRA	LOT E	CON 8	ST. CLAIR PARKWAY

VAR A29/16	ST. CLAIR	SOMBRA	LOT E	CON 7	ST. CLAIR PARKWAY
FI 2016	STRATHROY-CARADOC	CARADOC	LOT 1	CON 1	OLDE DRIVE
FI 2016	STRATHROY-CARADOC	ADELAIDE	LOT 22	CON 5 SER	METCALFE STREET WEST
FI 2016	WARWICK	WARWICK	LOT 15	CON 7 NER	TOWNSEND LINE

File Reference Codes:

CZ - Comprehensive Zoning	SEV - Severances	GI - General Inquiry	FI – Regulations Inquiry
ZBA - Minor Zoning Bylaws and Amendments	VAR - Variances	LL - Legal Inquiries/Letters	NM – Nutrient Management
OP (A)-Official Plan (Amendments)	EA/PLEA-Environmental Assessments	SP-Site Plan	PTTW- Permit to Take Water
TC-Tree Cutting	SUB-Subdivision	DAR-Development Assessment Review	SPA-Site Plan Approval

Meetings

September

Sept 8 – GIS Software Enterprise Licencing renewal discussion/webinar – C.Durand

Sept 14 – Binational Public Advisory Council (BPAC) Meeting, Port Huron, MI – D. Strang, A. McIntyre

Sept 20 – Canadian Remedial Action Plan (RAP) Implementation Committee (CRIC) Meeting, Walpole Island, ON – D. Strang, A. McIntyre

Sept 21 – CRIC Fish and Wildlife Habitat and Populations Subcommittee Meeting, Strathroy, ON – D. Strang, E. Carroll

Sept 22 – Buckland Shoreline Property Site Visit – P. Hayman, M. Deisley, C. Durand, E. Ogden

Sept 22 – Meeting at St. Clair Township regarding Durco Proposed Plan of Subdivision – P. Hayman, E. Ogden

Sept 26 – Timberwalk Subdivision habitat creation site inspection, Ilderton – S. Hodgkiss

Sept 30 – Meeting with North Kent Wind Farm – D.C., G.S., M.D.

October

Oct 4 – Fawn Island Violation Site Visit – D. Cundick, E. Ogden

Oct 4 – North Kent Wind Farm Culverts Countryview Golf Course– M.Deisley, G. Wilcox

Oct 5 – Meeting at Middlesex Centre Re: Fire Hall – D.C., G.S.

Oct 6 – OPPI conference in Hamilton – P. Hayman

Oct 7 – Planning Ecologist meeting, Credit Valley Conservation – S. Hodgkiss

Oct 13 – Training New Staff at Maitland Valley Conservation Authority – E. Ogden

Oct 17 – ABCA Shoreline Steering committee mtg – P. Hayman

Oct 21 – Ponderosa Campground, Lambton Shores, site visit – D. Cundick, S. Hodgkiss

Oct 25 – 4058 Oil Springs Road, Enniskillen Site Visit – D. Cundick, S. Hodgkiss, E. Ogden

Oct 27 – Ontario Municipal Board Review Town Hall Meeting, London – E. Ogden

Oct 28 – Hydrog mtg re NW Berger and Modeland gas station – P. Hayman and L. Nicks

Staff Report *11. (vi)*

To: Board of Directors
Date: October 26, 2016
From: Donna Strang, Remedial Action Plan (RAP) Coordinator
Subject: St. Clair River Area of Concern (AOC)

Beneficial Use Impairment (BUI) Update:

Restrictions on Dredging Activities BUI:
The "Restrictions on Dredging Activities" BUI status assessment that recommends re-designation from "Impaired" to "Not Impaired" was presented to the Binational Public Advisory Council (BPAC) on March 30, 2016. Council members reviewed the report and provided questions and recommended revisions.

On September 14, 2016, BPAC voted in favour of approving the re-designation recommendation. There was one opposing vote. Next steps will include review by the Four Agency Managers Work Group consisting of representatives from Environment and Climate Change Canada (ECCC), the Ontario Ministry of the Environment and Climate Change (OMOECC), United States Environmental Protection Agency (USEPA) and the Michigan Department of Environmental Quality (MDEQ).

Beach Closings BUI and Bird or Animal Deformities or Reproductive Problems BUI:
Both the "Beach Closings" and "Bird or Animal Deformities or Reproductive Problems" BUIs received approval by the Canadian Remedial Action Plan (RAP) Implementation Committee (CRIC) for re-designation to "Not Impaired". Consultation with Walpole Island and Aamjiwnaang First Nations is on-going.

Restrictions on Drinking Water Consumption or Taste and Odour Problems BUI:
Four open houses were held to solicit feedback on the draft "Restrictions on Drinking Water Consumption or Taste and Odour Problems" BUI discussion paper. The purpose of the paper was to initiate a discussion on the status of this BUI as it is anticipated that its re-designation may not be received positively by the local community. The comments and feedback received will be summarized and presented to the CRIC who will determine what steps are required to move forward with the re-designation.

Early comments received by the Wallaceburg Advisory Council for a Cleaner Habitat (WATCH) on a draft of the "Restrictions on Drinking Water or Taste and Odour Problems" discussion paper prompted CRIC to circulate a voluntary survey to local industries. The survey asks for information regarding spill prevention initiatives implemented by local industries that go above and beyond their regulatory requirements. Distribution of the survey was facilitated through the Sarnia Lambton Environmental Association (SLEA).

Recent and Future Meetings:

Canadian Remedial Action Plan Implementation Committee (CRIC):

- September 20, 2016 - Walpole Island First Nation
- December 1, 2016 - Sarnia, Ontario

Binational Public Advisory Council (BPAC):

- September 14 - Port Huron, Michigan
- November 16, 2016 - Sarnia, Ontario

Fish and Wildlife Habitat and Population Subcommittee

- September 21, 2016 - Strathroy, Ontario

Presentations and Events:

Presentations were delivered and/or St. Clair River AOC information was displayed at recent meetings and events including:

- St. Clair Region Conservation Authority Bus Tour – September 23, 2016
- American BUI Removal Celebration Event, Marysville, Michigan – September 7, 2016
- Michigan State University Environmental Journalism Class Presentation at Guthrie Park – September 19, 2016

BPAC Celebration Event *– On September 7, 2016, over 70 people gathered at the Marysville, Michigan Golf Course to celebrate the removal of the "Beach Closings" and "Degradation of Benthos" BUIs on the American side of the St. Clair River AOC. Speakers from numerous government agencies and community groups addressed the crowd and awards to local stewards were presented. Tours of local habitat projects were provided to highlight the completion of all management actions required for the removal of the "Loss of Fish and Wildlife Habitat" BUI.*

ST. CLAIR REGION CONSERVATION AUTHORITY
Statement of Operations
AS AT September 30, 2016

	2016 Budget	2016	2015 Audit
Revenue			
Government Grants			
Section 39	310,000.00	310,000.00	310,003.00
Other	397,224.00	449,638.12	1,437,769.00
Municipal levies			
General	701,455.00	701,454.00	701,455.00
Other	329,020.00	195,130.00	572,090.00
Other Revenue			
Contributions	492,350.00	304,794.83	493,971.00
Miscellaneous	2,415,892.00	1,727,703.90	916,883.00
Interest	35,000.00	18,399.05	70,261.00
Conservation areas (Excluding Municipal Levy)	999,200.00	1,124,705.18	1,112,454.00
Transfers from reserves	-		0.00
Gain(loss) on disposal of assets			
General	-		
Unrealized gain (loss) on held-for-trading investments	-	-	- 8,215.00
Realized gain (loss) on held for trading investments		-	-
	5,680,141.00	4,831,825.08	5,606,671.00
Expenditures			
Administration, Schedule 1	666,760.00	508,531.97	529,656.00
Capital development, Schedule 1	544,358.00	157,922.95	1,402,232.00
Operating, Schedule 2	2,439,244.00	1,808,088.20	2,371,917.00
Property management, Schedule 2	255,500.00	164,197.32	242,949.00
Conservation area maintenance, Schedule 3	1,134,320.00	895,667.14	1,113,076.00
	5,040,182.00	3,534,407.58	5,659,830.00
Excess (deficiency) of revenues over expenditures before adjustments		**1,297,417.50**	**- 53,159.00**
Adjustments for Tangible Capital Assets			
Acquisition of tangible capital assets		-	213,075.00
Amortization of tangible capital assets		-	- 554,161.00
Gain/(loss) on sale of tangible capital assets		-	22,922.00
Proceeds on sale of tangible capital assets		-	- 34,798.00
	-	**-**	**- 352,962.00**
Excess (deficiency) of revenues over expenditures before adjustments	-	1,297,417.50	- 406,121.00

ST. CLAIR REGION CONSERVATION AUTHORITY
Statement of Financial Position
AS AT September 30, 2016

	GL 2016	Audit 2015
Financial Assets		
Cash and cash equivalents	3,334,293.46	3,601,489.00
Investments (note	2,083,118.71	1,957,456.00
Accounts receivable	334,763.86	344,944.00
Prepaid Expenses	20,872.61	10,019.00
Long-term investments	42,277.00	42,277.00
	5,815,325.64	5,956,185.00
Restricted Assets (Note)		
Restricted Shares	-	-
Foresty	11,742.19	11,742.00
RLSN	-	-
Kent	-	-
MSN	-	-
Rondeau	-	
Downsizing	-	
Cash and cash equivalents	11,742.19	11,742.00
Accounts receivable - Stewardship Programs	-	
	11,742.19	11,742.00
Total Financial Assets	5,827,067.83	5,967,927.00
Financial Liabilities		
Accounts payable and accrued liabilities	35,135.91	162,575.00
Accounts payable and accrued liabilities - Stewardship Programs	-	- 0.00
Deferred revenue	1,371,990.92	1,385,411.00
Due to Stewardship Programs (Note & Statement)	-	-
Total Financial Liabilities	1,407,126.83	1,547,986.00
Net Financial Assets	4,419,941.00	4,419,941.00
Non-Financial Assets		
Tangible Capital Assets, net of accumulated amortization (Notes & Schedule)	64,655,697.11	19,212,695.00
Net Assets	69,075,638.11	23,632,636.00
Conservation Authority Position		
Reserves and reserve funds (Statement 2 & 3)	4,419,941.00	4,419,941.00
Net Tangible Capital Assets	64,655,697.11	19,212,695.00
Current Year Depreciation	-	
Total Conservation Authority Position	69,075,638.11	23,632,636.00

Prepared By: Tracy Prince
October 19, 2016

ST CLAIR REGION CONSERVATION AUTHORITY
Statement of Revenue and Expenditure
For the Nine Months Ended 30/09/2016

	Actual To Date			Annual Budget		Variance from Budget	
	Revenue	Expenditures	Surplus(Deficit)	Revenue	Expenditures	Revenue	Expenditures
Flood Control & Erosion Control	$683,072	$398,048	$285,024	$671,732	$671,732	$11,340	($273,684)
Capital Projects/WECI	$192,632	$23,879	$168,753	$171,100	$171,100	$21,532	($147,221)
Conservation Area's Capital Development	$139,435	$93,200	$46,235	$104,000	$104,000	$35,435	($10,800)
IT Capital	$14,508	$2,616	$11,892	$19,200	$19,200	($4,692)	($16,584)
Equipment	$65,150	$26,390	$38,760	$72,000	$72,000	($6,850)	($45,610)
Planning & Regulations	$289,561	$330,631	($41,071)	$448,410	$448,410	($158,849)	($117,779)
Technical Studies	$360,363	$149,006	$211,357	$262,623	$262,623	$97,740	($113,617)
Recreation	$1,225,592	$895,667	$329,925	$1,163,620	$1,163,620	$61,972	($267,953)
Property Management	$164,936	$164,197	$739	$285,500	$285,500	($120,564)	($121,303)
Education and Communication	$98,815	$124,763	($25,948)	$211,265	$211,265	($112,450)	($86,502)
Source Water Protection	$171,358	$128,327	$43,031	$175,000	$175,000	($3,642)	($46,673)
Conservation Services/Healthy Watersheds	$762,181	$562,783	$199,398	$583,650	$583,650	$178,531	($20,867)
Administration/AOC Management	$664,222	$634,899	$29,323	$1,173,063	$1,173,063	($508,841)	($538,164)
	$4,831,825	**$3,534,407**	**$1,297,418**	**$5,341,163**	**$5,341,163**	**($509,338)**	**($1,806,756)**

Notes:

1. Municipal matching, non-matching, 3-D Special and Recreation levies totaling $746,455 have been invoiced and are recorded in the actual revenue reported above. See General Levy Report for amounts outstanding.
2. The significant variances from budget to actual is reflective of the nature/timing and uniqueness of the particular projects. The variances will reduce and disappear as the year progresses.

ST. CLAIR REGION CONSERVATION AUTHORITY **12.(ii)**

DISBURSEMENTS FROM Sept and Oct 2016 **Sarah Kellestine**

CHQ. #	DATE	VENDOR	DESCRIPTION		AMOUNT
18250	9/1/2016	WELLMARK INTERNATIONAL LBX 910	Larvicide	$	14,020.59
18251	9/7/2016	Snary, Emily	Payroll	$	162.05
18252	9/1/2016	BF ENVIRONMENTAL CONSULTANTS	Wetland Construction - Mark Eyre	$	15,224.90
18253	9/1/2016	BUFFETT, TAYLOR & ASSOCIATES I	Group Benefits	$	11,893.94
18254	9/1/2016	ONTARIO MINISTER OF FINANCE	Employer Health Tax	$	4,330.91
18255	9/6/2016	Acorn Tree Service	Trees	$	5,565.25
18256	9/6/2016	Badder Bus Operations Limited - Wabash	Bus Tour	$	536.75
18257	9/6/2016	Joe Breakey	Uniform	$	243.65
18258	9/6/2016	BUDDSTEEL ARCHITECH. PRODUCTS	Door - AWC	$	519.24
18259	9/6/2016	CENTRAL SANITATION	Portable Toilets	$	1,197.80
18260	9/6/2016	STEPHEN CLARK	Employee Expenses	$	77.69
18261	9/6/2016	COR'S MOTORS LTD.	Vehicle Repair	$	48.86
18262	9/6/2016	DELTA POWER EQUIPMENT	Supplies	$	30.25
18263	9/6/2016	Delta Power Equipment Watford Division	Supplies	$	66.01
18264	9/6/2016	DOWLER KARN PROPANE	Fuel	$	382.32
18265	9/6/2016	Drumm, Nicole	Payroll	$	40.38
18266	9/6/2016	ENVIRON INTERNATIONAL CORP.	Consutant - AOC	$	2,862.35
18267	9/6/2016	FOREST AGRI SERVICES LTD.	Pool Supplies	$	99.98
18268	9/6/2016	FRAMPTON MAILING SYSTEMS	Mailing	$	214.70
18269	9/6/2016	Golder Associates	Consultant - Water Resources	$	916.50
18270	9/6/2016	KELLY JOHNSON	Employee Expenses	$	186.80
18271	9/6/2016	KLEEFMAN CLEANING SERVICES	Office Cleaning	$	543.53
18272	9/6/2016	KNIGHTHUNTER.COM	Advertising	$	63.27
18273	9/6/2016	KYIS EMBROIDERY	Uniform	$	27.12
18274	9/6/2016	LAKESIDE GRAIN & FEED LTD.	Round Up	$	301.72
18275	9/6/2016	L.A. POOL & SPA	Pool Supplies	$	111.18
18276	9/6/2016	Marsh Canada Limited	Insurance	$	186.00
18277	9/6/2016	Laskey's Services 719329 ONTARIO LIMITED	Pool Supplies	$	63.40
18278	9/6/2016	PUROLATOR COURIER	Postage	$	16.51
18279	9/6/2016	GIRISH SANKAR	Employee Expenses	$	213.40
18280	9/6/2016	JEFF SHARP	Employee Expenses	$	79.66
18281	9/6/2016	Shannon Vending Limited	Meeting Expense	$	109.90
18282	9/6/2016	STRATHROY WELDING AND REPAIRS	Supplies	$	325.44

18283	9/6/2016	Strathroy & District Chamber o	Membership Fee	$	209.05
18284	9/6/2016	STRATHROY HOME HARDWARE BUILDI	Supplies	$	139.64
18285	9/6/2016	THREE MAPLES VARIETY	Fuel	$	787.03
18286	9/6/2016	MIKE TIZZARD	Employee Expenses	$	219.62
18287	9/6/2016	TOWNSHIP OF ST. CLAIR	Drain Maintenance and Water	$	171.29
18288	9/6/2016	JESSICA VAN ZWOL	Employee Expenses	$	209.95
18289	9/6/2016	WARWICK AUTO SERVICE	Vehicle Repair	$	99.44
18290	9/6/2016	WARWICK GAS & VARIETY	Fuel	$	720.11
18291	9/6/2016	WASTE MANAGEMENT OF CANADA COR	Garbage Collection	$	2,597.90
18292	9/6/2016	WATFORD HOME HARDWARE BUILDING	Supplies	$	383.93
18293	9/6/2016	WOODWARDS SERVICE CENTRE	Supplies	$	156.90
18294	9/6/2016	Wright, Pamela	Payroll	$	59.74
18295	9/16/2016	21 SHELL & VARIETY	Fuel	$	306.00
18296	9/16/2016	1841792 ONT. INC., BILL BRON E	Electrical Work	$	147.09
18297	9/16/2016	Bill Bouwma general Construction	Repair of waterline WWK	$	237.30
18298	9/16/2016	BUFFETT, TAYLOR & ASSOCIATES I	Group Benefits	$	11,907.46
18299	9/16/2016	Canadian Linen & Uniform	Mats	$	57.02
18300	9/16/2016	CENTRAL SANITATION	Portable Toilets	$	565.00
18301	9/16/2016	DOWLER KARN PROPANE	Fuel	$	222.23
18302	9/16/2016	DUN-RITE LANDSCAPING INC.	Lawn Maintenance	$	2,977.55
18303	9/16/2016	FOREST AGRI SERVICES LTD.	Pool Supplies	$	362.43
18304	9/16/2016	FOREST CITY BUSINESS EQUIPMENT	Photocopier Rental	$	1,963.99
18306	9/16/2016	JEG'S	Vehicle Repair	$	70.29
18307	9/16/2016	Linda Johnson	Catering - AOC	$	175.00
18308	9/16/2016	Kern Water	Ice	$	1,103.75
18309	9/16/2016	LANDSTRA CATERING	Meeting Expense	$	792.63
18310	9/16/2016	L.A. POOL & SPA	Pool Supplies	$	298.66
18311	9/16/2016	LOBLAW COMPANIES LIMITED	Meeting Expense	$	41.50
18312	9/16/2016	Heather Long	Employee Expenses	$	217.65
18313	9/16/2016	MOFFATT & POWELL (RONA)	Supplies	$	39.45
18314	9/16/2016	PETROLIA HOME HARDWARE	Supplies	$	86.07
18315	9/16/2016	PODOLINSKY FARM EQUIPMENT	Vehicle Repair	$	1,661.94
18316	9/16/2016	TRACY PRINCE	Employee Expenses	$	271.80
18317	9/16/2016	PUROLATOR COURIER	Postage	$	57.59
18318	9/16/2016	SIGNS AND DESIGNS	Signage	$	67.80
18319	9/16/2016	Strybosch, Martin	Refund of an Application	$	150.00
18320	9/16/2016	SUPERIOR COMPUTER SALES INC.	Server Warrently Extension	$	1,192.15

18321	9/16/2016	VAN TUYL & FAIRBANK	Supplies	$	85.65
18322	9/16/2016	Ward, Ross J.	Phone Cases	$	180.00
18323	9/16/2016	WATFORD HOME HARDWARE BUILDING	Supplies	$	384.28
18324	9/20/2016	Guthrie, Scott	Trees	$	339.00
18325	10/4/2016	BF ENVIRONMENTAL CONSULTANTS	Project - Bear Creek East of Kimball Rd	$	15,868.97
18326	10/4/2016	Campbells Outdoor Power Equipm	Supplies	$	65.09
18327	10/4/2016	CENTRAL SANITATION	Portable Toilets	$	339.00
18328	10/4/2016	STEPHEN CLARK	Employee Expenses	$	359.34
18329	10/4/2016	COINAMATIC	Laundry	$	60.81
18330	10/4/2016	COLDSTREAM CONCRETE LIMITED	Grates	$	1,283.51
18331	10/4/2016	DOWLER KARN PROPANE	Fuel	$	529.78
18332	10/4/2016	DUCKS UNLIMITED CANADA	Membership Fee	$	35.00
18333	10/4/2016	John Duff Ltd	Stop Logs	$	1,229.44
18334	10/4/2016	ENTERPRISE RENT-A-CAR CANADA L	Car Rentals	$	2,348.14
18335	10/4/2016	GRAY'S FLOWERS & GIFTS	Flowers	$	38.36
18336	10/4/2016	PATTY HAYMAN	Employee Expenses	$	316.89
18337	10/4/2016	KLEEFMAN CLEANING SERVICES	Office Cleaning	$	374.60
18338	10/4/2016	KYIS EMBROIDERY	Uniform	$	36.16
18339	10/4/2016	Lambton Home Building Centre	Supplies	$	651.88
18340	10/4/2016	LANDSTRA CATERING	Meeting Expense	$	149.04
18341	10/4/2016	Leitch, Ross	Fence Line at AWC	$	1,000.00
18342	10/4/2016	MILLIKEN PLUMBING & HEATING LT	Shower - LCH	$	977.45
18343	10/4/2016	Ogden, Erica	Uniform	$	70.01
18344	10/4/2016	ONTARIO MINISTER OF FINANCE	Employer Health Tax	$	4,079.48
18345	10/4/2016	PUROLATOR COURIER	Postage	$	21.18
18346	10/4/2016	Schooley Mitchell Telecom Consultants	Savings Program	$	842.50
18347	10/4/2016	Shannon Vending Limited	Meeting Expense	$	109.90
18348	10/4/2016	SIGNS AND DESIGNS	Signage	$	107.35
18349	10/4/2016	STRATHROY HOME HARDWARE BUILDI	Supplies	$	34.42
18350	10/4/2016	STRATHROY TIRE SALES & SERVICE	Tire Repair	$	28.25
18351	10/4/2016	SUPERIOR COMPUTER SALES INC.	IT Supplies	$	361.60
18352	10/4/2016	TOWNSHIP OF ST. CLAIR	Drain Spraying	$	19.53
18353	10/4/2016	BILL TURNER	Employee Expenses	$	650.39
18354	10/4/2016	JESSICA VAN ZWOL	Employee Expenses	$	103.57
18355	10/4/2016	WARWICK GAS & VARIETY	Fuel	$	438.54
18356	10/4/2016	WATFORD HOME HARDWARE BUILDING	Supplies	$	206.50
18357	10/4/2016	WINKELMOLEN NURSERY LTD.	Trees	$	2,455.49

18358	10/19/2016	21 SHELL & VARIETY	Fuel	$	398.00
18359	10/19/2016	AQUA POOLS,PATIOS & SPAS	Pool Supplies	$	210.42
18360	10/19/2016	Armtec Limited Partnership	Supplies	$	171.12
18361	10/19/2016	Canadian Linen & Uniform	Mats	$	60.51
18362	10/19/2016	ERIN CARROLL	Employee Expenses	$	94.18
18363	10/19/2016	CAS KWARCIAK ELECTRIC	Repairs	$	101.70
18364	10/19/2016	CENTRAL SANITATION	Portable Toilets	$	593.25
18365	10/19/2016	DOWLER KARN PROPANE	Fuel	$	185.29
18366	10/19/2016	FOREST CITY BUSINESS EQUIPMENT	Photocopier supplies	$	372.90
18367	10/19/2016	Hayman, Andrew	Cheque reissued from 2015	$	111.90
18368	10/19/2016	KELLY JOHNSON	Employee Expenses	$	105.40
18369	10/19/2016	J & S LAWN CARE	Lawn Maintenance	$	1,367.30
18370	10/19/2016	Sarah Kellestine - Petty Cash	Petty Cash	$	318.50
18371	10/19/2016	Kern Water	Ice	$	112.50
18372	10/19/2016	KYIS EMBROIDERY	Uniform	$	18.08
18373	10/19/2016	LAFARGE CANADA INC.	Stone	$	431.92
18374	10/19/2016	LARRY MACDONALD CHEV OLDS	Vehicle Repair	$	271.14
18375	10/19/2016	LOBLAW COMPANIES LIMITED	Meeting Expense	$	26.36
18376	10/19/2016	MacKellar, David	Erosion Project	$	7,874.54
18377	10/19/2016	BRIAN MCDOUGALL	Employee Expenses	$	759.59
18378	10/19/2016	McIntyre, Andrew	Employee Expenses	$	419.04
18379	10/19/2016	MILLIKEN PLUMBING & HEATING LT	Furnace	$	6,733.39
18380	10/19/2016	Nantais, Wayne	1/3 contribution to access improvements	$	495.57
18381	10/19/2016	TIM PAYNE	Employee Expenses	$	92.40
18382	10/19/2016	PODOLINSKY FARM EQUIPMENT	Supplies	$	339.47
18383	10/19/2016	TRACY PRINCE	Employee Expenses	$	273.01
18384	10/19/2016	PUROLATOR COURIER	Postage	$	42.82
18385	10/19/2016	Schooley Mitchell Telecom Consultants	Savings Program	$	2,103.11
18386	10/19/2016	JEFF SHARP	Employee Expenses	$	100.00
18387	10/19/2016	STRATHROY HOME HARDWARE BUILDI	Supplies	$	111.86
18388	10/19/2016	STRATHROY RENTAL ONE	Supplies	$	152.55
18389	10/19/2016	SUN MEDIA CORPORATION	Advertising	$	288.67
18390	10/19/2016	SUPERIOR COMPUTER SALES INC.	Toner	$	1,009.09
18391	10/19/2016	THREE MAPLES VARIETY	Fuel	$	550.03
18392	10/19/2016	TOWNSHIP OF ENNISKILLEN	Utilities	$	3,735.19
18393	10/19/2016	TOWN OF PLYMPTON-WYOMING	Water and Sewer	$	154.36
18394	10/19/2016	TOWNSHIP OF WARWICK	Utilities	$	2,918.74

18395	10/19/2016	TOWNSHIP OF ST. CLAIR	Drain	$	25.63
18396	10/19/2016	JESSICA VAN ZWOL	Employee Expenses	$	38.30
18397	10/19/2016	Ward, Ross J.	Supplies	$	50.00
18398	10/19/2016	WASTE MANAGEMENT OF CANADA COR	Garbage Collection	$	1,638.95
18399	10/19/2016	WATFORD HOME HARDWARE BUILDING	Supplies	$	142.26

TOTAL CHEQUE DISBURSEMENTS - BANK #1 - $ 162,569.14

INTERNET BANKING Sept and Oct 2016

TRANS #	DATE	VENDOR	DESCRIPTION		AMOUNT
8496	8/31/2016	BELL CANADA	Telephone/Internet	$	31.61
8497	8/31/2016	OMERS	Pension	$	33,108.12
8498	9/30/2016	BELL CANADA	Telephone/Internet	$	16.04
8499	9/30/2016	BELL CANADA	Telephone/Internet	$	346.53
8500	9/30/2016	BELL MOBILITY CELLULAR	Telephone/Internet	$	68.03
8501	9/30/2016	BLUEWATER POWER	Utilities	$	146.52
8502	9/30/2016	BROOKE TELECOM CO-OP	Telephone/Internet	$	920.02
8503	9/30/2016	ENTEGRUS SERVICES INC. (CHATHA	Utilities	$	1,287.45
8504	9/30/2016	Execulink Telecom	Telephone/Internet	$	862.88
8505	9/30/2016	FCDQ (DESJARDINS)	Office Supplies	$	201.98
8507	9/30/2016	HYDRO ONE Networks Inc.	Hydro	$	49,118.84
8508	9/30/2016	MASTERCARD	Employee Expense	$	7,502.09
8509	9/30/2016	OMERS	Pension	$	34,235.46
8510	9/30/2016	PETRO CANADA INC.	Fuel	$	3,199.42
8511	9/30/2016	RECEIVER GENERAL	Source Deductions	$	54,412.51
8512	9/30/2016	Rogers Cable Communications Inc	Telephone/Internet	$	194.30
8513	9/30/2016	ROGERS WIRELESS	Telephone/Internet	$	596.35
8514	9/30/2016	Township of Dawn-Euphemia property taxes	Property Taxes	$	315.72
8515	9/30/2016	Township of Enniskillen - Property Taxes	Property Taxes	$	3,646.36
8516	9/30/2016	TSC Stores	Supplies	$	395.49
8517	9/30/2016	UNION GAS LIMITED	Utilities	$	28.45
8518	9/30/2016	WORKPLACE SAFETY & INS. BOARD	WSIB	$	6,015.30
8519	9/30/2016	Township of Enniskillen - Property Taxes	Property Taxes	$	3,648.49
8520	10/31/2016	BELL CANADA	Telephone/Internet	$	28.30
8521	10/31/2016	BELL CANADA	Telephone/Internet	$	457.06
8522	10/31/2016	BELL MOBILITY CELLULAR	Telephone/Internet	$	67.80

8523	10/31/2016	BROOKE TELECOM CO-OP	Telephone/Internet	$	915.63
8524	10/31/2016	ENTEGRUS SERVICES INC. (CHATHA	Utilities	$	1,310.23
8525	10/31/2016	Execulink Telecom	Telephone/Internet	$	946.16
8526	10/31/2016	FCDQ (DESJARDINS)	Office Supplies	$	1,060.30
8528	10/31/2016	HYDRO ONE Networks Inc.	Hydro	$	38,047.04
8529	10/31/2016	MASTERCARD	Employee Expense	$	4,328.83
8530	10/31/2016	RECEIVER GENERAL	Source Deductions	$	26,464.23
8531	10/31/2016	Rogers Cable Communications Inc	Telephone/Internet	$	194.30
8532	10/31/2016	ROGERS WIRELESS	Telephone/Internet	$	589.56
8533	10/31/2016	Town of Plympton Wyoming - Property Taxes	Property Taxes	$	1,684.72
8534	10/31/2016	TSC Stores	Supplies	$	8.42
8535	10/31/2016	UNION GAS LIMITED	Utilities	$	29.33
8536	10/31/2016	WORKPLACE SAFETY & INS. BOARD	WSIB	$	5,484.09
8537	10/31/2016	OMERS	Pension	$	35,692.68
8538	10/31/2016	RECEIVER GENERAL	Source Deductions	$	25,227.81

TOTAL INTERNET DISBURSEMENTS - BANK NO. 1 - **$ 342,834.45**

PAYROLL RUNS

PAYROLL NO. 18	$	74,688.14
PAYROLL NO. 19	$	69,610.95
PAYROLL NO. 20	$	67,936.69
PAYROLL NO. 21	$	64,626.28

TOTAL PAYROLL RUNS - **$ 276,862.06**

TOTAL DISBURSEMENTS - **$ 782,265.65**

2016 GENERAL LEVY SUMMARY

GLYSUM2016
Sarah Kellestine
31-Oct-16

MUNICIPALITY	GROSS LEVY	PAID TO DATE	OUTSTANDING
Sarnia	$ 277,949.00	$ 277,949.00	$ 0.00
Chatham-Kent	93,498.00	93,498.00	0.00
Brooke-Alvinston Twp.	11,145.00	11,145.00	0.00
Dawn Euphemia Twp.	17,020.00	12,765.00	4,255.00
Enniskillen Twp.	12,057.00	12,057.00	0.00
Lambton Shores M.	34,406.00	34,406.00	0.00
Oil Springs V	1,390.00	1,390.00	0.00
Petrolia T	17,032.00	17,032.00	0.00
Plympton-Wyoming T	35,855.00	35,855.00	0.00
Point Edward V	16,834.00	16,834.00	0.00
St. Clair Twp.	76,581.00	76,581.00	0.00
Warwick Twp.	14,176.00	14,176.00	0.00
Adelaide Metcalfe Twp.	11,938.00	11,938.00	0.00
Middlesex Centre Twp.	14,757.00	14,757.00	0.00
Newbury V	1,070.00	1,070.00	0.00
Southwest Middlesex M.	7,957.00	7,957.00	0.00
Strathroy-Caradoc M.	57,791.00	57,791.00	0.00
TOTAL	**$ 701,456.00**	**$ 697,201.00**	**$ 4,255.00**

BMO Wealth Management
BMO Nesbitt Burns

Your statement

For the period ending **September 30, 2016**
Date of last statement: August 31, 2016
Primary account: 440-17189

07283

ST. CLAIR REGION
CONSERVATION AUTHORITY
205 MILL POND CRESCENT
STRATHROY ON N7G 3P9

Your Investment Advisor:
JONATHAN BATCH

Phone: 519-646-3044
Batch Investment Group
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One London Place
255 Queens Avenue
London, ON N6A 5R8
Branch Manager:
DAVID HAAK
Phone: (519) 672-8560

Account overview

Canadian dollar account		Market value
440-17189-13 Cash 17189		1,392,884.79
	This month	**1,392,884.79**
	Last statement	1,390,484.79
Grand total in Cdn$	**This month**	**1,392,884.79**
	Last statement	1,390,484.79

You can access your up-to-date account information online through BMO Nesbitt Burns Gateway at:
https://gateway.bmonesbittburns.com
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The US/CDN conversion rate is: 1.3117, as of September 30th.

JTA0720014-0032811-07283-0003-0001-00-

Canadian dollar account

Summary of your investments

	Cash 17189 account Market Value (CDN currency)	% Invested by Asset Class
Cash & short-term investments		75%
Cash	4.79	
Long Positions	1,042,880.00	
Fixed income & related securities		25%
Long Positions	350,000.00	
Total value of your investments	**1,392,884.79**	**100%**

Summary of income and expenses

	This month's income	This month's expenses	Year-to-date income	Year-to-date expenses
Dividends	0.00	0.00	0.00	0.00
Interest	2,400.00	0.00	13,705.11	0.00
Total	**2,400.00**	**0.00**	**13,705.11**	**0.00**

Details of your investments

Cash & short-term investments

Account type	Description	Quantity	Average cost	Total cost (CDN currency)	Market price	Total market value (CDN currency)
Cash	Cash balance as of September 30			4.79		4.79
Cash	BANK OF MONTREAL GIC 30 DAY CASHABLE ANNUAL DUE 05/15/2017 0.850%	200,000	100.000	200,000.00	100.000	200,000.00
Cash	BANK OF MONTREAL MORTGAGE GIC 30 DAY CASHABLE ANNUAL DUE 05/15/2017 0.850%	100,000	100.000	100,000.00	100.000	100,000.00
Cash	BMO TRUST GIC 30 DAY CASHABLE ANNUAL DUE 05/15/2017 0.850%	137,000	100.000	137,000.00	100.000	137,000.00
Cash	HOME TRUST COMPANY GIC ANNUAL DUE 05/15/2017 1.800%	100,000	100.000	100,000.00	100.000	100,000.00
Cash	HOMEQUITY BANK GIC ANNUAL DUE 05/15/2017 1.650%	50,000	100.000	50,000.00	100.000	50,000.00
Cash	PEOPLES TRUST GIC ANNUAL DUE 05/15/2017 1.800%	100,000	100.000	100,000.00	100.000	100,000.00
Cash	HSBC BANK OF CDA GIC ANNUAL DUE 08/16/2017 1.400%	50,000	100.000	50,000.00	100.000	50,000.00

Details of your investments continued on next page

Details of your investments continued

Cash & short-term investments

Account type	Description	Quantity	Average cost	Total cost (CDN currency)	Market price	Total market value (CDN currency)
Cash	ROYAL BANK OF CDA GIC ANNUAL DUE 08/16/2017 1.400%	100,000	100.000	100,000.00	100.000	100,000.00
Cash	VANCITY GIC ANNUAL DUE 08/16/2017 1.400%	100,000	100.000	100,000.00	100.000	100,000.00
Cash	BANK OF MONTREAL GIC 30 DAY CASHABLE ANNUAL DUE 09/13/2017 0.850%	105,880	100.000	105,880.00	100.000	105,880.00
	Total - cash & short-term investments			**1,042,884.79**		**1,042,884.79**

Fixed income & related securities

Fixed income

Account type	Description	Quantity	Average cost	Total cost (CDN currency)	Market price	Total market value (CDN currency)
Cash	CANADIAN WESTERN BANK GIC ANNUAL DUE 05/13/2019 2.200%	100,000	100.000	100,000.00	100.000	100,000.00
Cash	EQUITABLE BANK GIC ANNUAL DUE 05/13/2019 2.200%	100,000	100.000	100,000.00	100.000	100,000.00
Cash	HOMEQUITY BANK GIC ANNUAL DUE 05/13/2021 2.220%	50,000	100.000	50,000.00	100.000	50,000.00
Cash	PRESIDENT'S CHOICE BANK GIC ANNUAL DUE 05/13/2021 2.360%	100,000	100.000	100,000.00	100.000	100,000.00
	Total - fixed income			**350,000.00**		**350,000.00**
	Total - fixed income & related securities			**350,000.00**		**350,000.00**

Total of your investments	**1,392,884.79**	**1,392,884.79**

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Monthly activity

Transaction details

Cash account 440-17189

Settle date	Activity	Description	Quantity	Price	Income/ Expense	Amount (CDN currency)
Sep 1		Opening cash balance				3,484.79
Sep 7	Redemption	EQUITABLE TRUST GIC ANNUAL DUE 09/07/2016 INT 2.400% ISSUE REDEEMED FOR CASH	-100,000			100,000.00
Sep 7	Interest	EQUITABLE TRUST GIC ANNUAL DUE 09/07/2016 INT 2.400% CPN INT ON 100000 BND REC 09/06/16 PAY 09/07/16	100,000		Income	2,400.00
Sep 13	Bought	BANK OF MONTREAL GIC 30 DAY CASHABLE ANNUAL DUE 09/13/2017 00.850% SEP 13 FLAT RELATED OR CONNECTED ISSUER	105,880	100.0000		-105,880.00
Sep 30		Closing cash balance				4.79

Other important information

About this statement

Please let us know within 45 days if any item(s) on this report is incorrect. You can contact your Investment Advisor or the BMO Nesbitt Burns Client Information Centre at 416 594-5920 or toll free at 1 888 769-4444. We may change the amounts on this report if we have omitted an item or if any numbers are incorrect.

Please let your Investment Advisor or Branch Manager know if your investment objectives or your financial situation has changed so we can ensure that you are on track to meet your investment objectives.

BMO Nesbitt Burns makes no guarantee for the accuracy of this information within this statement, including the average cost on individual securities. BMO Nesbitt Burns is not liable for any errors or omissions in this information.

The Average Cost and Total Cost for long positions incorporates the book cost of your investment, comprised of, the total amount paid, transaction charges, commissions and fees, adjusted for any corporate actions, reinvested distributions and return of capital. The Average Cost and Total Cost for short positions incorporates the book cost of your investment comprised of the total amount received, net of any transaction charges, commissions and fees, adjusted for distributions (other than dividends), returns of capital and corporate actions. Book cost on transferred in securities reflects the book cost provided by the transferring institution, or if not provided, the market value on the date of the transfer.

Legend of Average Cost indicators

M - Market Value information was used to estimate part or all of the Average Cost for this security position.
N/D Average Cost for this security holding cannot be determined.
O - Market Value information as of October 2, 2015 was used to estimate part or all of the Average Cost for this security position.

BMO Nesbitt Burns Inc. acted as principal in all transactions shown in this statement with the symbol "‡" in the "Description" column. In all other transactions, BMO Nesbitt Burns acted as agent.

A free credit balance represent funds payable on demand which, although properly recorded in our books, are not segregated and may be used in the conduct of our business. All security positions displayed are segregated unless otherwise indicated. Should there be a security in which the account holds a portion of the quantity segregated and a portion registered in your name, this will be indicated under the security description column.

A copy of our most recent statement of our financial condition and a list of directors and senior officers are available on request. Clients in British Columbia are entitled to certain information about BMO Nesbitt Burns, including information about commission and fees, and any administrative proceedings that may relate to the firm and its staff. For Related and Connected Issuer and Conflicts of Interest Statement, please visit our website: http://www.bmo.com/nesbittburns/about/nb/bmonb/regulatory_documents/conflicts_of_interest.

Prices of the securities in your accounts

We strive to provide accurate and current prices for securities. However, because we use numerous information sources for pricing, we cannot guarantee pricing accuracy for securities. Please call your Investment Advisor for the most current prices.

Legend of Market Price indicators

E- There is no active market for this security so we have estimated its market value.
N- We are unable to obtain a reliable market value for the security. Therefore, in accordance with our standard practice, the market value of the security is not determinable and has been set to zero. This does not mean that the security does not have a value but only that a value cannot be assigned at this time.

Deferred Sales Charge

Securities with 'Deferred Sales Charge' in the security description may be subject to deferred sales charges when sold.

Registered accounts

The trustee for registered accounts is BMO Trust Company.

Investor protection

For non-registered and registered plan accounts, the Canadian Investor Protection Fund protects cash and securities held with BMO Nesbitt Burns Inc. within specified limits. For Preferred or Preferred Plus accounts, deposits in your Canadian dollar bank account with Bank of Montreal are insurable under the Canada Deposit Insurance Corporation Act. Deposits in your U.S. dollar bank account with Bank of Montreal are not insurable under the Act and are not insured by the Canadian Investor Protection Fund. Your securities are protected under the Canadian Investor Protection Fund. Brochures describing the types and limits of coverage are available at your request.

Insurance products

All insurance products, including segregated funds, are offered through BMO Nesbitt Burns Financial Services Inc. by licensed life insurance agents, and, in Quebec, by financial security advisors.

Sales Tax information

The GST/HST registration number for BMO Nesbitt Burns Inc. is 103854261RT.

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St. Clair Region Conservation Authority

2017 Proposed Fees

Draft

Note: All fees include applicable taxes and may be changed by resolution of the Board of Directors

CAMPING FEES	**2017**	**2016**
Reservation Fee	$ 8.00	$8.00
Cancellation Fee	$ 15.00	$15.00
Daily, Unserviced	$ 36.00	$36.00
Daily, Serviced (hydro & water)	$ 43.00	$41.00
Daily, Serviced (hydro only)	$ 40.00	$38.00
60 buck weekend (designated weekends)	$ 60.00	$60.00
Weekly, Unserviced	$ 216.00	$204.00
Weekly, Serviced	$ 258.00	$246.00
Monthly, Unserviced	$ 648.00	$612.00
Monthly, Serviced	$ 774.00	$750.00
Seasonal Camping Fees – April 15, 2017 - April 15, 2018	**2017**	**2016**
Full Payment made on or before April 15 2017 , 30 AMP service	$ 2,155.00	$2,055.00
First instalment payment on or before April 15 2017,30 AMP service	$ 1,500.00	$1,400.00
Second instalment payment on or before June 1 2017, 30 AMP service	$ 690.00	$690.00
Half Season, 30 AMP (after August 1)	$ 1,077.50	$1,027.50
Quarter Season, 30 AMP (after Sept 1)	$ 538.76	$513.75
Seasonal late payment fee	$ 35.00	$35.00
Seasonal Campsite deposit (new seasonal camper wanting to reserve site for following season)	$ 200.00	$100.00
Miscellaneous Fees	**2017**	**2016**
Overnight Visitors (per person)	$ 5.00	$5.00
Sewage Pump Out per service fee	$ 25.00	$25.00
Sewage Pump Out seasonal fee	$ 150.00	$150.00
Winter Storage for Trailers arriving after Thanksgiving	$ 200.00	$150.00
Exterior fridge/freezer charge	$ 150.00	$150.00
Extra hydro fee for electric golf cart	$ 150.00	$150.00
Golf Cart (day/month)	$5.00/$30.00	$ 5.00/$30.00
Extra hydro/Exterior fridge/freezer if found during inspection by staff	$ 200.00	$200.00
Ice	$ 3.00	$3.00
Firewood (bundle)	$ 7.00	$7.00
Firewood (1/2 cord)	$ 35.00	$35.00
Firewood (cord)	$ 70.00	$70.00
DAY USE FEES	**2017**	**2016**
Vehicle	$ 7.00	$7.00
Pedestrians/Cyclists (16 & over)	$ 2.00	$2.00
Seasonal Day Pass	$ 60.00	$60.00
Buses	$ 15.00	$15.00
Open Pavilion reservation	$ 60.00	$60.00
Closed in Pavilion reservation (Warwick/LC Henderson)	$ 100.00	$100.00
Swimming Daily Fee	$ 2.00	$2.00
Seasonal Swimming Pass - Individual	$ 35.00	$35.00
Seasonal Swimming Pass - Family	$ 90.00	$90.00
Maple Syrup Festival - Vehicle Entry	$ 2.00	$2.00
Rental of Grounds for X-Country Meets/Education Days	$ 160.00	$160.00
Rental of Portable Washrooms (On site Only)	$ 30.00	$30.00
Highland Glen Conservation Area (new in 2017)	**2017**	**2016**
Vehicle	$ 5.00	
Seasonal Day Pass	$ 60.00	
Daily boat ramp fee	$ 10.00	
Seasonal boat ramp fee	$ 120.00	

CONSERVATION SERVICES FEES	2017
Managed Forest Tax Incentive Program Plan Approvals	
Field Work / Forest Inventory	$75.00/hr/person
Plan Review & Approval Process (including site visit)	$350.00/plan
Plan Creation & Plan Approval	
Less than 20ac	$500.00/plan
20-40ac	$650.00/plan
Greater than 40ac	$800.00/plan
Timber Management	
Field Work / Site Visit	$62.00/hr/person
Timber Report Creation	$150.00/person/field day
Miscellaneous Fees	
Hunting - McKeough Properties Only (annual permit)	$70.00
Trapping Permit	$10.00
Drain Maintenance Program	
Spot spray application for vegetation control in drains	$100.00/hr + chemical
Tree Planting (Private Lands) These are guidelines, pricing is dependant on size and location	
Large Stock Program	Cost vary according to size and species
Tree Seedlings	Cost vary according to size and species
Seedling Tree Planting Services Machine planting:	
500 - 999 trees	$950/site
1000 – 1950 trees	$0.95/tree
2000 plus trees	$0.90/tree
Includes tree planting and initial herbicide application	
Coniferous planations	15% reduction
Seedling Tree Planting Services Hand planting:	
Refill planting up to 500 trees	$750.00/site
500+ trees	$1.50/tree
Includes tree planting and initial herbicide application	
Herbicide Tending	
0 -1000 trees	$300.00 /application
1000+ trees -machine sprayer single herbicide	$0.30/tree/application
1000+ trees -back pack single herbicide	$0.40/tree/application
Tank Mixes multiple herbicides	$0.50/tree/application
Tree Species (Subject to Availability)	
Coniferous Trees	Native & Traditional Species - bareroot seedlings - 8-12 inches in height
Deciduous Trees & Shrubs	Native & Traditional Species - bareroot seedlings - 12-18 inches in height
All seedlings will be grown from seeds collected in seed zones suitable to St. Clair Region	

St.Clair Region Conservation Authority Planning and Regulation Fees

PLANNING SERVICE FEES	2017		
Technical Report Review and Background Data Collection/Provision**			
Data Requests (plus tax)			
Minimum Base (includes up to 3 data sets) plus $100.00 per data set***	$300.00		
Report Review and Background Data Collection (non EA)	**Natural Hazard**	**Natural Heritage[1]**	**Combined**
Technical Screening and Preconsultation - GIS, Hydrogeological, Ecology, Hydrology****	$200.00 base; combined $500.00***		
Minor Report (scoped)			
Scoped impact study and proposed mitigation measures– (ie. internal review of : floodline, coastal , hydrogeology, geotechnical, meander belt, wetland (scoped EIS/DAR))	$300.00	$300.00	$500.00 (sum of two <$100)
Major Report			
Comprehensive impact study and proposed mitigation measures - (ie. floodline, coastal , geotechnical, hydrogeology, geotech, meander belt, full EIS/DAR)	$500	$2,000.00	$2,400
Waterfront development additional charge for SCRCA coastal engineering review	BOQ[2] ie. Coastal or Geotech $2,000.00 - 3,000.00	N/A	N/A
**1. Authority staff reserve the right to charge technical report review fees over the above noted fees for complex projects having potential significant impact. Costs will be related to multiple technical report reviews, multiple meetings, etc Director and GM to approve fee. 2. Report fee to be reduced by Technical Screening and Preconsultation fees if applicable. Combination of reports submitted concurrently reduced by $100.00 per additional report.			
***data sets - regulation limit mapping, ESA mapping & info, wetland mapping & info, benthic sampling data, water quality data, fish sampling data			
****The CA will charge a fee of Base $200.00; Combined $500.00 to provide preliminary preconsultation coments on all proposed planning applications. This fee will be deducted from the application fee when a formal application is submitted.			
[1]includes applicable adjacent lands			
[2]BOQ - based on quote			
GIS Services (plus tax)			
Technical Reports – Adobe digital (pdf) format on CD (if available)			$55.00
Plotting Services			$9.00/sq ft
GIS Service Fees			$90.00/hr
Digital Aerial Photography (requires license agreement) per tile			$55.00
Admin fee for digital data transfers			$100.00
Municipal Planning Advisory Service Fees	**Natural Hazard**	**Natural Heritage[1]**	**Combined**
Severance (per lot created; Waterfront 2 x)	$200.00	$300.00	$300.00
Minor Variance (Waterfront 2x)			
Minor	$100.00	$200.00	$200.00
Major includes complex natural hazard and/or heritage issues and can involve multiple peer reviews	$200.00	$400.00	$400.00
Zoning By Law Amendment			
Minor	$200.00	$300.00	$300.00
Major includes complex natural hazard and/or heritage issues and can involve multiple peer reviews	$300.00	$500.00	$500.00
Official Plan Amendment			
Minor	$200.00	$300.00	$300.00
Major - includes complex natural hazard and/or natural heritage issues and can involve multiple peer reviews	$300.00	$500.00	$500.00
Combined Consent/ZBA/OPA - discount total by $200.00			
Combined Severance/Variance - discount total by $100.00			
Draft Plan of Subdivision (condo)			
a) 2-4 Units			$500.00
b) 5-15 Units			$1,000.00
c) > 16 Units			$2,500.00
Processing Fee (reactivating file after 1 year dormant)		$250.00 std, $500.00 large (ie OMB)	
File continuation (top up to current cost in fee schedule- files > 2 years from application submission every 2 years)		TBD based on app/review scope	
Site Plans	$200.00, 100.00 value	500.00, $250.00	500.00, $250.00 if value <
Stormwater Management Plans			$500.00
Site Inspection			$100.00
Development Inquiry - fee reduced off Regs app (contingent on no change & within 2 year limit)			
Minor - 1 time interpretation of map/policies/1 bldg envelope plan presented	$200.00	$300.00	$300.00
Major - includes more indepth analysis of options and/or peer consulting internal &/or external	$300.00	$500.00	$500.00
Legal/Property inquiries (Information on regulations and/or natural heritage features for property transactions (ie lawyers, owners, purchasers or agents)			$150.00
Site Assessment (ie Terrestrial/Aquatic Ecosystem Review) plus reporting (2 hrs min)			$90/hr plus exp.

St. Clair Region Conservation Authority Planning and Regulation Fees

Ontario Regulation 171/06 Review Fees	2017
Application	
Reg fee reduced by Development inquiry fee if applicable.	
Technical Screening and Preconsultation - GIS, Hydrogeological, Ecology, Hydrology****	Base $200.00; combined $500.00
MINOR* to cover site inspection, costs email clearances	$150.00
STANDARD** Alter a regulated area, shoreline or watercourse (ie no engineering)	$300.00
MAJOR*** Alter a regulated area, shoreline or watercourse (ie engineering required)	$600.00
STANDARD Addition, accessory building, or reconstruct 500ft² (46.5m²) or less in size	$300.00
STANDARD Construct primary building, addition, accessory buildings or reconstruct greater then 500ft² (46.5m²) in size	$400.00
MAJOR Construct primary building, addition, accessory buildings or reconstruct greater then 500ft² (46.5m²) in size	$800.00
Construct a structure or alter an area of interference of a wetland	
a) Major New, but a prohibition, very rarely rec'd, sig impact	$800.00
b) Standard revised to keep consistent with policy, tech report, EIS review	$500.00
c) Minor	$100.00
Aggregate Resources Act review	$2,000.00
Environmental Assessment Act (private proponent) - minor	$2,000.00
- major	$5,000.00
DART review - Minor	$200.00
DART review - Major (wetland)	$600.00
Drainage Act Engineer's Report Review	$300****
Hearing request fee when submission is in non-compliance with O. R. 171 and/or board approved policies	$500.00
Other Fees	
Golf course development/realignment	$600.00
Application renewal	$50.00
Application revisions beyond 2 resubmissions provided checklist acknowledged	25% fee
Pipeline or Utility directional drill under a watercourse	$100.00/crossing
Review of applications where work has proceeded without authorization	100% surcharge
Multi-lot or Multi Unit Development	$400.00

*Minor- projects for which a letter/response is required from SCRCA. (e.g. is located in Regulated area, may require site visit, may affect the program or policy intersts. Clearance required. Works that are considered minor in nature, identified by factors such as estimated project cost, location & potential degreee of hazard ie. municipal road allowance work, nonindustrial docks that meet policy. Staff may use their discretion to reduce the DART fee

**Standard - projects that meet SCRCA policies, routine technical analysis, may or may not require engineering

**** Section 76 reports are exempt

ADMINISTRATION FEES	2017
Administrative Fees negotiated by contract	
NSF Cheques	$45.00
Processing Fee - Oil & Gas Long term	
a) Oil & Gas Long Term	$340.00
b) Annual	$550.00

EDUCATION FEES	2016/2017
Half Day Class/Student	$4.50
Full Day Class/student	$8.50
Minimum Charge for other programs	$60.00
In Class program (without sponsors) first class	$100.00
In Class program (without sponsors) second class same school	$75.00

WATERSHED SERVICES TECHNICAL FEES	2017
Technical Reports - Adobe digital (pdf) format on CD	$50.00
Data and Information Requests	
a) HEC II, HYMO, Hyrdo Pak, Streamgauge, Precipitation, Meteorological or Flow Data	$100.00
b) hour	$50.00/hr
c) Additional cost for CDs or printed reports	$50.00

2017 Camping Fee Summary	**KB/September 26, 2016**					12.(v)
Conservation Authority	**Seasonal Rate with Winter Storage & Taxes**	**Overnight Serviced (per night)**	**Overnight Unserviced (per night)**	**Vehicle Pass**	**Seasonal Vehicle Pass**	**Pump-out**
Great Canadian Hideaway (*2016 rates*)	$2,344.75 - 30 amp (plus hydro)	$50.85 (30 amp)	$40.68	$5.00/pp $16.00/pp		$113/ season
Upper Thames River (*2016 rates*) (April 22 to October 16)	$ 2,580.00 - 30 amp (reg) $ 2,780.00 – waterfront $ 3,420.00 premium	$ 47.00 (30 amp) Monthly $ 1,220.00 Weekly $ 305.00		$ 13.00	$ 100.00	$275.00 /Biweekly $ 50.00/ pump out
St. Clair Township (Cathcart, Cundick, Mooretown) (*2016*)	$ 2,275.00 (30 amp & sewer)	$40.00 (30 amp & sewers) $ 46.00 (prime campsites) Weekly $250; monthly $765.	N/A			
Kettle Creek Conservation Authority (*2016 rates*)	$2,087.00 - 30 amp (no winter storage available – all trailers removed from site)	$46.00 (30 amp) $40.00 (15 amp) Weekly $283.00 Monthly $ 848.00	$37.00	$ 10.00	$80.00	$ 30 per pump

Our Ponderosa Ipperwash (*2015 rates*)	$3,632.95 - 30 amp Regular site (plus hydro)	$ 58.76 (30 amp) weekdays $ 79.10 weekends		$ 6.78/ person		
Lakewood Christian Campground (*2016 rates*)	Ranges from $ 2,062.25 to $ 2,288.25 30 amp & sewers (winter storage extra)	$ 47.46 - 30 amp (Add $ 5.00 / night for long weekends) Weekly $284.76 (includes hydro, water, sewer)	$ 36.16 (Add $ 5.00/ night for long weekends)	$ 5.65/ person or $ 11.30/ family	$ 39.55/ person or $ 67.80/ family	
Silver Dove Estates Formerly Jefferson Junction (Appin) (*2016 rates*)	$ 2,147.00 plus hydro & winter storage	$ 44.97 - 30 amp	$ 44.97	N/A		
Maitland Valley *2016*	$2,600.00 (30 amp)* $ 2,345.00 (15 amp)* (April 20 to Oct 23) *if paid with credit card	$ 46.00- 15 amp $ 52.00- 30 amp Monthly- $ 1,092.00 Weekly - $ 966.00	$ 36.00	$ 15.00/ vehicle	$ 90.00	
Essex Region (Holiday Beach) (*2016 rates)	$ 2,180.90 (plus hydro new in 2017)		N/A	$10.00	$70.00	
Mitchell's Bay Marine Park (*2016)	Ranges from $ 4,805.15 to $ 3,328.98 (plus hydro)	$45.20 (weekdays) $56.50 (Weekends) (Stat holidays – 3 day minimum)	$ 39.55			$452.00 /biweekly $ 33.90 per pump
St. Clair Region (2016)	$2,055.00 – 30 amp Winter storage, water & hydro included	$41.00 (hydro & water)	$36.00	$7.00	$60.00	$160.00 Bi-weekly $25.00/ pump

St. Clair Region (Proposed for 2017)	$2,155.00 – 30 amp Winter storage, water & hydro included	$43.00 (hydro & water)	$36.00	$7.00	$60.00	$160.00 Bi-weekly $25.00 Per pump

- Fee increases are a result of inflationary and operational increases associated with wages, utilities and general costs
- Even with this increase our rates remain below most local private and regional conservation authority campgrounds

Staff Report

To: Board of Directors
Date: November 1, 2016
From: Brian McDougall, Tracy Prince
Subject: 2017 Draft Budget

At the September 2016 Board meeting the Board was provided an overall summary of the 2017 draft Budget, since that time a copy of the 2017 draft Budget was provided to the Board with an additional briefing note including analysis to municipal budgets, and a shortened version of the slide deck presented to them at the June 2016 budget overview.

One week after providing the Board 2017 Draft Budget Package to the Board Members, the 2017 draft Budget document was provided electronically to all the municipalities. It was requested that all municipalities provide feedback on the budget to us by November 9th, 2016 to provide a verbal report to the Board at this meeting.

We will be requesting the Board to approve the 2017 Draft Budget at the December 2016 meeting.

SCRCA Joint Health & Safety Committee Meeting Minutes

Wednesday, June 8, 2016, 8:30 am

Lower Board Room
205 Mill Pond Crest.
Strathroy, ON

Meeting called by:	JHSC Committee	**Type of meeting:**	Quarterly
Facilitator:	Jeff Sharp	**Minutes:**	Patty Hayman
Attendees:	Kevan Baker, Jeff Sharp, Don Skinner, Sarah Hodgkiss, Guest Presenter: Steve Clark Recorder: Patty Hayman		

Minutes of Agenda Items

1. Motion to approve March 8, 2016 meeting minutes
   Motion: that "The Minutes of the March 8, 2016 JHSC meeting be approved as printed." **M**oved/**S**econded/**C**arried – **Sarah/Jeff/Carried**

2. Business arising from the minutes
   2.1. Review of Action Items
   Steve Clark reported on:
   - **Updated policy & procedure for dam safety** *(September 23, 2015 – item 4.1, Dec. 2, 2015, March 8, 2016 – item 2.1 – Steve C.)*
     Discussion:
     - circulated and reviewed the Draft A31 Dam Maintenance Operations report
     - discussion around entering the wells

     Action Item(s):
     - **Steve Clark** to revise the above report and include in Health and Safety Manual
     - **Steve C**. to draft special circumstances for accessing the wells at Strathroy and Petrolia Dam.
     - draft report with revisions as proposed approved in principle by JHSC
     - to be brought forward at September JHSC meeting

   Kevan Baker reported on:
   - **new WHMIS training program for all staff** *(Sept. 23, 2015, Dec. 2, 2015, March 8, 2016 - item 2.1 - Kevan) (See attached list of staff needing WHMIS 2016)*
     Discussion:
     - new and existing staff have been/are being trained in WHMIS 2015
     - refer to training matrix for up to date list

     Action Item(s):
     - ongoing with new staff as they are hired
   - **development of gas storage area with venting at McLean** *(June 15, 2015 - item 3.2; Sept. 23, 2015; Dec. 2, 2015 - item 2.1 - Kevan)*
     Discussion:
     - gas storage has been established outside the workshop.

     Action Item(s):
     - completed.
   - **Managers' review of Risk Assessments/Policies & procedures that impact staff specific jobs by Department** (*March 8, 2016 - item 2.1 – Kevan)*
     Discussion:
     - Lands staff have reviewed and updated where necessary

- Supervisors and Managers need to review

Action Item(s):

- Supervisors & Managers to review and update where necessary - ongoing

- **review of backing up procedures/hazards with staff at February full staff meeting** *(Dec. 2, 2015 – item 4.1& March 8, 2016 – item 2.1 Kevan)*

Discussion:

- reviewed with staff at the April full staff meeting

Action Item(s):

- completed

- **development of fact sheet for staff to sign off on which will be added to the Vehicle Training Package re: hazard inspections & action plans in parking lots** *(Dec. 2, 2015 – Item 4.1& March 8, 2016 items 2.1 Kevan and 4.3)*

Discussion:

- fact sheet/test was provided during training
- staff signed document to acknowledge training
- scanned documents added to Training Matrix

Action Item(s):

- completed with current staff – ongoing for new staff
- **Heather** to add sign off test to Vehicle Training Package on Sharepoint

- **development of fact sheets and sign-off sheet for Lyme disease** (*March 8, 2016 - item 4.4)*

Discussion:

- circulated to all staff and added to Training Matrix

Action Item(s):

- completed

Jeff Sharp reported on:

- **development of updated Accident Packages** *(Dec. 2, 2015 – item 2.1 – Steve & March 8, 2016 – item 2.1 - Jeff)*

Discussion:

- in progress - propose to address in next couple of months

Action Item(s):

- Jeff to bring a draft forward at the September JHSC meeting

- **discussions at full staff meeting re: wearing proper PPE, ladder training, spotters when moving port-a-potties and workplace injury information from MOL website** – item 5.1 *(2015 JHSC Goals & Objectives – item 5.1 and Sept. 23, 2015, Dec. 2, 2015 & March 8, 2016 - item 2.1 - Jeff)*

Discussion:

- ongoing re: PPE, ladder training (see below)
- Re: port-a-potties - CA staff have adapted new procedure for moving port-a-potties so a spotter isn't necessary.

Action Item(s):

- Jeff to discuss PPE at the June full staff meeting

- **recording of near misses following email sent to all staff in December, 2015** *(Sept. 23, 2015 - item 4.3 & Dec. 2, 2015 item 2.1 Jeff) (To be followed up with staff after field season and discussed at September JHSC meeting)*

Discussion:

- ongoing. Jeff has not received any recordings to date

Action Item(s):

- **Jeff** to send follow up email to all staff, after field season
- to be discussed at Sept. JHSC Meeting

- **external ladder safety training** (*March 8, 2016 - item 4.2)*

Discussion:

- Ontario Safety Group has training info online
- to be reviewed to see if appropriate for SCRCA staff.

Action Item(s):
- **Jeff** to review and report back at September JHSC meeting

- **Update of Health & Safety Policy Manual Change Log**

Action Item(s):
- Heather to continue working on this as well as the links in the index

Don Skinner to report on:

- **required length for fall restrict at Petrolia & proposed rescue plan** *(March 8, 2016 – item 2.1 - Don)*

Discussion:
- Don circulated the proposed rescue plan
- entering the water would be a separate item from the rescue plan

Action Item(s):
- **Don** to provide rescue plan to Steve C. and request the two document (Dam Operations and Dam Rescue Plan) be merged
- **Steve C** to complete by September JHSC meeting

Sarah H to report on:

- **information re: fire extinguisher safety** *(March 8, 2016 item 2.1 – Sarah)*

Discussion:
- investigation of current procedures indicates that inspection and safety standards are being met

Action Item(s):
- completed

- **requirements for posting "The Green Book" on all Health & Safety boards** *(March 8, 2016 item 2.1 – Sarah)*

Action Item(s):
- **Sarah H** to email Ministry of Labour to clarify what version should be posted and how often they need to be replaced

3. Area Reports/Workplace Inspections

3.1. LCH, WWK, AWC, McLean – (**Kevan & Don**)

Discussion:
- Don presented the findings and most have been resolved.

Action Item(s):
- **Terry** to completed Evacuation Plan for LCH

3.2. LCH Education Centre – (**Kevan & Don**)

Discussion:
- inspected
- need to locate completed report

Action Item(s):
- **Rick Battson** to attend the Fall inspection

3.3. General CAs – Strathroy, CW, McKeough (**Jeff**)

Discussion:
- no issues or inspections in these areas since last meeting

4. New Business

4.1. Review of Incident/Injury Investigation Reports since March 8, 2016 meeting

Discussion:
- 3 reports were reviewed

Action Item(s):
- **All Staff** requested to download and complete the most up to date forms (from Sharepoint)

5. Goals and Objectives in 2016

5.1. To regularly review MOL website to educate ourselves and learn from documented investigations and fines (ongoing)
5.2. To review Safety Manual and make changes as necessary (ongoing)
5.3. To appoint a worker rep. in September, 2016 for a 3 year term (to replace Jeff Sharp)
5.4. Conduct workplace inspections as required (at least one location each month)
5.5. To encourage supervisors to complete safety reviews and 5 point check lists on a more frequent basis (ongoing)
5.6. To update the JHSC files on the O drive (ongoing)
5.7. To recommend that Supervisors schedule retraining refreshers with their staff, once a month (ongoing)
5.8. To incorporate the drivers' safety training program into our orientation of all staff (in process)
5.9. To send occasional Health & Safety Bulletins to all staff (Hot & Cold Weather Alerts, Vector Borne Diseases etc.)
5.10. Establish a new Workplace Inspection Report specific for each location (see also item 2.1 (Kevan)

6. Proposed future 2016 meeting dates:
September 14th, November 30th

7. Adjournment – 10:03 am
Motion: that "The meeting be adjourned." **M**oved/**S**econd/**C**arried – **Sarah/Don/C**

Misc. Information

Contacts:	Worker Co-chair/Inspector:	Jeff Sharp	jsharp@scrca.on.ca
	Management Co-chair:	Kevan Baker	kbaker@scrca.on.ca
	Worker Reps.:	Sarah Hodgkiss	shodgkiss@scrca.on.ca
		Jeff Sharp	jsharp@scrca.on.ca
		Don Skinner	dskinner@scrca.on.ca
	Committee Secretary:	Heather Long	hlong@scrca.on.ca
	Meeting Secretary:	Patty Hayman	phayman@scrca.on.ca

Kevan Baker — Sept 26/16
Signature of Co-chair — Date

Sept 23/16
Signature of Co-chair — Date

Staff Report

12. (ix)

To: Board of Directors
Date: October 18, 2016
From: Marlene Dorrestyn, Administrative Executive Assistant
Subject: Nominating Committee

The Nominating Committee meets annually at the end of January or in early February (tentatively February 2, 2017) and recommends directors to serve on various Committees.

Executive Committee

- seven members to be recommended to the Annual General Meeting
- consideration should be given to representation from each of the 4 districts
- meets once annually on average in January or early February

Flood Action Committee

- Conservation Authority Chair, Vice Chair, Authority members from St. Clair Township and Chatham-Kent
- meets once annually on average in January

Low Water Response Committee

- Conservation Authority Chair, Vice Chair and 3 or 4 other members (one each of Middlesex, Sarnia/Lambton and Chatham-Kent)
- meets once annually on average in spring

2016 Nominating Committee consisted of:
Sarnia – Cindy Scholten
Lambton – Muriel Wright
Chatham-Kent – Jeff Wesley
Middlesex – Norm Giffen
Authority Chair, ex officio
Authority Vice Chair, ex officio

Staff Report

12. (x)

To: Board of Director
Date: October 18, 2016
From: Marlene Dorrestyn, Administrative Assistant
Subject: 2017 Tentative Schedule of Meetings

Board of Directors:

February 16 (3rd Thursday) - Annual General Meeting (Alvinston)
April 20 (3rd Thursday)
June 22 (4th Thursday)
September 21 (3rd Thursday)
November 9 (2nd Thursday)
December 14 (2nd Thursday)

Executive Committee: at the call of the chair.

All Board of Director and Executive Committee meetings are held at the Administration Office at 10:00 a.m., with the exception of the June meeting which follows the Project Tour.

Flood Action Committee: January 12 (2nd Thursday) and at the call of the Chair

Low Water Response: May 18 (3rd Thursday) and at the call of the Chair

Nominating Committee: At the call of the chair.

Please Note: This is a tentative schedule and circumstances may necessitate changes. Accordingly, these dates should be confirmed with the Administration Office prior to the meeting date.

Staff Report *12.(x)*

To: Board of Directors
Date: October 18, 2016
From: Tracy Prince, Director of Finance
Subject: AODA – 2016 Updated Training

All Board and Staff need to have the updated integrated Customer service and AODA training to remain compliant.

You can complete this training at home on your computer using the links provided in the Board Package section 12(x), or the lower boardroom is set up for you to complete today. If you cannot complete it today and you want to do the training here at the office, please advise Marlene and we will arrange for you to complete the training here before November 18th.

AODA Training

What is AODA?

The purpose of the Accessibility for Ontarians with Disabilities Act, 2005 (AODA) is to ensure that all Ontarians have fair and equitable access to programs and services and to improve opportunities for persons with disabilities. The Act will eventually cover all of these areas:

- Customer Service Standards
- Information and Communication
- Employment
- Transportation
- Built Environment

The Customer Service Standard was the first standard to become law as regulation. This standard provides guidelines and examples of how persons with disabilities can be served and accommodated when accessing services or participating in programs.

What is a 'disability'

- any degree of physical disability, infirmity, malformation or disfigurement that is caused by bodily injury, birth defect or illness and, without limiting the generality of the foregoing, includes diabetes mellitus, epilepsy, a brain injury, any degree of paralysis, amputation, lack of physical co-ordination, blindness or visual impediment, deafness or hearing impediment, muteness or speech impediment, or physical reliance on a guide dog or other animal or on a wheelchair or other remedial appliance or device,
- a condition of mental impairment or a developmental disability,
- a learning disability, or a dysfunction in one or more of the processes involved in understanding or using symbols or spoken language,
- a mental disorder, or
- an injury or disability for which benefits were claimed or received under the insurance plan established under the *Workplace Safety and Insurance Act, 1997*; ("handicap")

What is a 'barrier'

- means anything that prevents a person with a disability from fully participating in all aspects of society because of his or her disability, including a physical barrier, an architectural barrier, an information or communications barrier, an attitudinal barrier, a technological barrier, a policy or a practice; ("obstacle")

Points to convey

Removing barriers

- A major barrier for people with disabilities is attitudes.
- Removing physical barriers is a start, and can be the easiest barrier to remove.
- Building accessibility into the life and operation of an organization can help avoid costly accessibility mistakes or the creation of unintentional barriers.

Statistics

- About one in seven (1.85 million) Ontarians has a disability
- Over 47 per cent of people over the age of 65 have disabilities
- As the general population ages, the number of people with disabilities will increase

Spending Power

- Customers with disabilities form a significant consumer group with a spending power of $21-25 billion a year, according to the Royal Bank of Canada.
- People with disabilities like to eat out, travel, work and enjoy retirement
- 75 per cent of people with disabilities in Canada, Europe and the United States are physically and financially able to travel
- Seniors and people with disabilities will represent 20-25 per cent of the Canadian recreation, retail, entertainment, work place and housing marketplaces in the next 10 years and beyond

Employment opportunities

- People with disabilities are an untapped labour market potential

(Source: Statistics Canada's Participation and Activity Limitation Survey (PALS) 2001)

Handouts

Test your knowledge quiz
Tips for Guiding a Customer who has Vision Loss
Instructions on Helping Someone with an Assistive Device
How to use a TTY and the Telephone Relay Service
SCRCA's Integrated Accessibility Standards Policy and Plan - http://www.scrca.on.ca/wp-content/uploads/2014/10/accessible-standards-policy-REVISED-2014.pdf

Customer Service Standard video

ATTENTION | Serve-Ability: Transforming Ontario's Customer Service

Review all 6 modules

Ontario Human Rights Code

View the following 5 videos

1. Part 1: Working Together
   https://www.youtube.com/watch?v=EOicdh2C8A0

2. Part 2: The Code
   https://www.youtube.com/watch?v=UN02D6zJExI

3. Part 3: Understanding the Duty to Accommodate
   https://www.youtube.com/watch?v=O88pcfAjN20

4. Part 4. Applying Human Rights Principles
   https://www.youtube.com/watch?v=FPBmoMpAJi8

5. Part 5. Compliance and Enforcement
   https://www.youtube.com/watch?v=m27F6yJ-FMo

Test your Knowledge Quiz

Discuss Answers

Have employees sign and date the quiz as acknowledgment that they took the training.

Read SCRCA's Integrated Accessibility Policy and Plan

https://www.scrca.on.ca/wp-content/uploads/2013/06/Accessibility-Customer-Service-Plan.pdf

Test your Knowledge

Name: _____

Date: _____

1. Under the AODA, different standards on accessibility are being developed that will set requirements for the identification, removal, and prevention of barriers for people with disabilities in key areas of daily living.	True	False
2. The customer service standard is a voluntary standard. Your business or organization can decide whether or not to put it into practice.	True	False
3. The term “disability” only applies to people who use wheelchairs.	True	False
4. Avoiding someone because of their disability is a barrier in attitude.	True	False
5. Your organization must accept feedback about the manner in which it provides goods or services to people with disabilities.	True	False
6. You should not ask your customer to repeat himself if you don’t understand him the first time. It might offend him.	True	False
7. If a person has vision loss they cannot see anything.	True	False
8. It’s helpful to someone who uses a hearing aid if you reduce background noise.	True	False
9. You should always speak directly to your customer, not to her support person or companion.	True	False
10. If your customer uses a manual wheelchair, feel free to push her around your store.	True	False
11. You can always tell when someone has a disability.	True	False
12. Assistive devices enable a person with a disability to do everyday tasks and activities.	True	False
13. Your organization must allow people with disabilities who use a support person to bring their support person with them while accessing goods or services on parts of the premises that are open to the public.	True	False
14. Service animals should be treated as pets.	True	False

Answers to "Test your Knowledge"

1. True
2. False: All providers of goods and services to the public or other third parties with one or more employees and all designated public sector organizations in Ontario must comply with all of the applicable requirements of the customer service standard.
3. False: The AODA uses the same definition of "disability" as the Ontario Human Rights Code, which includes both visible and non-visible disabilities. The term "disability" does not only apply to people who use wheelchairs.
4. True
5. True
6. False: If you can't understand what your customer is saying, just politely ask again.
7. False: Few people with vision loss are totally blind. Many have limited vision such as tunnel vision, where a person has a loss of peripheral or side vision, or a lack of central vision, which means they cannot see straight ahead. Some people can see the outline of objects while others can see the direction of light.
8. True
9. True
10. False: Don't touch a person's wheelchair or assistive device without permission.
11. False: Disabilities can be visible and non-visible. You can't always tell who has a disability.
12. True
13. True
14. False: Service animals are working and have to pay attention at all times. Don't touch or address them.

Staff Report *13. (i)*

To: Board of Directors
Date: October 26, 2016
From: Rick Battson
Subject: Communications Progress Report

Memorial Forest Dedications

From September 2015 – August 2016, 538 trees were dedicated. 487 of these trees were through funeral home partnerships and 51 were through individual donations to the program.

Two dedications were held in the month of September. The last dedication for the McKenzie and Blundy memorial forest program was held on September 18 at the Wawanosh Wetlands Conservation Area. Steve Arnold brought greetings from the Foundation and Authority. Approximately 800 people attended. In her remarks, Katherine Scimmi, Owner and President of the Funeral Home indicated that they may be interested in continuing with support for the Foundation through a continuation with a tree planting program. It was suggested to her afterward that she should contact us when they are ready to discuss a renewed program.

The Foundation's dedication was held on September 25 at the Lorne C. Henderson Conservation Area. Duncan Skinner and Steve Arnold provided the remarks. Approximately 70 people attended.

To date, 14,504 trees have been dedicated at 45 sites throughout our region.
McKenzie and Blundy Funeral Home – 7,193 trees dedicated (218 in 2016)
Denning Brothers Funeral Home – 2,838 trees dedicated (181 in 2016)
Nicholls Funeral Home – 2,035 trees dedicated (88 in 2016)
Dodge/Denning Funeral Home, Forest – 531 trees dedicated
Individual Donations – 1,907 trees dedicated (51 in 2016)

Conservation Awards

A list of possible conservation award recipients will be brought forward at our board meeting in December. Board members wishing to nominate any individual or organization, should contact Rick Battson at the office.

Conservation Foundation

The St. Clair Region Conservation Foundation raises funds to support the work of the Conservation Authority. At a recent meeting, the Foundation approved support for a number of projects and programs:

- $3,000 to support Conservation Scholarships
- $5,000 to support a 3D mapping project
- $6,000 land management staff costs for Foundation owned lands
- $7,000 for trails at Conservation Areas
- $7,000 to support memorial tree planting
- $8,000 to finance a summer Conservation Intern position
- $10,000 to support the Watershed Report Cards
- $50,000 to support Conservation Education

Conservation Education Fundraising

One of the main Authority programs supported by the Foundation is Conservation Education. This support includes efforts to secure funds from corporate donors, special events and from support through the bingo program. In addition, the Conservation Authority applies for government grants to support the education program. Support for 2016 included:

Sarnia-Lambton Environmental Association: SLEA will continue its funding of the *River Bottom Critter* and the *Go With The Flow Groundwater* programs in the amount of $30,000. The *River Bottom Critter* program is targeted at grades K – 10 and the *Go With The Flow Groundwater* program at grades 4 – 8.

Union Gas: Union Gas continued its support the *Spring Water Awareness* Program in 2015 in the amount of $5,000. Union gas has supported this program for 5 years. This program targeted at grades K – 6.

Friends of the St. Clair River: The FOSCR is providing $2,000 to support an in-class program called the *River RAP*. This program is introduced using the RAP video supported by the Foundation in previous years. This program is targeted at grades 8 – 10. We have requested for an additional $2,000 to help with the shortfall in fees caused by the elementary teachers work action.

For 2017, funding from the Healthy Kids Community Challenge Lambton has been secured. This project is led by Nicole Boyer, Project Coordinator for Healthy Kids Community Challenge Lambton. A number of municipalities and health units are involved along with the St. Clair Region and others. We were successful in receiving approval for $118,000 for a number of initiatives. Of interest to the Authority/Foundation is the approval of $8,500 for Conservation Education Programs for the SCRCA.

Staff Report *13.(ii)*

To: Board of Directors
Date: October 28, 2016
From: Sharon Nethercott, Melissa Gill
Subject: Conservation Education Progress Report

Fall Education Programs

Education staff have been enjoying the good weather during a very busy fall. Programming is booked up through to December with many programs booked into the New Year and beyond.

Preparation and presentation of Specialist High Skills Major programming has been a major focus. The following SHSM programs have been developed and offered to the Lambton Kent District School Board: Tree Planting, GPS/GIS, Nutrient Management, and Principles of Drainage. Watershed Management will be presented November 1st.

Properties of Drainage & Nutrient Management Certification Program:
The Biology Department assisted in delivery of the program to 30 area Grade 11 and 12 Specialist High Skills Major Agricultural students. Topics discussed included history of drainage in our watershed, The Drainage Act, benefits and challenges of drainage, nutrient impacts, watershed management & water quality concerns.

We recently learned about Experiential funding that should be available from the Province to schools in the fall of 2017. Funding will help to off set the cost of Conservation Field Trips for local schools. Outdoor Education funding from the Province has been on going for 4 years.

Events

Henderson Geocaching Event, September 18

A beautiful day was forecast for the 8th annual event which attracted over 45 enthusiastic geocachers. Many participants were impressed by the trails and campground facilities. Participants came from as far away as the United Kingdom, Windsor, London and Michigan.

Children's Water Festival

There was record attendance of more than 600 elementary students each day over the 3-day festival. Daily attendance on site was in excess of 900 people which included high school students, volunteers, teachers, educational assistants and parent helpers. There was high media interest in show casing over 40 hands on water conservation activities geared for students in grades 3 to 5. More than 12,000 elementary students have now attended this festival over the past 8 years.

Mini Rekindle the Spark Workshop

SCRCA staff shared our success with Specialists High Skills Major programs offered to local school boards at Wildwood C.A. on September 9. The workshop is always an excellent opportunity to share ideas with other outdoor educators.

Lambton Upland Game Bird Youth Day

On August 27th, staff participated in the annual Youth Day hosted by the Lambton Upland Game Bird Chapter. SCRCA provided children with a nature-based conservation activity; hunting for insects with sweep nets! Connections were made between the insects and the ecology of farming, fishing and general ecosystem support. We also found a snake in our hunt, so the important roles of reptiles in our watershed were discussed.

Wyoming Fair Agriculture in the Classroom

Staff provided information and a hands-on learning game for approximately 300 students in grades 3-6. SCRCA Staff discussed the important role farms play to help maintain healthy wetlands, forests and overall watershed health.

Species at Risk Program, Kettle & Stony Point First Nation

September 28th and Oct 12th: As part of the annual education days at Kettle Stoney Point First Nations School, students in Grade 3 and 4 participated in both outdoor and indoor educational activities with 3 SCRCA staff. During our 'outdoor visit' students visited Shashawanda Creek to investigate the life supported there. The indoor day focused on Species At Risk, specific to Kettle/Stoney Point, encouraging the kids to share their own experiences and learn new ideas through games, crafts and stories.

River Day at Riverview School

October 18th, 2016: Working with the Biology Department to fulfill Trillium Grant deliverables, we engaged the entire school of 160 students in a River Day Celebration at Marshy Creek Park along the St. Clair River. Students participated in Fish survey demonstrations and grade appropriate curriculum connected games and activities.

Staff Report *13.(iii)*

To: Board of Directors
Date: October 28, 2016
From: Rick Battson, Director of Communications
Brian McDougall, General Manager
Subject: Conservation Strategy

At the September meeting, a strategic plan was distributed along with a questionnaire and a recommendation to seek input from our stakeholders. The Strategy was distributed to board members, Foundation board members, municipalities and several other stakeholders. It was posted on the website and was promoted through Facebook.

We received two completed questionnaires. Both were supportive and offered comments of support and comments that provided suggestions as to ways to succeed with our strategic actions. A number of comments focused on controlling costs of implementing the strategy. There were no comments that would necessitate changes in the Strategy, rather they could be incorporated in yearly work plans.

Examples of the comments:
“Look at what other CAs and farm organizations are doing in order to improve our current actions”
“Be on the lookout for forthcoming grants at all times”
“The four goals address our current needs at this time, but will need to be reviewed on a regular basis”
“The impacts of climate change must be addressed in a proactive manner which limits loss of property and our natural resources”
Re: focus on phosphorous – “need to work at the international level to achieve success
Re: improve regulation mapping – “Yes this would be helpful in explaining decisions relative to floodplain delineation”

Recommendation: That the Board of Directors approves the 5-year Strategic Plan entitled, “Our Future to Shape – A Way Forward”.

Staff Report

14.(i)

To: Board of Directors
Date: November 1, 2016
From: Brian McDougall, General Manager
Subject: Source Water Protection

Staffing

- last month, Michelle Fletcher Source Water Protection Project Coordinator for Thames-Sydenham & Region Source Protection Region confirmed that she would be assuming the position of Aquatic Biologist at the Upper Thames River Conservation Authority at the end of December
- loday it was announced that Jenna Allain will be taking over the Project Coordinator position at the beginning of January - Jenna has been with the Ausable Bayfield Maitland Valley Source Protection Region program for 8 years and has been coordinating their program for the last 4 years

Risk Management Services

- in September and October, the Project Coordinator met with all municipalities requiring risk management services – both those contracting the Source Protection Region for risk management services and those who are undertaking services or contracting services from other sources
- reporting requirements and status updates were shared
- some municipal staff indicated that they may be looking to the Source Protection Region for risk management services in the future
- current risk management services contracts end in August 2017 and include a clause for renewal 6 months in advance of the contracts end date – as a result Source Protection Region staff will be engaging the municipalities in renewal discussion in the near future with the intention of having approvals in place by March 2017

Provincial “Status” of Source Water Protection

- the Ministry of Environment and Climate Change (MOECC) has been meeting with Source Protection Regions to solicit comments on the future of source protection
- most of the interest is based around funding of the Region’s roles moving forward
- MOECC is seeking an understanding of the costs of the ‘mature’ state of the program – envisioned for 2019 and beyond – viewing the next 2 years as transition to that mature state
- MOECC staff have indicated that they expect only minor reductions to funding for Source Program Regions as we move through this transition