Bass Lake
Outlet Berm - Options Evaluation

Public Information Session
June 22, 2019
1. Introduction
2. Project Background and Process
3. Outlet Options
4. Next Steps
Who We Are
Local Expertise, Community focus

Steve Arends, P.Eng

Doug Nuttall, P.Eng

Alex Sereda, E.I.T.
Our Perspective
Responsibilities of an Engineer

1. Duty to protect public health & safety
2. Duty to protect property & the environment
3. Duty to the client
1. Desktop review of existing documentation, correspondence, modeling, etc
2. Site Investigation
3. Public survey and stakeholder consultation
4. Option Analysis and Recommendation
“Terms of Reference” for RVCA requirements for submission for any proposal/development relating to a “water control structure” at the outlet of Bass Lake

Background: This is in response to providing information/assistance as requested from some Bass Lake property owners who have concerns that the existing illegal berm at the outlet of Bass Lake is failing and that low water levels will become the new normal on the Lake should current conditions either continue or the berm fail.
Public Survey and Stakeholder Consultation

1. Jp2g: 350 hard copies printed and distributed
2. Township: Online survey and print advertisements
3. 110+ responses received
4. Will be accepting further survey responses and stakeholder input until June 24th
1. Natural justice, why we had a broad survey
Q2: Role (% of Respondents)

- Resident: 90%
- BLPOA Member: 70%
- General Interest: 10%
- Other: 10%
Q3: How are you impacted by lake water levels?

<table>
<thead>
<tr>
<th>Impact</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private road access</td>
<td>13</td>
</tr>
<tr>
<td>Public road access</td>
<td>0</td>
</tr>
<tr>
<td>Recreational use</td>
<td>82</td>
</tr>
<tr>
<td>Shoreline flooding or erosion</td>
<td>34</td>
</tr>
<tr>
<td>Other</td>
<td>40</td>
</tr>
</tbody>
</table>
Q4: Have you experienced negative impacts from high water levels?

- Private road flooding: 5%
- Public road flooding: 0%
- Water encroachment on private property: 1%
- Shoreline erosion: 21%
- Other (None): 61%
Public Survey and Stakeholder Consultation

Q5: Have you experienced negative impacts from low water levels?

- Boating/swimming access and safety: 80
- Water Intake Issues: 60
- Weeds: 80
- Dock Damage: 20
- Other (None): 0
Q6: How do you feel about the average water level in Bass Lake?

- Should be lower: 0%
- Should be maintained to match existing condition: 42%
- Should be higher: 58%
### Q7: How do you feel about the seasonal high water level in Bass Lake?

<table>
<thead>
<tr>
<th>Option</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Should be lowered to protect private property</td>
<td>1</td>
</tr>
<tr>
<td>Should be lowered to protect private road access</td>
<td>1</td>
</tr>
<tr>
<td>Should be lowered to prevent shoreline erosion</td>
<td>0</td>
</tr>
<tr>
<td>Should be lowered to match existing condition</td>
<td>82</td>
</tr>
</tbody>
</table>
Q8: Please rank your preferred alternative to managing the Bass Lake outlet

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Total Accumulated Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Outlet management</td>
<td>30</td>
</tr>
<tr>
<td>Rehabilitate existing berms</td>
<td>212</td>
</tr>
<tr>
<td>Naturalized outlet</td>
<td>107</td>
</tr>
<tr>
<td>Concrete weir</td>
<td>194</td>
</tr>
<tr>
<td>Other</td>
<td>27</td>
</tr>
</tbody>
</table>
Q9: What would be a reasonable budget to improve the lake outlet (including engineering, construction, and permitting costs)?

- Less than $100,000: 44%
- $100,000 - $300,000: 31%
- $300,000 - $600,000: 10%
- $600,000 - $1,000,000: 8%
- More than $1,000,000: 7%
Q10: Please assign a relative weight to the following evaluation factors: (total must = 100)

- Cost effective: 235
- Assessment of risk to the Township and safety of public (including property): 183
- Significance of impacts to the existing ecosystem and natural conditions: 267
- Addressing stakeholder concerns: 265
- Timely: 231
Q11: When should final construction (if any) be complete?

- Fall 2019, 55
- Fall 2020, 14
- Summer 2020, 9
- Spring 2020, 21
- Further study required, 4
- No construction, 0
Summary of Preliminary Analysis
Understanding Regulatory Constraints and Approvals

- DFO
- MNRF
- RVCA
- MECP
- Transport Canada
- Township of Rideau Lakes
Prohibited activities re watercourses, wetlands, etc.

28 (1) Subject to subsections (2), (3) and (4) and section 28.1, no person shall carry on the following activities or permit another person to carry on the following activities, in the area of jurisdiction of an authority:

1. Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland.

2. Development activities in areas that are within the authority’s area of jurisdiction and are,
   i. hazardous lands,
   ii. wetlands,
   iii. river or stream valleys the limits of which shall be determined in accordance with the regulations,
Summary of Preliminary Investigation
Summary of Preliminary Investigation
Summary of Preliminary Investigation
Summary of Preliminary Investigation
Summary of Preliminary Investigation
Summary of Preliminary Investigation
### Summary of Preliminary Investigation

<table>
<thead>
<tr>
<th>Flow</th>
<th>Results (m³/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Q_{1.25}$</td>
<td>1.63</td>
</tr>
<tr>
<td>$Q_2$</td>
<td>1.72</td>
</tr>
<tr>
<td>$Q_5$</td>
<td>2.12</td>
</tr>
<tr>
<td>$Q_{10}$</td>
<td>2.46</td>
</tr>
<tr>
<td>$Q_{20}$</td>
<td>2.87</td>
</tr>
<tr>
<td>$Q_{50}$</td>
<td>3.41</td>
</tr>
<tr>
<td>$Q_{100}$</td>
<td>3.84</td>
</tr>
<tr>
<td>$Q_{200}$</td>
<td>4.3</td>
</tr>
<tr>
<td>$Q_{500}$</td>
<td>4.82</td>
</tr>
</tbody>
</table>
Summary of Preliminary Investigation

Suggested Next Steps:

1. Consensus from Lake Property owners for a low flow type water control structure at the outlet.

2. Financial commitment from Lake Property owners to determine status of the stability of the existing berm without the sandbags recently placed on the berm.

3. Retain a Professional Engineer to determine stability of the existing berm.

4. Determine need for an official lake outlet control structure with or without rehabilitation or restoration of the original (not including work completed in 2018). Confirmation from RVCA OMNRF and the municipality that a water level range is suitable, attainable and manageable.

5. If required, a preliminary financing plan, maintenance plan, property owner agreement must be established.

6. Design of proposal which will include all details noted above.

7. Submission of applications for approval with supporting documentation.

(Rehabilitation vs Structural Weir vs Rocky Ramp)

(Unstable and Deteriorating)

Pending review of Jp2g Report and consideration by Township Council of preferred option
Summary of Preliminary Investigation

Points of Consideration

• Ownership and access issues related to property lines

• Desire for passive system – minimize active controls and inspection/maintenance requirements

• Appropriate water levels for safety and recreation while protecting health and property (downstream and upstream users)
Option Analysis

1. No Intervention
2. Rehabilitate Existing
3. Rocky Ramp
4. Structural Weir (50 m)
   A. Land Swap or Purchase
   B. On Private Property
5. Structural Weir (100 m)
Option Analysis

1. No Intervention

Pros

• Least cost
• No immediate change to lake water levels or hydraulic performance
• No construction impacts

Cons

• Does not address hydraulic issues
• Risk to public property and safety due to potential failure
• Does not address property and ownership issues
Option Analysis

2. Rehabilitate Existing Berm
Option Analysis
2. Rehabilitate Existing Berm

Pros
• Relatively inexpensive
• Little change to lake water levels or hydraulic performance
• Simplified approvals process

Cons
• Does not address hydraulic issues
• Risk to public property and safety due to potential failure
• Ongoing maintenance and inspection required
• Does not address property and ownership issues
Option Analysis

3. Rocky Ramp (Perth)
Option Analysis

3. Rocky Ramp (before)
Option Analysis
3. Rocky Ramp

Pros
• Relatively cheap over lifecycle
• Stable system with limited risk of failure
• Aesthetics
• Eco-friendly – protects fish passage and habitat

Cons
• Potentially tricky process to accurately model and design
• Regulatory approvals may be delayed due to atypical design
• Significant construction oversight required
Option Analysis

4. Structural Weir (50 m)
Option Analysis

4. Structural Weir (50 m)
Option Analysis
4. Structural Weir (50 m)

Pros

• Standard design and approval process
• Common construction process
• Predictable hydraulic performance

Cons

• Significant impacts to existing environment during construction
• Maintenance and inspection requirements
• Property and ownership issues
Option Analysis

4. Structural Weir (100 m)
Option Analysis

4. Structural Weir (100 m)
Pros

• Standard design process
• Common construction process
• Predictable hydraulic performance
• Resolves property and ownership issues

Cons

• Greater impacts to existing environment during construction
• Increased maintenance and inspection requirements
• Approvals from Conservation Authority may be contentious
• Most Expensive lifecycle costs
## Summary of Preliminary Investigation

### Points of Consideration

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addresses Stakeholder Concerns</td>
<td>The proposed intervention is likely to satisfy Bass Lake stakeholder concerns and align with the Bass Lake Management Plan.</td>
</tr>
<tr>
<td>Environmental and Ecological Protection</td>
<td>How significant are the potential impacts to the existing ecosystem and natural conditions. This would also impact the complexity and duration of regulatory approval processes.</td>
</tr>
<tr>
<td>Cost Effective</td>
<td>How much improvement relative to existing condition can be expected relative to the required investment.</td>
</tr>
<tr>
<td>Timely</td>
<td>The proposed intervention is likely to be design and constructed by the end of 2020.</td>
</tr>
<tr>
<td>Risk</td>
<td>How likely the proposed intervention is to create liability to the Township with respect to protection of the safety and property of the public.</td>
</tr>
</tbody>
</table>
Timely

• Failure of existing berm is possibly imminent
• Potential impacts to public health, safety, property, and the environment
• Construct by Fall 2020
Cost Effective

- Value for money
- Minimize *life-cycle* costs
Stakeholder Satisfaction

• Addresses residents’ concerns
  • Community buy-in
Environmental Protection

- Minimize impact to the lake’s habitat and ecosystem
  - Simplify regulatory approval process
Risk Reduction

• Remove uncertainty over ownership and responsibility
  • Minimize risk of sudden or catastrophic failure
  • Minimize liability to the involved parties
Next Steps…

Summary Report and Recommendations

1. Jp2g Summary Report detailing results of the desktop review, investigation, stakeholder consultation, and preliminary analysis to be submitted to the Township.
Next Steps…

Summary Report and Recommendations

1. Jp2g Summary Report detailing results of the desktop review, investigation, stakeholder consultation, and preliminary analysis to be submitted to the Township.

2. Township staff to review report recommendations.
Next Steps…
Summary Report and Recommendations

1. Jp2g Summary Report detailing results of the desktop review, investigation, stakeholder consultation, and preliminary analysis to be submitted to the Township.

2. Township staff to review report recommendations.

3. A new contract (if required) for the detailed design, tender, and construction oversight services for the preferred option is initiated and construction completed by end of 2020.