

## 14 ISLAND LAKE DAM – INSPECTION MEMO

**Location:** South Frontenac

**Date:** August 21, 2019 – 13:30

**Attendees:**

Brad McNevin (CAO, Quinte Conservation Authority)  
Christine McClure (Water Resource Manager, Quinte Conservation Authority)  
Kelly Maher, (Water Resources Technologist, Quinte Conservation Authority)  
Darcy Clow, (Napanee Region Field Operations Coordinator/Regulations Officer, Quinte Conservation Authority)  
Geoff Rae, (CAO, Cataraqui Region Conservation Authority)  
Mary Rae, (14 Island Lake Association, Director/President)  
Peter Peart (14 Island Lake Resident)

**Written By:** Kelly Maher

**Approved By:** Brad McNevin and Christine McClure

**Attachments:**

Map – Dam Location  
MNR Letter to Frank Babcock – 1981  
Dam Inventory Field Sheet

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This document should be read in conjunction with the July 16, 2009 report by Bryon Keene. Left and right side of the dam are determined looking downstream at the structure.

### DAM DESCRIPTION

14 Island Lake Dam is located in the Township of South Frontenac on Lot 3 in Concession 11 (see attached map). The dam is a concrete gravity structure approximately 6 feet high x 21 feet long x 5 feet wide. The sluiceway opening is 2.5 feet and is controlled by stop logs made of 2 inch lumber. From a 2007 Dam Inventory Field Sheet the purpose of the dam is listed as "Cottage, Sport Fishing, and Remote Based Tourism". On this field sheet the structure is listed as "in need of repairs". The field sheet is attached to this memo.

### CONDITION OF DAM

The date of construction of 14 Island Lake Dam is unknown however during our site visit this August it was discovered the year '1929' was carved in concrete on the left bank (**Photo 1**).

The downstream portion of the left side of the dam is in good condition. According to the 2009 Inspection Report this section was constructed in 1994 to buttress up the dam (**Photo 2, Photo 3**).

There is a noted difference between the new concrete on the downstream side of the dam and the original concrete on the upstream side. The old portion of the crest shows significant signs of heaving, voids, cracks, vegetation growth and loss of material and aggregate (**Photo 4, Photo 5**).

The gains (log opening) in the sluiceway are made of steel angle iron embedded in concrete. The visible parts of the gains above the water level are in good condition (**Photo 6**).

Within the sluiceway there is significant concrete loss and deterioration. Wet areas are noted in the sluiceway downstream which could indicate possible seepage or leakage through the concrete structure (**Photo 7**). The void in **Photo 7** on the left wall of the sluiceway was measured to be approximately 2.5 feet deep into the abutment.

The inner right wall also had signs of material loss and deterioration of concrete. Wet areas were also noted on the right side indicating possible seepage or leakage through the concrete structure (**Photo 8**).

At the interface of the right abutment to the exposed rock foundation, there is loss of material and deterioration of concrete (**Photo 9**). The large void shows exposed rebar and was measured to be approximately 2.5 feet at its opening and 4 feet deep into the weir (**Photo 10**). At the time of the 2009 inspection, seepage was noted through this connection; however no visible seepage was noted during the 2019 inspection.

The upstream side of the dam has visible debris and sedimentation (**Photo 11**). On the downstream side below the left abutment, a significant amount of debris (logs from beaver activity) is stockpiled for removal (**Photo 12**).

On the downstream face of the dam on either side of the sluiceway a horizontal crack was noted with visible efflorescence (**Photo 13**). Efflorescence is a process where salt migrates and crystalizes onto the surface of a porous material. This reaction can indicate seepage coming through the structure and should be monitored.

During the inspection two concrete pad structures were noted upstream on the left shoreline approximately 20-30 feet from the dam. One structure was submerged while a portion of the other was visible above the water line (**Photo 14**).

## OPERATION

The dam operator was not present during the inspection. A letter from the Ministry of Natural Resources dated August 18, 1981 indicated that the Fourteen Island Lake Cottagers, MNR Napanee office, and the Napanee Region Conservation Authority all agreed "that the cottagers would adopt the interim water level management program". Mr. Frank Babcock was identified as the cottagers' representative responsible for dam operations and water level management. The operation guidelines laid out in the letter (attached) are as follows:

*In order that no conflicts would arise in these arrangements, the following will be the guidelines set out for your authorization to manipulate water levels:*

- 1. The water level controls will be manipulated to improve spawning conditions for fish only as an interim management plan;*
- 2. The dam will not be altered without the prior knowledge or consent of the Ministry and for the summer period it is expected that no logs will be removed from or added to the dam and the lake level will be maintained at the present acceptable level (20 Inches below top of dam);*
- 3. In September this office (MNR, Napanee District) will instruct you to lower the lake level in prescribed amounts with the logs being replaced in the late fall*

As previously stated in the 2009 report the bay has a low capacity and the dam is overtopped during large runoff events. This was verified by residents and lake association members during the inspection. There would also be minimal potential for operation during an extreme event as the operator must walk across the top of the dam to get to the log bay. It would likely be unsafe to operate as waters would be overtopping the dam. Shoreline erosion is visible around the head pond bay. Tree roots, leaning trees, and soil loss are evident along the shoreline.

## **SUMMARY AND RECOMMENDATION**

The dam is in fair to poor condition overall. Large portions of the dam are deteriorated and should be repaired. There is no evidence of overall dam movement in rotation or sliding.

The Fourteen Island Lake Association should move forward with repairing the structure or investigating alternative options to maintain the minimum water level the dam is capable of holding back.

Rocky ramp and naturalization of the area were discussed as a possible option to maintain the current water level. This option may require multiple permits, and consultation with different levels of government. Creating a centre channel will enable fish passage and directs water away from the shoreline reducing erosion. For more information on this option please refer to information provided by Rideau Valley Conservation Authority which has recently transitioned a seasonal weir to a rocky ramp. Reference to the MNRF's Lakes and Rivers Improvement Act, as well as Department of Fisheries and Oceans permitting process is recommended.

In the 2009 report it was also mentioned that operating the dam in the fall to allow more water to be released during the spring freshet will help with shoreline erosion. To have more accurate control over the water level shorter logs could be installed giving finer control of the water level.

## Photo Library





**Photo 1: Year '1929' carved into concrete on left upstream shoreline/bank**



**Photo 2: Left abutment, downstream side - in good condition**





**Photo 3: Left abutment, downstream side - in good condition**



**Photo 4: Left abutment upstream and crest - significant voids and cracking**





**Photo 5: Left abutment void**



**Photo 6: Sluiceway, looking at the left inner wall**





**Photo 7: Sluiceway left inner wall – cracks, voids, loss of material and deterioration**



**Photo 8: Sluiceway right inner wall – cracks, voids loss of material and deterioration**





**Photo 9: Downstream view of right bedrock abutment interface**



**Photo 10: Zoomed view of downstream right bedrock abutment interface**





**Photo 11: Upstream view of reservoir debris**



**Photo 12: Downstream view of stockpiled debris from beavers**





**Photo 13: Visible horizontal crack with efflorescence**



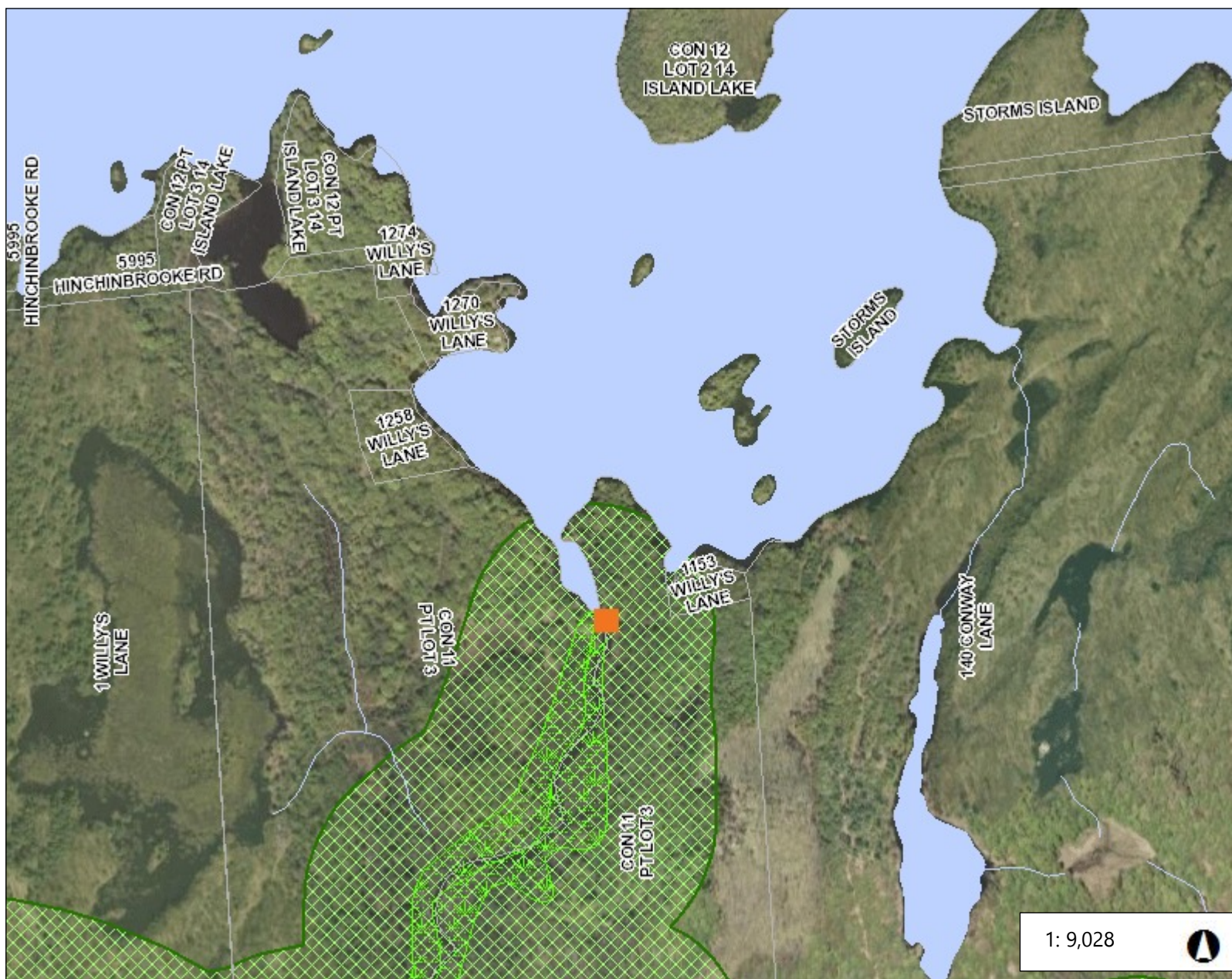
**Photo 14: Upstream concrete structures**





Photo 15: Old Photos of 14 Island Lake Dam - Year Unknown





### Legend

- Parcels
- Location Labels
- Rivers
- Waterbody
- Provincially Significant Wetland
- PSW 120m Buffer

### Notes

0.5 0 0.23 0.5 Kilometers

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
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This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION



Your file:

Our file: FOURTEEN ISLAND LAKE

1 Richmond Blvd.  
NAPANEE, Ontario  
K7R 3S3

1981.08.18

Mr. Frank Babcock  
R. R. 1  
GLENBURNIE, Ontario  
KOH 1S0

RE: WATER LEVEL CONTROL - FOURTEEN ISLAND LAKE - PORTLAND TOWNSHIP

Dear Mr. Babcock:

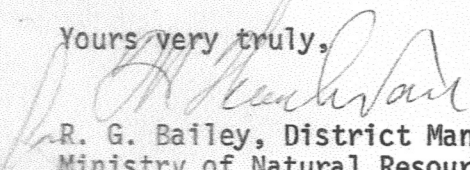
On July 8th during a recent meeting between the Fourteen Island Lake Cottagers, Alex Palilionis from the Napanee office of the Ministry of Natural Resources and John Duchene of the Napanee Region Conservation Authority all parties agreed that the cottagers would adopt the interim water level management program initiated by this Ministry last fall. Your appointment as the cottagers' representative responsible for the water level control will require a certain amount of effort on your part.

In order that no conflicts would arise in these arrangements, the following will be the guidelines set out for your authorization to manipulate water levels:

- 1) the water level controls will be manipulated to improve spawning conditions for fish only as an interim management plan;
- 2) the dam will not be altered without the prior knowledge or consent of the Ministry and for the summer period it is expected that no logs will be removed from or added to the dam and the lake level will be maintained at the present acceptable level; *20 INCHES BELOW TOP OF DAM*
- 3) in September this office will instruct you to lower the lake level in prescribed amounts with the logs being replaced in late fall.

We appreciate your assistance in this regard. Should any problems arise, please feel free to contact Alex Palilionis at the District office (354-2173).

Yours very truly,

  
R. G. Bailey, District Manager  
Ministry of Natural Resources  
Napanee District

A.P. PALILIONIS:ra  
CC:Lands, Napanee  
CC:J. Duchene, Napanee Region Conservation Authority



# Dam Inventory Field Sheet

Date:	Investigators:	
Other:	Easting: <b>369060</b>	Accuracy:
	Northing: <b>4927092</b>	Elevation:

**Site Description and Map** *Draw a map of the site (with landmarks) and/or attach photographs.*

(Indicate North)



## 3.1 Dam Ownership and Location:

Source Protection Region: <b>Quinte Region</b>	Name of CA: <b>Quinte Conservation Authority Napanee Region Watershed</b>
Name of Dam: <b>14 Island Lake</b>	
Name of Watercourse:	
Dam Owner: <b>na</b>	Dam Operator: <b>na</b>
Dam Maintained by: <b>na</b>	
Location of Dam (Township): <b>South Frontenac</b>	
Address (street and number):	
Location of Dam (Lot, Concession): <b>Lot 3, Con 11</b>	

## 3.2 Purpose of Dam (Identify primary purposes and mark secondary purposes):

*(circle one as primary)*

Flood Control	Conservation/ Wetland Preservation	Stormwater Management
Waterpower	Amusement Park/ Historical Site	Low Flow Augmentation
Fire Supply	Municipal/ Domestic Intake	Agricultural Irrigation
Navigation	Livestock Watering	Mine Tailings

**Recreation- Cottage, Sport Fishing, Remote Based Tourism**

Other (please describe):

*(state secondary purposes if any):*

**3.3 Type of Dam** (circle one)(see field book for pictures and descriptions):

Concrete Arch	Concrete Buttress	Concrete Gravity	<b>Concrete Weir</b>
Concrete/ Steel Sheet Pile or Earth Filled Dam		Rockfilled Weir	Masonry
Rockfill with Concrete Facing or Upstream Earthfilled Core		Steel Sheet Piling	
Stone-filled Timber Cribbs or Sheet-Pile Core		Earth Filled Embankment	
Other (please describe):			

**3.4 Outlet/ Discharge Type** (circle one)(see field book for pictures and descriptions):

<b>Uncontrolled Spillway (free running)</b>	Drop Inlet (steel/ concrete)
Controlled Spillway (stop logs)	Controlled Spillway (steel gates)
Pipe, Conduit, Culvert (steel, concrete, plastic)	Fishway
Other (please describe):	

**3.5 Type of Foundation** (check downstream for clues ie:Bedrock):

**overburden**

**3.6 Year of Construction** (circle one category):

Prior to 1950	1970-1979	After 2000
1950-1959	1980-1989	Exact Date (if known):
1960-1969	1990-1999	

**3.7 Dam Dimensions** (height and length in meters):

Height (streambed to crest on downstream side):

Length or Span (bank to bank):

**3.8 Surface Area of Reservoir** (circle one)

Less than 2 hectares

Between 2 and 6 hectares

**Greater than 6 hectares**

Actual Area (if known):

**Additional Information****3.9 General Visual Appearance of the Dam** (comment on general appearance of dam but not structural condition of the dam):

**Strucure is in need of repairs.**

**3.91 Most Recent Repair Work And The Year In Which It Was Done:**

**1990's**

**3.92 Additional Notes/ Comments:**