



# **The Appleton Wetland; Its Decline, Cause and Recommended Action**

## **Appendix E: Analysis of Weir Photographs**

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## **Analysis of Weir Photographs**

We attempted to collect as many photographs as possible to determine changes that might account for the apparent changes in river level between the Flour Mill Era and the Generator Station Era. A key item in that was determining the exact height of the concrete weir and flashboards and the state of repair of the boards. Unfortunately photographs specifically for that purpose are rare – until recently no one was particularly interested in the topic and those photos were probably never taken. Photographs that do exist were taken of other more interesting views, and if the weir was included it was more by accident than design. As a consequence what can be seen of the weir and flashboards in such images is difficult to quantify in terms of flashboard height. The material that follows includes the best of what is available, and is divided into two sections, one for each of the eras.

### **Flour Mill Era**

One source of historic images is the Michael Dunn collection of Historic Photos now available on the following website:

[http://www.almonte.com/historic/page\\_0001.html](http://www.almonte.com/historic/page_0001.html)

Historic images have also been obtained from Robert Newton. They are the result of background research that he did for the production of two videos on Almonte history. In addition, a member of the Research Group (Al Seaman) has provided photos. A problem with most of the images is that we lack the precise date and circumstances around their origin. However, they still represent a sample of what happened at some time in that era. In the pages that follow, a selection of the most useful images is included along with some commentary on the features of each image.

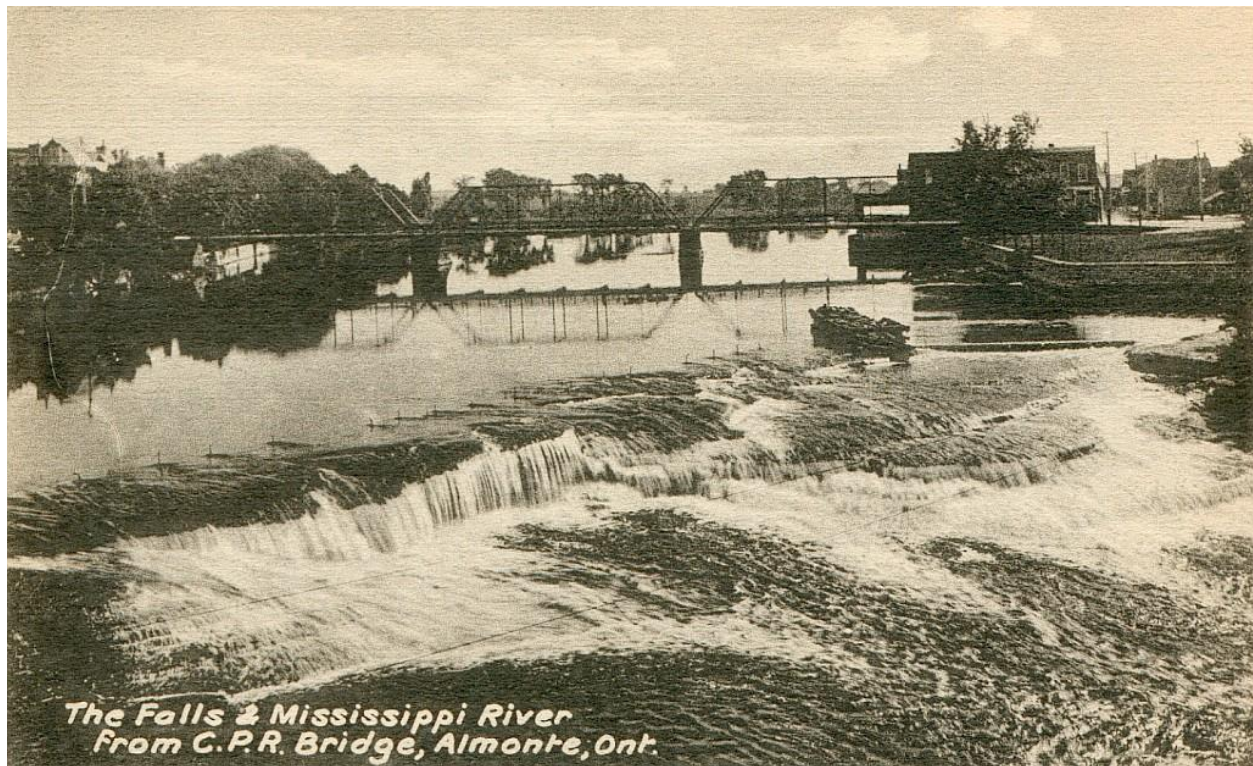


Figure E-1 Newton “upper falls.tif”

This image was provided by Robert Newton and is undated. To the right of the rock crib in the river is something that looks very much like the concrete weir section 1 that exists today. The trees have leaves on them, so it is summer and the water level is low – about the top of the section 1 weir. To the left of the rock crib is a row of pipes protruding above the water in about the location of the current weir section 2, although it does not appear that an actual weir section was in place then. The pipes were probably anchored in the rock shelf and were used to support flashboards. There is no evidence of flashboards on either of these two sections.



**Figure E-2 Dunn “upper\_falls\_towards\_lower\_falls.jpg”**

This image from the Michael Dunn collection is undated. The river is at flood stage, and judging from the emerging leaves on the trees, it is spring time. There is no evidence of flashboards, which is normal since they get broken off during flood stage. The straight edge of the falls at the right side of the image is an indication that weir section 3 is under the water.



Figure E-3 Dunn “tinted\_view\_of\_cpr\_bridge\_towards\_town\_hall.jpg”

This image from the Michael Dunn collection is undated. There is some evidence of snow on the ground but no ice on the river – the picture was probably taken in November. As in the case of Figure E-1, there is no indication of flashboards anywhere, and in addition there is no sign of projecting pipes for supporting flashboards. The concrete weir section 1 can be seen across from the Old Town Hall, and the straight edge of the falls leading from the CPR bridge indicates the presence of weir section 3. A copy of this image has also been found on a postcard bearing a 1912 postmark indicating the photograph was probably taken within a few years prior to that date.





**Figure E-4 Dunn “train\_wreck\_1974\_no2.jpg”**

This image is from the Michael Dunn collection and can be dated as very shortly after the train wreck of June 5, 1974.

From the website at URL:

<http://www.railways.incanada.net/circle/Wreck%20Details/1974Almonte.html>

“1974, June 5 - Eastbound freight train #76 derailed the last 16 cars of its 73-car train at Almonte. The cars ended up over the bridge into the Mississippi River, and hit the flour mill at the highway 44 crossing.”

Environment Canada records show the river flow rate in 1974 was 57 cms on June 5 declining steadily to 25 cms on June 12. The general appearance of the falls is in accord with that range of flows, and the appearance of the water going over weir section 3 suggests that flashboards were present on the weir. The water level at the junction of weir section 3 and the fourth pier of the bridge is consistent with the flashboard height being 12 inches as indicated by others as the board height used in the Flour Mill Era.



**Figure E-5 Seaman "AlScan604Nov73.jpg"**

This image by Al Seaman was included in a set of negatives of the Old Town Hall. The negative index was marked November 1973. The negative was scanned to produce the above digital image. There is a trace of snow on the ground, but no ice on the river suggesting that the image was taken in the second half of November. The image also shows the weir sections 1 through 3. There is definitely the appearance of flashboards on weir section 3 as shown by the pipe supports and the very sharp and straight edge of the waterline along the flashboards. Additional analysis of this image is contained in Figures E-6 through E-8 that follow.



**Figure E-6 Seaman “CompositeNov73e.jpg”**

This image is a composite that combines crops from three separate images for comparison purposes. The top image is an enlarged crop from Figure E-5 above. The middle portion is a cropped enlargement from an image taken during the summer of 2013 when there were no flashboards on weir sections 1 and 2. The bottom portion is another cropped enlargement taken during the summer of 2012 when the flashboards on sections 1 and 2 were fully intact and 50 cm in height. The two reference photos were taken from very similar view points on the CPR bridge. The top image was taken from a slightly different location that is no longer accessible due to a dense growth of brush in the passing years. The top image looks more like the no-boards middle image, although the differences in flow rate and perspective make that comparison difficult. The bottom image certainly indicates that if there are flashboards in the top image, they are much lower than 50 cm in height.





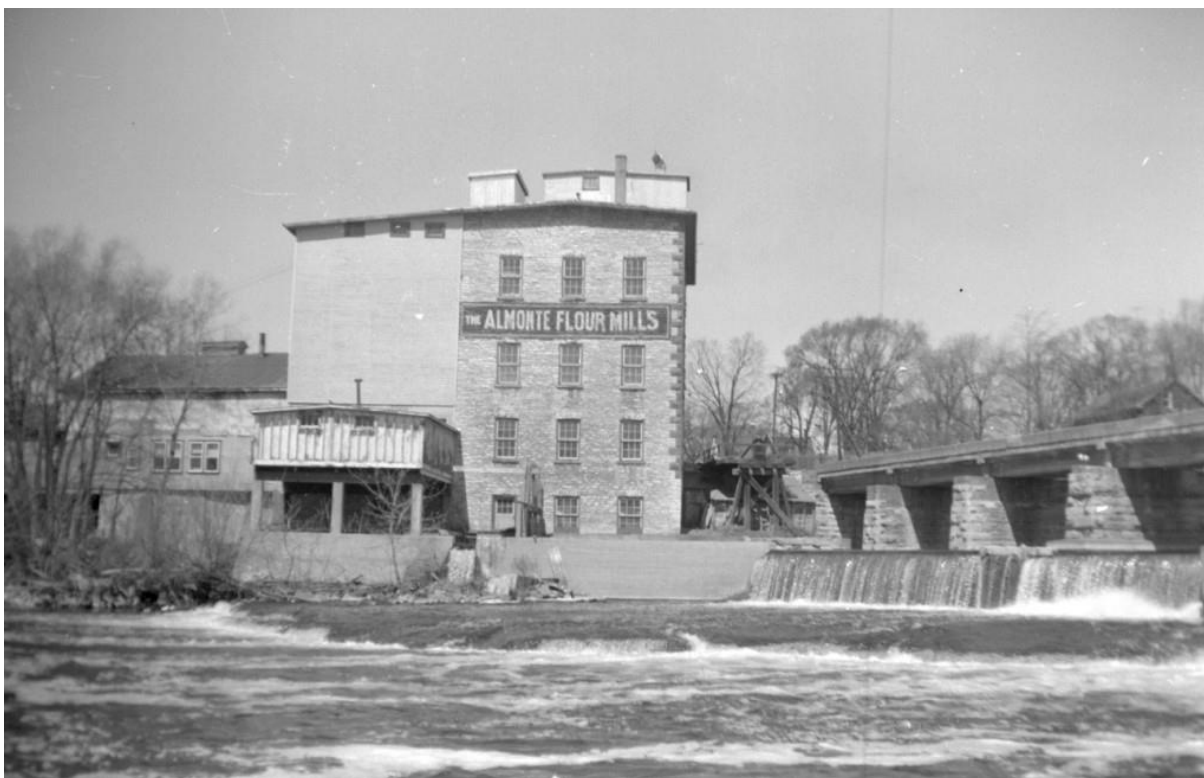
**Figure E-7 Seaman “Composite2Nov73e.jpg”**

This image is a composite that combines crops from two separate images for comparison purposes. The top image is an enlarged crop from Figure E-5 above. The bottom image is a cropped enlargement from an image taken during the summer of 2013. Both show the junction of flashboard on weir section 3 with pier 4 of the CPR bridge. In the top image, the clear line of the top of the flashboards meets the point of the fourth pier in the centre of the circle at the level of the top of the pier. In the lower image the current flashboards meet the pier at a point that is further back from the tip of the weir, and the boards extend above the top of the weir. The height difference looks consistent with the 12 inch (30.5 cm) boards claimed in that era compared to 40 cm boards of today as used on weir section 3.



**Figure E-8 Seaman “AlScan604Nov73e2.jpg”**

This image is a cropped enlargement of a section of Figure E-5 showing the junction of weir sections 2 and 3. It is a bit difficult to define exactly the state of section 2, but it does appear that at the junction the flashboards on section 3 are higher than on section 2. That may be the result of missing boards or shorter boards. If the latter, it contradicts claims that section 2 had 14 inch boards while section 3 had 12 inch boards in this Era.



**Figure E-9 Newton "rear view of flour mill.tif"**

This image from Robert Newton is undated. From the appearance of the trees it seems to be early May with the leaves just starting to emerge. The spring flood has passed but flow rate is still quite high. On careful inspection, it can be seen that there is a short section of flashboards still on weir section 4 that was not broken off in the spring flood. This provides an opportunity for further estimation of flashboard height.



**Figure E-10 Seaman-Newton “rear view of flour mill-crop.jpg”**

This image is an enlarged crop from the previous Figure E-9, and shows a bit more clearly the remnant of flashboards on weir section 4. The next image, Figure E-11, shows this weir in 2012 with its flashboards having a confirmed height of 40 cm. Fortunately, both images have flashboards and the concrete weir in the same vertical plane. By measuring the pixel positions for the top of the boards, the junction of the boards and the weir, and the bottom of the weir in both digital images, the historic board height can be calculated. The weir height provides the image scale for each image, and the known 40 cm height of the current flashboard provides the calibration for the calculation. Since the measured points are in the same vertical plane, the measurements are not overly sensitive to differences in perspective or view point location. The results of several measurements on the images yield a board height consistently near 30 cm, equivalent to the 12 inch height claimed for the boards in this era.

Although this appears to be an image from early May and after the spring flood in some unknown year, we have no event context. It may be a remnant left after the most recent flood and before flashboards were all replaced later in that spring. On the other hand it may have been a remnant from several years before after a period in which no flashboard maintenance was done.





**Figure E-11 Seaman “189\_8924e.jpg”**

This image was taken during the summer of 2012 and shows weir section 4 with flashboards on top. The boards have a stated height of 40 cm, and this image has been used as a reference to provide flashboard dimensions from other images taken at different times. The approach is described in the description following Figure E-10.

## Generator Station Era



**Figure E-12 Seaman “GazetteMill1992-IMG\_0562.jpg”**

This image was discovered in the 1992-10-21 issue of the Almonte Gazette showing the Flour Mill and weir section 4. Since this was a half tone printed view of the original photo, and it has since been microfilmed, and then photographed from the screen of a microfilm viewer, image quality is very poor. It is very difficult to accurately determine the position of the junction between concrete weir and flashboards, and the position of the bottom of the weir. The result is that attempts to estimate flashboard height using Figure E-11 as a reference produce very erratic results ranging from 30 to 50 cm. The most that can be confirmed is that flashboards were in place in 1992 near the start of the Generator Station Era.





**Figure E-13 Fahie “18AP-Flour\_Mill\_10x8\_80dpi.jpg”**

This image was provided by Steve Fahie and is dated August 10, 2002. It is a crop from a larger image. Using previously mentioned measuring techniques in conjunction with Figure E-11 as a reference, flashboard height was determined to be very close to 40 cm in this image.



**Figure E-14** Caughey “DSCF0491 2001-05-31.jpg”

This image was provided by Mike Caughey and is dated May 31, 2001. Using previously mentioned measuring techniques in conjunction with Figure E-11 as a reference, flashboard height was determined to be very close to 40 cm in this image. This is the earliest solid confirmation that higher flashboards were in use after conversion of the old mill to power production.





**Figure E-15 MNR “Flashboards 6.jpg”**



**Figure E-16 Seaman “189\_8962e2.jpg”**



**Figure E-17 Seaman-MNR “Flashboards 6e.jpg”**

The Figure E-15 was included in an email to the SAC by Jim Fraser of MNR and is dated on the image as November 15, 2001. The Figure E-16, taken July 12, 2012, is the closest image on hand that was taken from a similar view point and suitable for comparison. Unfortunately there are no vertical features in the same plane as the flashboards, so the technique used previously is not applicable. In addition since the view points are different, the two images are not directly comparable. The best option was to crop selected portions of the flashboards along with a short section of the rocks below from the 2012 image and overlay them on the 2001 image. After

adjusting the position and scale of the rocks on the cropped images to match the same rocks in the 2001 image, the flashboard portions of the cropped images are in line with the size and position of the boards in the 2001 image. The conclusion is that in 2001 the flashboards on weir sections 1 and 2 were the same as in 2012 – that is, 50 cm. That is consistent with the findings of MNR for this image.

## **Conclusion**

The historic record of the weir and flashboards in photographs is quite contradictory. There is evidence that the concrete weir has been there a long time, perhaps over a hundred years. The use of flashboards is less certain. Early images such as Figure E-1 and Figure E-3 have no flashboards, although Figure E-1 does show the pipe supports that would anchor flashboards. Those are undated images, probably dating back to the early 1900s. More recently Figure E-4 in 1974 does appear to have flashboards on section 3 of 12 inch height. Figure E-5 in 1973 also appears to have 12 inch boards on section 3, but those on sections 1 and 2 seem to be shorter or partially missing. Figure E-9 is undated, but may be around 1950, and clearly shows a lot of missing boards on section 4 along with a short remnant that can be measured as 12 inch. There are no photographs in the Flour Mill Era that we have found that clearly show all flashboard sections in place at one time, and of a quality that permits accurate size estimation.

On the other hand during the Generator Station Era, there is very clear photographic evidence that boards heights of 50 cm were used on sections 1 and 2, and 40 cm boards were used on sections 3 and 4 as early as 2001. Around the beginning of this era (1990) when the GS was still using the old turbines and generators, the flashboards, if any, were probably the lower boards of the Flour Mill Era. There was a period around 1995 when the plant was idle while a new water intake and tailrace were built and the turbines and generators were replaced. Subsequently, around 1997 current operations as a GS began. It is not clear just when in the 1997 to 2001 interval that the flashboard height was increased.

The photographs also suggest a change in purpose for the weir and flashboards in the two eras. In the first period, the purpose seemed to be divide the available water and direct it to the Flour Mill and the Thoburn Mill while preventing an undue amount of water from escaping over the falls. In the second period, the purpose is clearly to maximize the head for the GS and so generate more power and revenue.