

APPENDIX 14

RELATIONSHIPS OF AREA WATERCOURSES

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ENGINEER'S UNDERSTANDING OF THE RELATIONSHIP OF THE NOTTAWASAGA RIVER, WILLOW CREEK, MUSKRAT CREEK, SWALEY DRAIN AND DOWNEY DRAIN SINCE THE EARLY 1900'S TO THE CURRENT TIME

The data on file and as already discussed herein indicates that initially there were two creeks in the study area with outlet into the Nottawasaga River. One was the Willow Creek and the other was the Muskrat Creek. It is also evident from the correspondence in the file that the original Swaley Drain was known as the Swaley Creek and it outletted into the Muskrat Creek, perhaps near the original 1898 outlet although this documentation was not found.

It is suspected that substantial tree cover existed along the route of the Willow Creek and the Muskrat Creek even in the original period of drainage reports since the 1901 reports talk about the necessity of removing fallen trees from the Muskrat Creek and a 2013 document that was reviewed by the Engineer talks of 60 years of forest decline in the Minesing wetlands.

It is evident from this Engineer's survey work and from the survey work of others that the channel bottom gradient of the original Muskrat Creek and of the Willow Creek from the Nottawasaga River upstream is minimal. It would appear that gradients in the range of 0.02% only have existed throughout.

It is this Engineer's conclusion that when the original Swaley Creek drainage was constructed as per the Gaviller report of 1898 with an outlet near the 11th Line, that the outlet perhaps at the time of survey was found acceptable. However shortly after, it was found not acceptable (due to fallen trees, etc. in the Muskrat and due even then to an inappropriate and temporary connection with Willow Creek) and thus the reason the Engineer had to make further reportings in the 1901 period to extend the Swaley outlet to the Muskrat Creek three quarters of the way across Lot 10, Concession 11 and to improve Muskrat Creek so that this new Swaley Creek Drainage could function. Specifically, it is noted that work had to be done at the junction of the Muskrat Creek and the River (the "cut") and fallen tree removal had to be done in the Muskrat upstream.

It is this Engineer's belief that this work in the Muskrat then served to outlet the Swaley Drain satisfactorily until the period of the 1930's. It is not known what led to the construction of the government ditch in the 1930's or to the failed Engineer's Report of the 1930's (both of which are now discussed in **Appendix 2** of this Report) but it is this Engineer's opinion that the work in the 1930's must have been done to provide an alternate or replacement watercourse for the Muskrat Creek for 2,000m± east of the Nottawasaga River. Also it is this Engineer's opinion that the work done in the 1930's

desired a lower outlet elevation in the Nottawasaga River and it was for this reason that the government ditch started 2000m± downstream (following the river course) of where the Muskrat originally outletted into the River.

It is not known whether the Engineer's Report of the 1930's was not proceeded with because of objections from and/or agreements by the landowners, and/or because it became known that work that had or was supposed to be constructed by the government. Perhaps the government ditch was constructed because of the failure of the 1930's report. This Engineer's opinion, however, is that the work of the 1930's must have sufficiently outletted and/or replaced the Muskrat Creek across Concession 12 that the Muskrat Creek up to the Swaley Drain and the Swaley Drain itself functioned sufficiently.

As has been noted, the outlet of the Tracey Davis Award Drain was given a new outlet in the government ditch by the construction of a ditch privately or perhaps even by the government program as well. This ditch has been called the Coleman Ditch, and it parallels much of the original Muskrat Creek route across Lot 7, Concession 12. This channel no doubt would have been a further and improved outlet for Muskrat Creek waters, in addition to the improved outlet for the Muskrat Creek waters into the main government ditch from the River across Concession 12.

In 1948 there was another Engineer's report obtained to improve the Swaley Drain. It is not known why the report's work in 1948 did not also pursue an improved outlet for the Swaley Drain further downstream but it was perhaps (as has been described) because the 1930's ditch still provided an outlet and/or perhaps it was because it was known that further works were planned on the government ditch.

Indeed, in 1961, the government ditch was repaired, improved and incorporated as the Downey Drain by a report of D. E. Wier, P.Eng. As has been noted, the undersigned Engineer questions why the Downey Drain did not recognize the full watershed of the Tracy Davis Award Drain and why it did not recognize the watershed of the Muskrat Creek including the Swaley Drain since it should have been known that those waters did outlet into the government ditch and thus the new Downey Drain.

It is not known whether the outlet change in the Swaley Drain that occurred between 1954 and 1989 as evident from aerials, occurred because of a natural migration of Muskrat Creek or because of deposition of sediments from Willow Creek when it temporarily breached its banks to the Muskrat/Swaley during the Hurricane Hazel event.

It is evident from a review of aerial photography that, in part, at some time before 1954, and then, in balance, in the period of 1954 to 1989, Willow Creek was altered by man-

made construction from Lot 12, Concession 11 upstream into Lot 10, Concession 9 over a length of 3,000± metres. (See also **Appendix 13** discussing the Willow Creek.)

This aerial coverage also shows the route of a channel that was excavated on Lot 10, Concession 10 (in the area between the Swaley Drain and Willow Creek routes), sometime in this same period. This channel is believed to have been excavated to provide better drainage on Lot 10, Concession 10 into the Swaley. However, it is understood when the Hurricane Hazel storm caused the Willow Creek bank to be breached, the Willow Creek waters entered this channel and ran to the Swaley.

Perhaps the work re the Willow, and then due to its sediment discharge into the Swaley, contributed to the route change of the Muskrat and then maintenance on the Swaley tried to outlet into a re-routed location of the Muskrat.

It is this Engineer's belief that sediments do exist at the current outlet of the Swaley and such combine with the dense wetland vegetation to be the factor for the significant rise in wetlands water levels in the 900 to 1000m length downstream of the current outlet. As stated, this Engineer believes that any works to improve the Swaley outlet should bypass this existing outlet area, and should try to follow the historic routes of the Swaley Drain and Muskrat and thus create a shorter new route across the Minesing Wetlands. The new Swaley work could however also extend through the wetlands in line with its existing course if desired with a new outlet at the same location.

It is not known why there was no work undertaken in the 1970's downstream of the Swaley outlet as it exists now. Perhaps there was but such is not evident. Perhaps the work that was done on the Downey Drain in the 1960's still provided a sufficient improved outlet for the Muskrat and thus the Swaley waters.

The files do not have any documentation that was made available to the Engineer as to events from the 1970's through to the early 2000's period but it is believed that works of repair occurred in the 1980's period based on data from the Municipality. Upstream work then occurred in the 2000's based on communication between the Municipal Drainage Superintendent at the time and the Conservation Authority and due to the preparation of a new maintenance schedule in 2003.

There is evidence in the file that in 2013, an Ontario Land Surveyor from Barrie was commissioned to do a survey from the outlet of the Swaley Drain¹ down to the Downey Drain generally along the route that would involve the Coleman ditch in part and then along the route that this Engineer examined as one option in his Scoping Report.

¹ *This land surveyor's work actually commenced further upstream in the Swaley at Vespra Valley Road.*

However, work did not proceed subsequent to this Engineer's 2013 survey since landowners were advised that if work were to be implemented, it would have to be by petition pursuant to the Drainage Act.

There is no evidence in the documentation available to the Engineer as to how the lands traversed by the Muskrat Creek, and the Willow Creek in Concessions 11, 12 and part of 13, changed from the 1900's through to the 1970's so as to impact drainage such that these creeks lost what ability they did have to serve as sufficient outlets for upstream waters. Perhaps it was/is because of the severe and lengthy flooding of the lands by the Nottawasaga River, perhaps because of the levees that have developed along the River and elsewhere associated with this flooding and blocked off the Muskrat, perhaps because of rising of normal water levels in the River, perhaps because of the resulting growth of wetland grasses, or perhaps the cause is a combination of all of these plus other factors.

No doubt the resultant increase in development of wetland areas led to the studies in the 1970's to acquire the flooded/wetted lands and to create what is now known as the Minesing Wetlands in the ownership of the province. The lands now comprising the Minesing Wetlands were privately owned until the 1970's based on data reviewed. As private ownership of the wetlands area declined and as government ownership increased with the intent of ensuring a wetlands existed, the wish to ensure that the area drained to the River at least equal to what existed originally would naturally decline.

It is not known when the levees that exist now along the Nottawasaga River in the Study area developed, but such levees do not allow the Muskrat to easily outlet into the River. These levees cause the Muskrat Creek remnants in this Engineer's opinion to overflow and outlet to the Downey Drain prior to building up to a point where they would overflow the levy and enter into the River. Indeed, some of the elevations the Engineer secured suggest there may be a continuous outlet through the bush near the Concession 12-13 line for the wetland waters above the old Muskrat to the Downey. It is also reported that levees have developed along the Willow Creek upstream of the River.

It has been noted that there is a wish by some owners of the privately owned lands that still remain between George Johnston Road (the 10th Line/County Road 28) and the River to provide an improved outlet to the Muskrat Creek remnant's waters. One of the owners indeed suggested the Downey Drain should be considered rather than the River. As well, there was, during the Scoping Study period, an expressed reluctance of the NVCA to alter the levees along the River or to do any work in the River.